

Краснодарский университет МВД России

**КОМПЬЮТЕРНЫЕ ТЕХНОЛОГИИ  
И КИБЕРТЕРРОРИЗМ**

**COMPUTER TECHNOLOGIES  
AND CYBERTERRORISM**

Учебное пособие  
по английскому языку

Краснодар  
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Для курсантов и слушателей образовательных организаций МВД России.

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## **Introduction**

### **Введение**

Методическая организация учебного пособия, предусматривает выполнение целевых установок программы – научить будущих профессионалов – сотрудников полиции понимать и обсуждать литературу, связанную со всеми аспектами информационных технологий, и направленную на борьбу с терроризмом в киберпространстве, воспринимать на слух иноязычную речь и объясняться в определенных ситуациях профессионального характера на изучаемом языке по данной теме.

На одном тематическом материале, комплексно-дифференцированно осуществляется развитие умений и навыков устной речи, чтения и письма. Методическая система учебного пособия предоставляет возможность освоить учебный материал поэтапно – от просто к сложному. Изучаются тематические лексические единицы, которые находят отражение в базовых текстах. После работы над текстом даются грамматические правила, освоение и закрепление которых осуществляется посредством упражнений для обучающихся разного уровня. Каждый раздел пособия завершает сборник текстов из оригинальных источников для самостоятельного, более глубокого изучения профессионально-ориентированного материала. В приложения включены тесты для самоконтроля, краткий тематический англо-русский словарь, англо-английский словарь терминов киберпространства, а также перечень вопросов, который может быть использован как при составлении диалогов, так и при подготовке сдачи промежуточной аттестации.

Учебное пособие «Компьютерные технологии и кибертерроризм» предполагает взаимосвязанное прохождение лексического и грамматического материала и развитие речевых умений и навыков. Каждый раздел пособия включает, как аутентичные, так и адаптированные

учебные, профессионально ориентированные тексты, лексико-грамматические комментарии и упражнения. Для будущих сотрудников ОВД в сфере безопасности информационных технологий представляется необходимым овладение всеми видами чтения литературы по специальности на английском языке с целью получения профессионально значимой информации, т. к. при решении ряда профессиональных задач как вид речевой деятельности чтение широко востребовано.

Особое внимание уделено разделам, которые содержат лексико-грамматические единицы, введённые в предыдущих разделах, что снимает сложности в активизации новых единиц. Упражнений и различные задания стимулируют освоение навыков речевой коммуникации, как в устной, так и письменной.

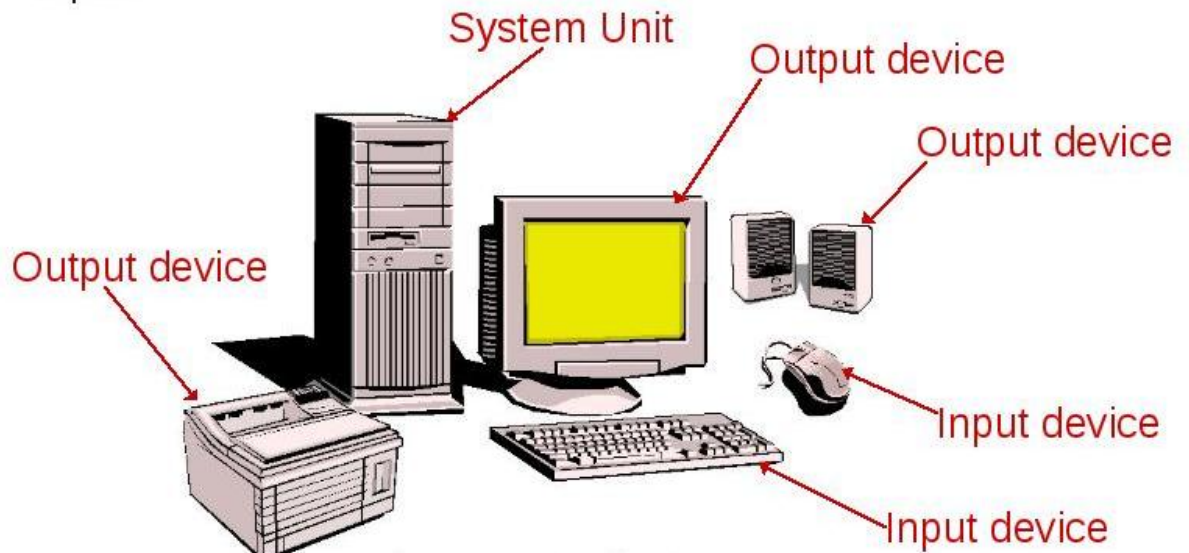
*Материал приложений (тесты для самоконтроля, вопросы к экзамену, а также краткие тематические словари, новости по проблемным темам и кроссворды)* предназначен для самоконтроля и саморазвития слушателей.

Представленные в пособии аутентичные тексты на английском языке углубляют знания обучающихся специальности Безопасность информационных технологий в правоохранительной сфере, знакомят их с современным английским языком, расширяют представления о компьютерных технологиях прошлого, настоящего и планируемого будущего, а также информируют об имеющихся кибератаках и способах их предотвращения и могут быть использованы профессорско-преподавательским составом, адъюнктами, курсантами и слушателями образовательных организаций МВД России как для работы в аудитории, так и для самоконтроля.

## UNIT I COMPUTER SYSTEMS:

definition, history, types, application

# Computer Systems



## Unit I COMPUTER SYSTEMS

### Vocabulary



*Study the vocabulary and learn the words*

1. **authenticate** O [C] подтвердить личность (подлинность) пользователя компьютера; E.g.: *Admittance was denied when the computer could not authenticate him.* С греч. *authentikos* (подлинный).
2. **boot** O [D] запустить компьютер. *Сокращение от bootstrap.*

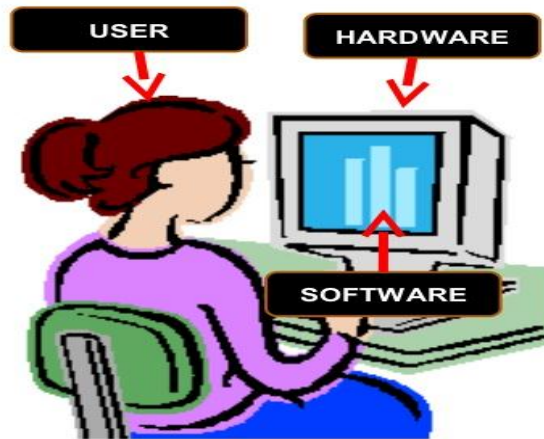
3. **browser** О [А] браузер - Программное обеспечение, которое позволяет вам исследовать или просматривать Интернет. от фр. brouter (пстись, кормиться).
4. **compress** О [А] сжимать; хранить данные в меньшем количестве места ; E.g.: *The manuscript was compressed on a single floppy disk.* Со старо-фр. compressor.
5. **cracker** О [В] взломщик; Злоумышленник; кто-то, кто взломал или взломал компьютерные системы; E.g.: *In the film Mission: Impossible, Tom Cruise enters a high-security area with the aid of a cracker.* С нем. krachen
6. **cursor** О [В] курсор; подвижный индикатор на экране компьютера; E.g.: *He put the cursor after the last typed word.* С лат. (бегать).
7. **download** О [А] скачать; скопировать файл или программу на персональный компьютер; E.g.: *She downloaded the transcript of the trial.* С др.англ. adune (с холма) and lad (несущий).
8. **emoticon** О [D] смайлик; Иллюстрация, передающая настроение;; E.g.: *When viewed sideways, the emoticon :-) signifies happiness.* Also called smiley. Derived from emotion and icon.
9. **gigabyte** О [В] гигабайт; Единица хранения; E.g.: *A gigabyte of work was saved on her home computer.* С греч. gigas (гигант) и варианта бита (сокращение от for binary digit- двоичной цифры).
10. **glitch** О [С] глюк; Ошибка; неисправность; E.g.: *A telecommunications glitch nearly wiped out the stockbroker's on-line trading.*
11. **hit** О [D] Посетить веб-сайт. С древне-скандинавского hitta (встречаться с кем-либо).



- 12.**link** О [C] ссылка; относящийся к сайту в интернете; E.g.: *One link sent him from Caruso to Pavarotti.* С нем. Gelenk (присоединённый).
- 13.**log on** О [B] войти в систему; получить доступ к компьютерной сети; E.g.: *A user ID and password will help you log on.* Origin unknown.
- 14.**modem** О [D] модем, Подключающее устройство между компьютерами по телефонной линии; E.g.: *The journalist submitted her article by modem.* Condensed form of modulator and demodulator.
- 15.**network** О [C] сеть, Система электронно-объединенных компьютеров; E.g.: *A network offers many opportunities for sharing information.* С др.-англ. nett (узел) and weorc (действие).
- 16.**pixel** О [A] пиксель, элемент изображения; основная единица экранного изображения . Сокращение от pix и element.
- 17.**scanner** О [A] Machine that reproduces images onto a computer. Latin scandere (to climb).
- 18.**server** О [A] сервер, Машина, которая воспроизводит изображения на компьютер Central computer sharing resources and data with other computers on a network. С лат. servire (быть в использовании).
- 19.**shareware** О [D] Бесплатное пробное программное обеспечение, часто требующее более поздней оплаты. Combination of share and software.
- 20.**virus** О [D] вирус, цифровая инфекция; as, *The virus wreaked havoc with the bank's accounting.* С лат..

## *Read and translate*

### DEFINITION COMPUTER SYSTEM



- A computer system is defined as **combination of components designed to process data and store files.**
- A computer system requires **hardware, software** and a **user** to fully function.

## **1. COMPUTER SYSTEMS**

Computers can be divided into 3 main types, depending on their size and power.

The largest and most powerful are Mainframe computers. They can handle large amounts of information very quickly and can be used by many people at the same time. They usually fill a whole room and are sometimes referred to as mainframes or computer installations. They are found in large institutions like universities and government departments.

Minicomputers, commonly known as minis, are smaller and less powerful than mainframes. They are about the size of an office desk and are usually found in banks and offices. They are becoming less popular as microcomputers improve.

Microcomputers, commonly known as micros, are the smallest and least powerful. They are about the size of a typewriter. They can handle smaller amounts of information at a time and are slower than the other two types. They are ideal for use as home computers and are also used in education and business. More powerful microcomputers are gradually being produced; therefore, they are becoming the most commonly used type of computers.

A computer can do very little until it is given some information. This is known as the input and usually consists of a program and some data.

A program is a set of instructions, written in a special computer language, telling the computer what operations and processes have to be carried out and in what order they should be done. Data, however, is the particular information that has to be processed by the computer, *e.g.* numbers, names, measurements. Data brought out of the computer is known as the output.

PROGRAM Add two numbers then display the result.

OUTPUT DATA 7

INPUT DATA 3, 4

EXAMPLE: A computer calculating  $3 + 4 = 7$  uses the following program and data:

When a program is run, *i.e.* put into operation, the computer executes the program step by step to process the data. The same program can be used with different sets of data.

Information in the form of programs and data is called software, but the pieces of equipment making up the computer system are known as hardware.

The most important item of hardware is the CPU (Central Processing Unit). This is the electronic unit at the center of the computer system. It contains the processor and the main memory. The processor is the brain of the computer. It does all the processing and controls all the other devices in the computer system. The main memory is the part of the computer where programs and data being used by the processor can be stored. However, it only stores information while the computer is switched on and it has a limited capacity.

All the other devices in the computer system, which can be connected to the CPU, are known as peripherals. These include input devices, output devices and storage devices.

An input device is a peripheral, which enables information to be fed into the computer. The most commonly used input device is a keyboard, similar to a typewriter keyboard.

An output device is a peripheral, which enables information to be brought out of the computer, usually to display the processed data. The most

commonly used output device is a specially adapted television known as a monitor or VDU (Visual Display Unit). Another common output device is a printer. This prints the output of the CPU onto paper.

A storage device is a peripheral used for the permanent storage of information. It has a much greater capacity than the main memory and commonly uses magnetic tape or magnetic disks as the storage medium.

These are the main pieces of hardware of any computer system whether a small “micro” or a large mainframe system.

# Computer Systems

- **A computer program is...**
  - A set of instructions for a computer to follow.
- **Computer software is ...**
  - The collection of programs used by a computer
- **Computer hardware is ...**
  - The actual physical machines that make up a computer installation.

Hardware	Software
<ul style="list-style-type: none"> <li>• Things that can be touched are called “Hardware”.</li> <li>• <u>Characteristics:</u> They have physical existence, weight, color &amp; they can be damaged or broken.</li> <li>• E.g. monitor, mouse, printer.</li> </ul>	<ul style="list-style-type: none"> <li>• The parts that can’t be touched are called “Software”.</li> <li>• <u>Characteristics:</u> It has no physical existence.</li> <li>• They can be realized through mind and feeling <i>only</i>.</li> <li>• E.g. translators, editors, programs.</li> </ul>

## EXERCISES

### I. Answer the following questions:



## Questions and Answers

1. What type of computer is most suitable for home use?
2. What is a program?
3. What are the functions of main memory, input device, storage device?
4. What is data?
5. What are the functions of processor, output device, monitor?

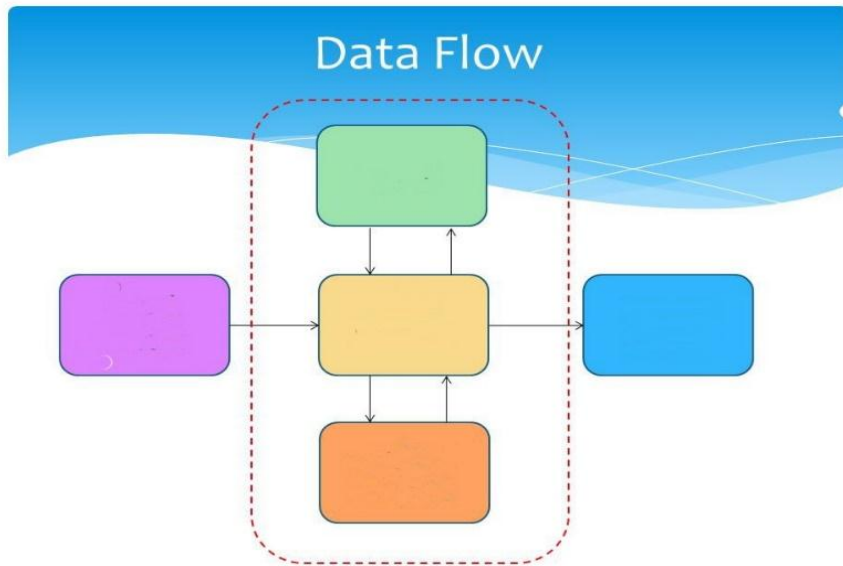
### II. Match each component in column A with its function in column B:

A	B
<ol style="list-style-type: none"> <li>1. Storage device</li> <li>2. Input device</li> <li>3. Output device</li> <li>4. Main memory</li> <li>5. Processor</li> </ol>	<ol style="list-style-type: none"> <li>a. It displays the processed data</li> <li>b. It holds the programs and data being used by the processor</li> <li>c. It does all the processing and controls the peripherals</li> <li>d. It allows data to be entered</li> <li>e. It provides permanent storage for programs and data</li> </ol>

### III. Complete the table:

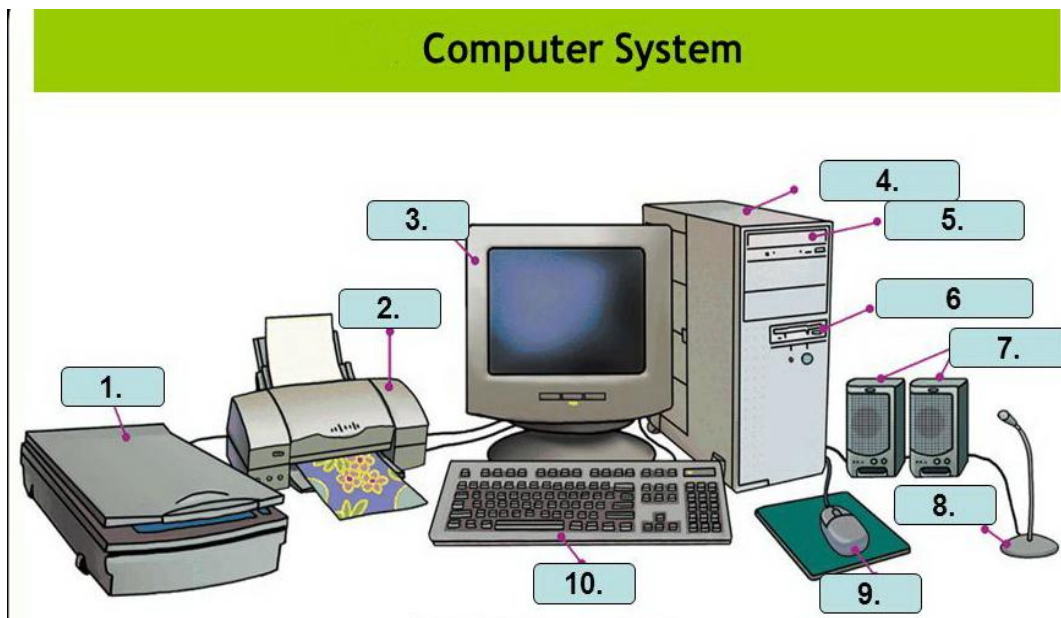
	Mainframe	Minicomputer	Microcomputer
Size			
Power			
Use			

### IV. Label the diagram of a computer system using these terms:



- a) Main memory
- b) Input device
- c) Output device
- d) Processor
- e) Storage device

**V. Name each component and write down its function**



1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____



1. **authenticate**, *v* O  
A: to fade. B: complicate. C: confirm. D: test.
2. **boot**, *v* O  
A: to fail gradually. B: enlarge. C: adjust. D: start up.
3. **browser**, *n* O software that allows you to  
A: explore the Internet. B: eavesdrop. C: send a fax. D: save a file.
4. **compress**, *v* O  
A: to shrink. B: understand. C: fix. D: soften.
5. **cracker**, *n* O  
A: fanatic. B: intruder. C: burglar. D: expert.
6. **cursor**, *n* O  
A: coarse speaker. B: indicator. C: moneychanger. D: technician.
7. **download**, *v* O  
A: to copy. B: scramble. C: erase. D: belittle.
8. **emoticon**, *n* O  
A: robot. B: radiation. C: trick. D: illustration.
9. **gigabyte**, *n* O  
A: sudden shutdown. B: unit of storage. C: wide gap. D: high pressure.
10. **glitch**, *n* O  
A: flash. B: excitement. C: error. D: stroke of luck.
11. **hit**, *n* O

A: accident. B: stumbling block. C: unit of measurement. D: visit.

12. **link**, *n* O

A: missing piece. B: space station. C: related site. D: warning signal.

13. **log on**, *v* O

A: to pile. B: gain access. C: waste time.

14. **modem**, *n* O

A: digital code. B: keyboard. C: visual display. D: connecting device.

15. **network**, *n* O

A: TV channel. B: digital design. C: system of computers. D: filter.

16. **pixel**, *n* O

A: picture element. B: programming oddity. C: brief blur. D: long delay.

17. **scanner**, *n* O machine that

A: reproduces images. B: translates files. C: searches a document. D: adds color.

18. **server**, *n* O

A: central computer. B: speed control. C: power supply. D: trouble-shooter.

19. **shareware**, *n* O

A: hand-me-down clothing. B: free hardware. C: relic. D: trial software.

20. **virus**, *n* O

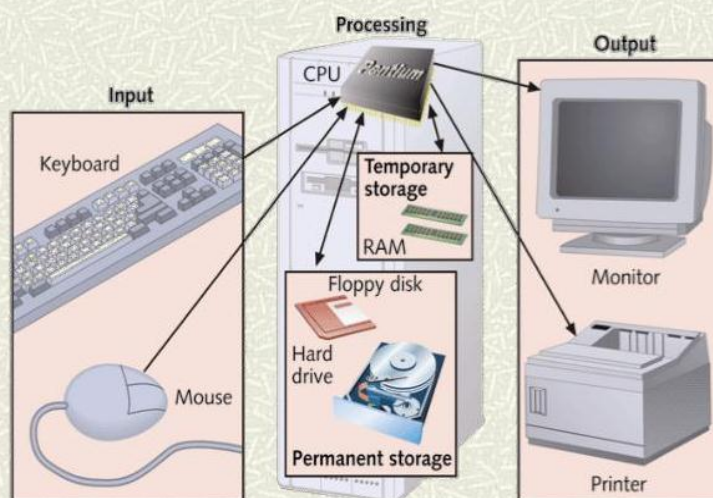
A: flaw. B: poison. C: fatigue. D: infection.



## 2. COMPUTER HARDWARE

# Computer System

It is a collection of related components that have all been designed to work together smoothly.



### Vocabulary:



*Study the vocabulary and learn the words*

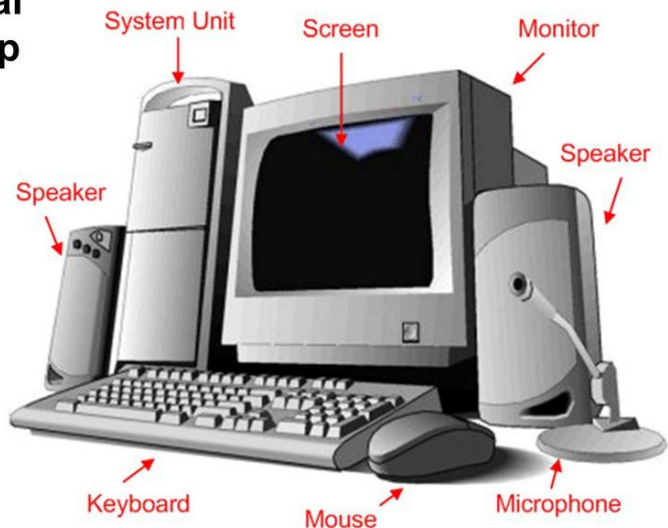
Keyboard	клавиатура
Mouse	мышь
to load	загружать
Instruction	команда
Error message	сообщение об ошибке
Input	ввод
Output	вывод информации
Button	кнопка

Memory	память
to create	создавать
Soft copy	мягкая копия, изображение на экране
Hard copy	твердая копия, машинная (печатная)
to attach	подсоединяться, подключать

*Read and translate the text 2*

## HARDWARE

- **Hardware** is the collection of physical devices that make up your computer system. These devices are also called components.



### What is the hardware?

The devices composing a computer system is called the hardware.

It can be divided into 4 categories:

- storage hardware.
- processing hardware.
- output hardware.
- input hardware.
- *Storage hardware*

- The purpose of storage hardware is to store computer instructions and data hardware.
- There are two types of output; soft copy and hard copy. Soft copy is information that is seen on a television-like screen, of monitor, attached to most computers. It is temporary; as soon as the monitor is turned off or new information is required, the old information vanishes. Hard copy is output printed in a tangible form such as on paper. It can be read without using the computer and can be conveniently carried around, written on, or passed to other readers.

### ***Processing hardware***

Processing hardware directs the execution of software instructions in the computer. The most common components of processing hardware are the central processing unit and main memory.

The central processing unit (CPU) is the brain of the computer. It reads and interprets software instructions and coordinates the processing.

Memory is the component of the computer in which information is stored. There are two types of computer memory: RAM and ROM.

RAM (random access memory) is the memory, used for creating, loading and running programs.

ROM (read only memory) is computer memory used to hold programmed instructions to the system.

The more memory you have in your computer, the more operations you can perform.

### ***Input hardware***

Input hardware collects data and converts them into a form suitable for computer processing. The most common input device is a keyboard. It looks very much like a typewriter. The mouse is hand-held device connected to the computer by a small cable. As the mouse is rolled across the desktop, the cursor moves across the screen. When the cursor reaches the desired location, the user

usually pushes a button on the mouse once or twice to give a command to the computer.

## Review of computer systems

### Hardware:

Computer Equipment

### Software:

Computer Programs



### Databases:

An organized collections of facts

#### I. Answer the following questions.



## Questions and Answers

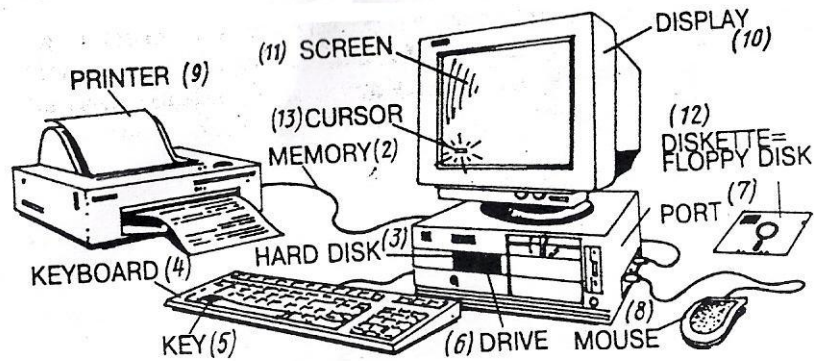
1. What is hardware?
2. What does input hardware do?
3. What is the most common input device?
4. What are the main components of processing hardware?
5. What is the purpose of storage hardware?
6. What do you think is a hard copy?

**II. Agree or disagree with the statements.**



1. Hard copy vanishes when we turn the computer off.
2. There are two types of input: soft copy and hard copy.
3. Processing occurs in the part of the computer called the mouse.
4. Information is stored in memory.
5. Hard copy can be read without using the computer.

**III. Fill in the table. Use the picture.**



№	English terms	
1		
2		Память
3	Hard disk	
4	Keyboard	
5		
6		Дисковод

7		Гнездо, порт
8	Mouse	
9	Print	
10	Display	
11		Экран
12		Дискета, гибкий диск
13	Cursor	

#### **IV. Translate the sentences from Russian into English.**

1. Одним из входных устройств является клавиатура.
2. К устройствам ввода относятся мышка, сканер, микрофон и многое другое.
3. Самая главная часть компьютера – центральный процессор.
4. Память помогает компьютеру хранить информацию.
5. Чем больше память в компьютере, тем больше операций можно выполнять.
6. Существуют 2 типа входных устройств: мягкая копия и твердая копия.

### 3.Passive Voice: grammar rules and exercises

<h1>Passive Voice</h1>			
Present Simple	Present Progressive	Present Perfect	Present Perfect Progressive
am/is/are V-3	is being V-3	have/has been V-3	<del>have been being V-3</del>
Past Simple	Past Progressive	Past Perfect	Past Perfect Progressive
was/were V-3	was/were being V-3	had been V-3	<del>V-3</del>
Future Simple	Future Progressive	Future Perfect	Future Perfect Progressive
will be V-3	<del>will be being V-3</del>	will have been V-3	<del>V-3</del>
Future in the Past Simple	Future in the Past Progressive	Future in the Past Perfect	Future in the Past Perfect Progressive
would be V-3	<del>would be being V-3</del>	would have been V-3	<del>V-3</del>

При спряжении глагола в страдательном залоге изменяется только глагол **to be** , смысловой глагол имеет во всех временах одну форму – Past Participle. Следовательно , время определяется формой , в котором стоит глагол в страдательном залоге , определяется формой , в которой стоит вспомогательный глагол **to be**.

Вспомогательный глагол ставится перед подлежащим при образовании вопросительной формы :

*Am I asked?*

*Меня спрашивают?*

*Shall I be asked? Меня спросят?*

*Have I been asked?*

*Меня спросили?*

*When was the book written?*

*Когда была написана книга?*

При образовании отрицательной формы Passive Voice частица *not* ставится после вспомогательного глагола:

*I am not asked.*

*I shall not be asked.*

С такими модальными глаголами как **have to, should, be to can (could), must, may (might) , ought to**, страдательный залог образуется с помощью **to be** и Past Participle основного глагола.

*This work must be finished today.*

*This report ought to be finished tonight.*

*That room cannot be used as a classroom.*

**1.) Rewrite these sentences in the Passive using Present Simple Tense:**

1. Students write tests every month.
2. They make beautiful toys at this factory.
3. They export millions of cars from Japan every year.
4. Watchmakers repair watches.
5. The bill includes service.
6. They close the shop. at 8.
7. He translates articles every day.
8. She doesn't send telegrams before every holiday.

**2.) Supply the Passive forms of the verbs in the box, using the Past Simple Tense: invent, plant, kill, write, discover, design, paint, build, name:**

1. When \_\_\_\_\_ America \_\_\_\_\_ ?
2. Five fruit-trees \_\_\_\_\_ in our garden last year.
3. The picture Mona Liza \_\_\_\_\_ by Leonardo da Vinci.
4. Marat \_\_\_\_\_ in his bath.



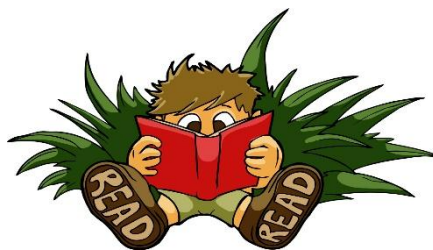
5. Radio \_\_\_\_\_ by A.Popov.
6. The first pyramid of Egypt \_\_\_\_\_ around 3000 BC.
7. The Winter Palace \_\_\_\_\_ by Rastrelli.
8. "War and Peace" \_\_\_\_\_ by L.Tolstoy.
9. Rossi street \_\_\_\_\_ after a famous Russian architect.

**3.) Make the following sentences active:**

1. Peripheral devices can be attached to the computer.
2. Computer instructions are also called programs.
3. This work is usually performed manually.
4. Computers are used to monitor environmental problems.
5. Today the lives of most of us are affected by a computer every day.
6. This program was damaged by a computer virus.
7. The 'crash behavior' of the airplane was determined by the scientists.
8. This monitor was designed by Dell Corp.

**4.) Make the following sentences passive:**

1. Hardware also includes peripheral devices.
2. Educators use computers in the classroom.
3. Scientists can build computer models of airplane crashes.
4. Today many businesses and organizations own computers.
5. These organizations use computers for different purposes.
6. Computers can process data in a fraction of time.
7. Engineers use computers to design replacement for the damaged bone.
8. Computers are changing our life.



## SUPPLEMENTARY READING

### Text 1. Global IoT Operating Systems Market: Snapshot

#### Exercise 1. *Learn the words.*

shell — оболочка

kernel — ядро

keep track — выслеживать

stagehand — работник сцены

props — реквизит

cue — театр. реплика

platter — большая плоская тарелка

single-tasking operating system — однозадачная операционная система

#### Exercise 2. *Read and translate*

The market for internet of things (IoT) has already taken off and is experiencing bold strides across various end-use industries. However, the market for IoT devices are characterized by several design and performance constraints, most notable of them being low memory, limited power, and low processing capacity. The need for a dedicated operating framework for IoT system stems from this need. This has generated vast industry interest in open source real-time operating system (RTOS) specifically designed for IoT framework. There are already a large number of open source operating systems (OSes) designed keeping in mind the various constraints in mind. Each commercially available operating system serves a set of needs in various IoT systems, with the existence of any one-size-fits-all OS not feasible.

In addition, the IoT operating systems also adapts to the changing requirement when application is transferred from one host to another. Some of the prominent IoT OS are Ubuntu Core (developed by Google LLC) and Fuchsia (developed by Canonical Ltd.)

The early adopters of these IoT operating systems mostly comprise industries such as aviation, healthcare, and industrial sectors, where the demands from IoT deployment are multifaceted and the needs are sophisticated. IoT operating systems broadly serves the following key purposes: help in multitasking, decides the scheduling and prioritizing tasks in the presence of limited resources, sets communication protocols, and notably avoids any overheads. The growing adoption of power-friendly compute resources in the IoT framework underpins the rapidly evolving demand for IoT operating systems. The proliferating deployment of smart embedded IoT devices in various application areas in developing and developed countries also augurs well for the demand for IoT operating system. With the dynamically changing requirements from the use of networked devices under IoT, the market may see the emergence of Linux operating system for IoT in the not-so-distant future. (1725 п.3н.)

***Exercise 3. Write down unknown words and word-combinations with transcription and translation***

***Exercise 4. Discuss with your group-mates the role of operating systems in computer system and its primary purpose.***

**Exercise 5 Put 10 special questions to the text**

## **GLOBAL IOT OPERATING SYSTEMS MARKET: OVERVIEW**

Internet of Things (IoT) operating framework is an operating framework intended for arranged and associated gadgets through Internet of Things. An operating framework oversees equipment and programming assets of the framework and gives normal administrations to them. The IoT Operating Systems is a propelled robotization and examination procedure which makes utilization of systems administration, detecting, huge information, and manmade brainpower innovation to convey end systems for a service. The IoT Operating Systems is the development of the implanted OS having different focal points, for example, little memory impression, bolster for heterogeneous equipment, service availability, continuous capacities, and security among others.

IoT operating systems gives memory and energy productivity to fit IoT gadgets. IoT operating systems intended for extensive variety of low-control gadgets with ongoing offices utilized as a part of sensor systems, brilliant structures, and individual zone organization and pervasive processing, and so on. IoT operating systems gives memory and vitality proficiency to fit IoT gadgets. Advantages of IoT operations systems are an insignificant memory, ongoing correspondence, adaptability, control administration, security and supporting diverse process models and availability conventions. (1195 печ.зн.)

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

## **Text 2. WHAT YOU SHOULD KNOW ABOUT OPERATING SYSTEMS**

### *Exercise 1. Learn the words*

pull-down menu — ниспадающее (раскрывающееся) меню

scroll bar — линейка прокрутки

volume — большое количество, регулятор громкости

power user — компетентный клиент, продвинутый пользователь

DLL (Dynamic-Link Library) — библиотека динамической  
компоновки (связи)

plague — надоедать, приносить вред

not to sit well with sb — не понравится, быть не по душе кому-нибудь

security vulnerabilities — уязвимости (слабые места) системы  
безопасности

default user interface — интерфейс пользователя по умолчанию

concern — вопрос, требующий разрешения

peer-to-peer technology — одноранговая технология

garner — собирать, копить

### *Exercise 2. Read and translate the text*

#### **What You Should Know About Operating Systems**

An operating system, or OS, is system software that manages computer hardware and software resources and provides common services for computer programs. Your computer applications, from document creation software and browser software to the most specialized applications, rely on your OS as a foundation for their storage and execution. Your desktop is like your mission control, in short. So investing in an interface you can trust and thrive on is as critical a choice as any in the software realm.

The majority of store-bought personal computers come with modern operating systems already installed. Mobile devices also have their own form of

OS (for example, an iPhone comes with Apple iOS). In many cases, you can install a different OS on top of the embedded systems that come with your computer. The operating system market has grown by leaps and bounds in the past two decades, and each offering has a unique user interface and set of features and specifications. If your job demands a certain level of performance or particular tools and strengths in your hardware, there is likely an OS that is perfect for you.

#### Key Benefits of Operating System Software

Help your computer or smartphone operate

Store your diverse set of applications and allow them to run as needed

Provide a smooth, customizable, graphical user interface (GUI) to manage your applications. (1183 печ.зн.)

***Exercise 3. Write down unknown words and word-combinations with transcription and translation***

***Exercise 4. Discuss with your group-mates the role of operating systems in computer system and its primary purpose.***

**Exercise 5 Put 10 special questions to the text**

### **WHY USE OPERATING SYSTEMS?**

***Learn the words.***

aware of sth — осведомлен о, знать;

fortunate — успешный, талантливый

program entry — вход программы

hexadecimal — шестнадцатиричная система исчисления

clumsy — неудобный, негибкий

source language — язык исходного текста

target language — выходной язык программирования

fail to do sth — оказаться неспособным сделать что-либо

trap — ловушка, аппаратное прерывание

blur — делать неясным, затуманивать

implication — причастность, скрытый смысл

glibly — правдоподобно

implementation language — язык реализации

from scratch — с нуля, с самого начала

outset — начальный этап

come to terms with sth — смириться с чем-либо

*bootstrapping* – загрузка, настройка

If you use computers in any capacity—including your work, school, or personal life—a reliable desktop interface is at the core of the equation. These tools are the software that manages your programs, and your hardware would not function the way it was intended without one. Additionally, mobile operating systems have helped handheld devices evolve from simply phones to the robust computers they are today.

Unless you live a computer-free life, you should understand the importance of operating systems and how they apply to you, your job, and your team. If you are not entirely satisfied as the user of your current device driver, you can consider the following factors and how a different system may be right for you.

**Programming Language** — The average user may never pay any mind to the programming languages underneath the hood of their operating system. But for certain people, such as developers themselves, this is an increasingly weighted part of their satisfaction with and potential for using an operating system. The code that makes up an OS—whether assembly language, C++, or one of the many niche languages to come out in recent years—affects the user’s ability to customize their device and use it for their specific needs. For many, there is a symbiotic relationship between their OS and the work they do. So while this may be irrelevant to some, it is a crucial aspect to others in choosing one platform over another.

**User Interface** — The user interface where you navigate between your program windows can define the overall OS experience. In the most well-known CPU platforms, the interface is an intuitive, attractive display with point-and-click desktop icons and menus. In the more niche platforms, this may be an entirely different experience, with a heavier emphasis on search queries and ergonomics than pleasing visualization software. This may be preferred for users who are running hundreds of windows a day and desire performance power over visual design. The question of interface may be a purely aesthetic one for some, but for others it is the deciding factor in choosing an OS.

**Specifications** — Not all operating systems are created equally. Just like certain powerful programs or games require a specific type of hardware, so do the different types of operating systems. These platforms can rely heavily on virtual memory, hard drive or disk drive power, and the quality of peripheral devices. Without the appropriate physical resources to match the specifications, not only will your applications not run properly, but the OS may fail to load in general. If you prefer out-of-the-box laptop computers with basic capabilities, this may rule out some of the more hearty operating systems. On the other hand, if your desktop devices are top-shelf machines customized for high performance, you may require a certain OS built for these scenarios. (2409 печ.3н.)

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*



## WHO USES OPERATING SYSTEMS?

As mentioned above, operating systems are perhaps the most commonly used type of software—because other software won't run without it! If you use modern computers for any reason, you use operating systems in the process. (This also includes smartphone operating systems.)

With that being said, there are certain departments or groups of people who may benefit from certain products over others in this category or put more thought into the decision based on the tasks they need to perform.

**Developers** — The choice between operating systems can be a point of contention in the development community, almost like rival gangs or schools. The number of coding languages increases every year, and with it, so does the number of careers built around development. Anyone who claims coding as a hobby or a part of their job will not only put extensive care into choosing a primary OS, they may switch between several interfaces in the course of their day. These programs are the foundation off which they might just develop the next million-dollar software solution or mobile app. So finding the system that caters to their coding specializations and gives them the tools they need is paramount.

**Designers** — Graphic designers and other design-minded individuals have a similar relationship to their OS as that of developers. These users run and work with the most modern applications available and require a platform that is not only reliable but can handle the immense amount of activity they will perform in an average day. It all begins with the right choice of hardware—with extensive speed, power, and memory—but this would mean nothing without the right operating system to tie it all together.

**Gamers** — At the intersection of development and design is the desktop gaming community, which has swelled into a worldwide phenomenon in tandem with the technology and the offerings. It has become a multi-billion dollar industry and a respected sport in its own right, with competitive gaming now being a big draw on streaming platforms and certain television stations around

the world. For serious gamers, investing in the right operating system can go hand-in-hand with their games of choice. Just like other large applications, games often demand the right specifications to run. Gamers may also run multiple games at once, stream their gaming activity, or leave games running while they do other things. Features like preemptive multitasking on certain systems can help balance this activity so the hardware does not get overworked and run the risk of crashing. (2167 печ.зн.)

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## **KINDS OF OPERATING SYSTEMS**

When searching for any type of operating system, there are a few things that are important to keep in mind. First, you should assess your needs as a user prior to making any decision. If you are primarily going to be using an operating system for business as opposed to personal use, it can narrow your selection options. Certain operating systems are more ideal for their gaming or development capabilities, which could impact your decision depending on these needs. Proprietary operating systems almost always come preinstalled on particular hardware devices, so if you have an affinity for a particular brand of hardware, it could dictate your choice. Open-source operating systems are often highly customizable, where proprietary platforms are more rigid and controlled, at the liberty of the vendors regarding changes and updates. Due to the customization options, open-source operating systems may require a higher level of technical knowledge.

No matter the operating system, stability should always be at the forefront of your judgment because of the immense repercussions that can come from a

crashed operating system. Keeping your data safe and accessible is invaluable. You should also take into account what system you are already running, if you are debating a change in operating systems, because files or software programs can be incompatible if you are attempting to transfer them from one to another. Therefore, it can be advantageous to maintain the same brand of operating system if you are deciding on an upgrade.

Oftentimes the decision-making process of selecting an operating system will boil down to personal preference. The selection can be intimidating and the volume of options grows each year, but below we'll explore some of the more popular operating systems and factors to consider with each.

**macOS** — macOS is proprietary, comes preinstalled on Apple computers, and is not highly customizable. You should be accustomed to, or prepared to learn, the general layout of Mac computers if you are interested in macOS. The operating system integrates with other Apple products, including the mobile operating system, iOS, and the **Apple iCloud** for storage purposes. It also provides access to Apple's App Store, which is proprietary to Apple products as well. macOS is very popular for personal users but can also be used for business purposes.

**Microsoft Windows** — Microsoft's Windows operating system is available for use on a variety of PC brands, tablets, and even video game consoles, but because of its proprietary nature, it is not very flexible. There have been a number of releases over the years in the Windows NT family of operating systems that have helped define the evolution of PC computers, including Windows XP, Windows Vista, and **Windows 10**. Windows is compatible with a number of programs but is convenient if you are used to using other Microsoft products, such as **Microsoft Office**. The integration with Microsoft Office also makes it a popular choice if you are searching for an operating system for your business. That being said, it is also a viable option if you are looking for an operating system for personal use.

**Linux** — Linux distributions, or distros, are open-source operating systems that run on the Linux kernel, meaning they are flexible operating systems and often free, which is beneficial if you are on a budget. However, Linux can be challenging if you are less tech-savvy, due to the focus on the command line to control all functions of the system. If you are an experienced user, the command line can become a very easy-to-use and resourceful tool. Because the Linux kernel is open source, it is highly customizable, and there are a variety of user interfaces available that you can choose from on any device. If you are a developer, Linux distros are worth looking into because of the flexibility, but for business purposes, or even just the common personal user, it can be complicated and oftentimes it does not allow access to proprietary software, which can be inefficient for businesses requiring that functionality. Linux is based on Unix, an operating system dating back to the 1970s.

**Mobile Operating Systems** — While there are some open-source mobile operating systems, oftentimes they are proprietary and offered on specific pieces of hardware. For example, Apple's iOS is preinstalled and unique to Apple's iPhones and iPad tablets. **Android** is an open-source option and runs on a range of mobile devices but also comes preinstalled on some hardware. If you are comfortable with specific devices, that will most likely dictate which operating system you choose. These operating systems are also attached to specific application stores. If you are interested in certain applications, they may not be available or contain the same level of functionality due to proprietary restrictions. You can use mobile OS interfaces for both business and personal adoption. (1158 печ.зн.)

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*Exercise 5. Make a summary of the text and be ready to tell it*

## **OPERATING SYSTEM FEATURES**

There are countless configurations of hardware, peripheral devices, and operating systems that will empower the user with the functionality that is best for them. As we previously discussed, the operating system market has options along the spectrum of features and user-friendliness, depending on your specialization and personal preferences. But there are some primary features you should keep in mind when researching your operating system decision that can greatly impact your experience.

**Software Updates** — Technology moves quickly. Not only are advancements made faster than we can keep up with, but developers work overtime on improvements based on trends, user feedback, emerging threats, and other factors. Once a new OS is released, it will typically see dozens if not hundreds of small tweaks before the next official release. You will see alerts or notifications about these software updates over the course of using your current version. System updates will be offered in the form of patches or automatic installations. Overall, these are a significant indicator of care and commitment from the developers. These robust, complicated platforms are released as fully formed as they can be, but it's important to understand that they are works in progress based on the speed at which technology grows and feedback is received. Updates can touch on everything from minor aesthetic improvements to critical security holes that are exposed in conjunction with new viruses.

**Vendor Support** — Similar to system updates, the ability to connect with your OS' developers with feedback or performance issues is a central feature of the overall experience. While this might still be doable with phone calls in certain cases, modern operating systems have streamlined the process with built-in vendor support through online communication channels. This is in addition to thorough tutorials and help articles that should come included on your hard drive or are accessible on the developer's website. When your OS suffers a crash or an application fails, this information will be sent to the support team. With certain platforms, the support team will be able to communicate with you directly, walk

you through a fix, or take control of your device entirely to investigate the situation. Depending on your line of work—and how much strain you put on your devices—this seamless support experience can be invaluable.

**Applications** — Operating systems are not just homes for your third-party apps and tools. In many cases, they offer proprietary programs that can be just as useful (if not more so) in your daily routine. Windows and Mac operating systems are famous for their built-in application programs, which range from **note-taking management software** to media players, in addition to games and tools like calculators. As you research operating systems for yourself or your business, take note of the included applications and if you prefer some over others. These various programs are a calling card of the biggest operating systems and can add up to a make-or-break feature for certain buyers.

**Permissions** — You may desire multiple accounts on the same computer or the ability to share devices across your business depending on the situation. The permissions feature allows you to manage this in great detail. You can delegate user access for however many people you need, which allows users to save and access their own files and programs and wall off their account with a unique password. This is especially handy if you have confidential information on your primary account but want others to be able to use the device at certain times.

**Security** — We unfortunately live in a time when cyberthreats run rampant, endangering personal information, finances, and the overall integrity and health of expensive computers. As the gatekeeper of your files, data, and critical applications, your operating system is also the most at-risk software you use, with the widest range of dangers presented against it. You can, and should, fortify your system with various kinds of **security software** to protect it at every level. With that said, your OS should come with its own security offerings that are designed to identify, block, and fight against threats, in addition to some form of recovery tool that helps save critical information and restore it in the event of hacks, viruses, or system failures. This is a feature that was once a

luxury but is now one of the most important considerations when it comes to operating systems, including network operating systems for network devices such as firewalls, switches, and routers. (3906 печ.зн.)

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

## **POTENTIAL ISSUES WITH OPERATING SYSTEMS**

**Complexity** — Outside of the most popular, consumer-minded operating systems, the other products in this category can involve a degree of difficulty in relation to their programming, installation, and general use. Even the most user-friendly platforms can present hurdles for the average user throughout the lifecycle of usage. If you are considering a new operating system, read some verified reviews to get a sense of the usability and what the expectations are for new users.

**Integrations and Application Support** — In a perfect world, every piece of software would play nice with the myriad hardware systems on the market. But due to the wide range of performance needs and specifications, your preferred OS may not integrate smoothly with your current hardware setup or applications. This can also pose an issue longer after setup, if you deal with new applications or files that conflict with your desktop's abilities. Fortunately, cloud computing allows you to manage certain files or applications without bothering your hard drive. But integrations or lack thereof are crucial to be aware of from the get-go.

**Performance** — Putting a strain on your car can cause the engine to overheat, no matter how flashy it may seem when you buy it. The same goes for your OS. As you stack programs onto your devices, juggle various tasks at once,

and your hardware ages in general, it can translate to performance issues such as lagging and overall diminishing speed. This can also lead to programs randomly being dropped or the operating system crashing entirely. Just like your car, the better you take care of your computer, the longer it will remain healthy. This should entail regular cleanings, such as deleting old files, and only running one or two programs at a time. Web activity can also be a drain on your operating system, so keep an eye on how many tabs you have open, downloads you perform, and how much content you stream at a given time. You should also be vigilant in your security efforts, block pop-ups, and not download files you don't trust to minimize the risk of performance problems.

OS performance overall has a lot to do with hardware quality. Some devices are more customizable than others, and this is important to keep in mind when planning a hardware upgrade for yourself or your organization. You should not try to install and run certain operating systems before looking into your hardware's specifications and capabilities in relation to what the OS requires. Even if your hardware has the right specifications, issues can still arise if your computer is struggling with memory or processing issues. So be sure to thoroughly vet your devices before upgrading to a new OS. (2284 печ.3н.)

***Exercise 1. Read and translate the text***

***Exercise 2. Write down unknown words and word-combinations with transcription and translation***

***Exercise 3 Put 10 special questions to the text***

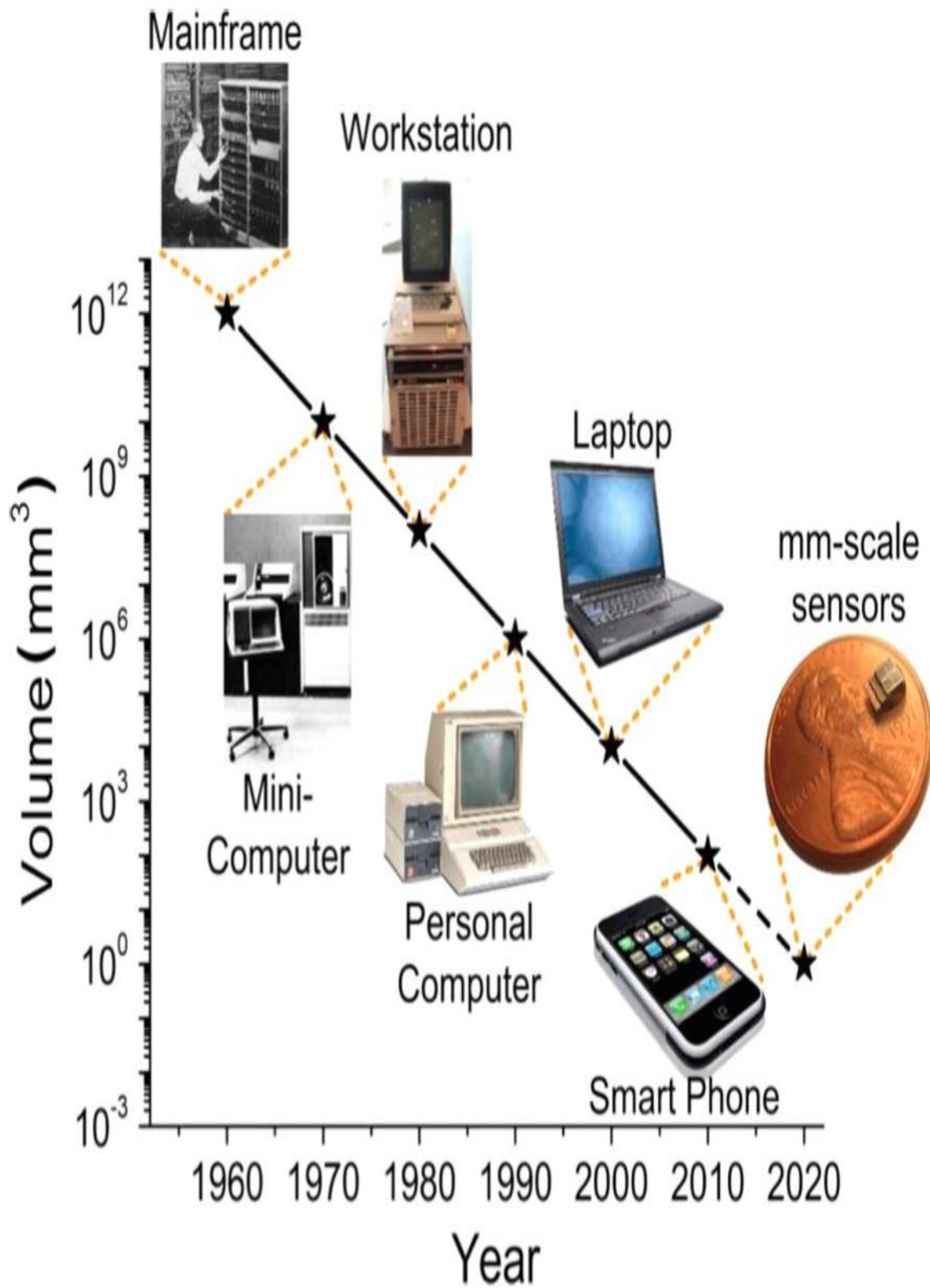
***Exercise 4. Discuss with your group-mates main problems of the text.***

***Exercise 5. Make a summary of the text and be ready to tell it***



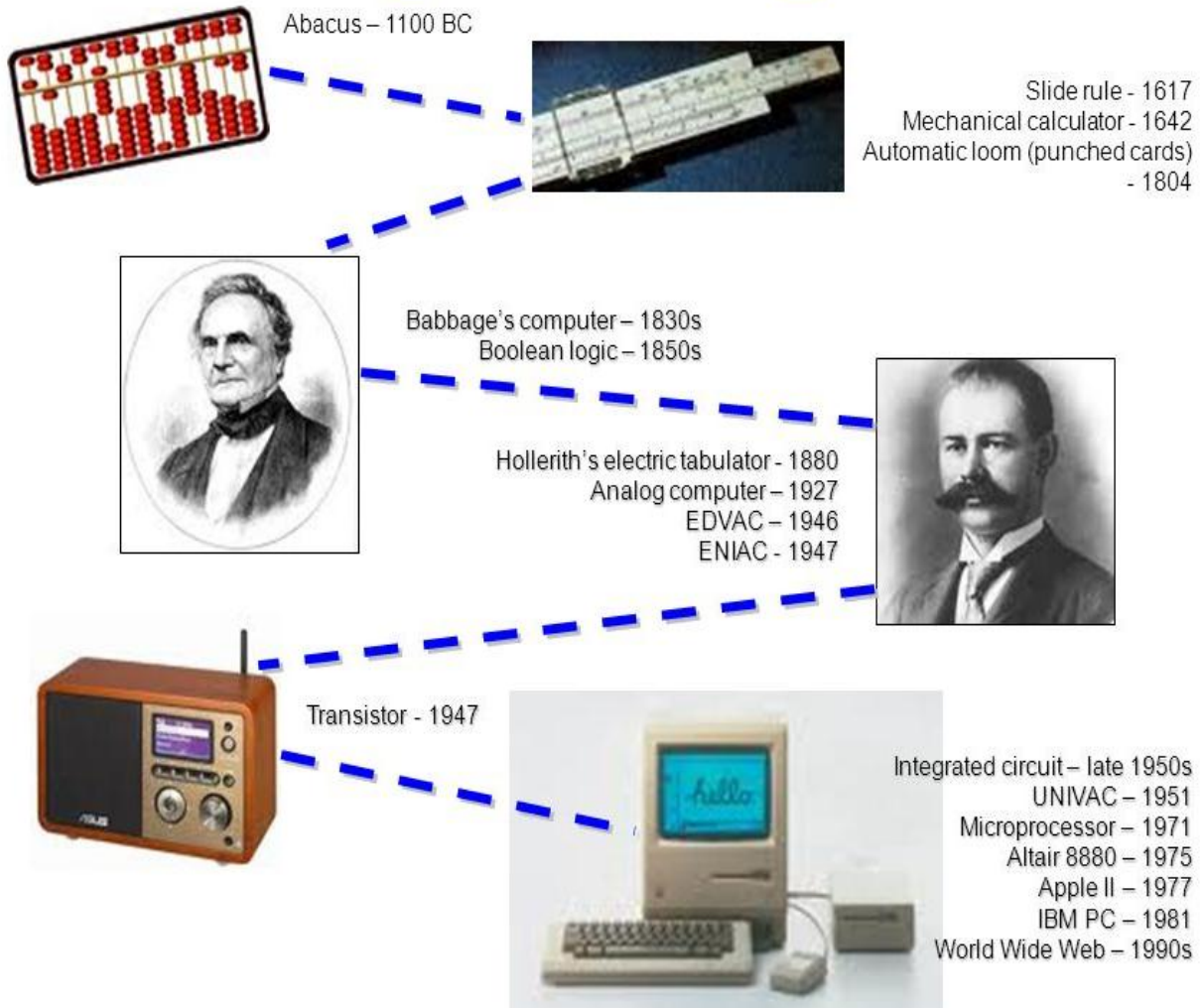
## UNIT II STAGES OF COMPUTER CREATING

### ЭТАПЫ СОЗДАНИЯ КОМПЬЮТЕРОВ



## TEXT 1 COMPUTERS ORIGINS

# History of Computers



The first suggestion that a machine for mathematical computation could be built was made more than a hundred years ago by the mathematician Charles Babbage. We now realize that he understood clearly all the fundamental principles of modern computers. Babbage was born in Devonshire, England, 1792. He did not receive a good education, but he taught himself mathematics so well that when he went in Cambridge, he found that he knew more algebra than his tutor.

At that time mathematics in Cambridge was still under the influence of Newton and was quite unaffected by the contemporary developments on the continent.

Charles Babbage was outstanding among his contemporaries because he insisted on practical application of science and mathematics. For example, he wrote widely on the economic advantages of mass productions and on the development of machine tools.

In 1812 he was sitting in his room looking at a table of logarithms which he knew to be full of mistakes, when an idea occurred to him of computing all tabular functions by machinery. Babbage constructed a small working model which he demonstrated in 1822.

The Royal Society supported the project and Babbage was promised a subsidy.

In 1833 he began to think of building a machine which was in fact the first universal digital computer, as the expression is understood today.

Babbage devoted the rest of his life to an attempt to develop it. He had to finance all of the work himself and he was only able to finish part of the machine though he prepared thousands of detailed drawings from which it could be made.

Babbage wrote more than 80 books and papers, but he was misunderstood by his contemporaries and died a disappointed man in 1871.

He tried to solve by himself and with his own resources a series of problems which in the end required the united efforts of two generations of engineers.

After his death his son continued his work and built part of an arithmetic's unit, which printed out its results directly on paper.

## I. Translate the words from Russian into English

- 1) Математические вычисления \_\_\_\_\_
- 2) Основные принципы \_\_\_\_\_
- 3) Хорошее образование \_\_\_\_\_
- 4) Практическое применение науки и математики \_\_\_\_\_
- 5) Экономические преимущества производства \_\_\_\_\_
- 6) Логарифм \_\_\_\_\_
- 7) Подсчет функций при помощи машины \_\_\_\_\_
- 8) Конструировать \_\_\_\_\_
- 9) Рабочая модель \_\_\_\_\_
- 10) Цифровой компьютер \_\_\_\_\_
- 11) Арифметический центр \_\_\_\_\_
- 12) Распечатать результаты \_\_\_\_\_
- 13) Основные принципы современных компьютеров \_\_\_\_\_
- 14) Математик \_\_\_\_\_
- 15) Финансировать \_\_\_\_\_

## II. Complete the sentences.

- 1) Babbage was born ... \_\_\_\_\_ .
- 2) Charles Babbage was outstanding because ... \_\_\_\_\_ .
- 3) Babbage constructed ... \_\_\_\_\_ .
- 4) In 1833 he began ... \_\_\_\_\_ .
- 5) When he went to Cambridge \_\_\_\_\_ .
- 6) Babbage devoted ... \_\_\_\_\_ .
- 7) Babbage wrote ... \_\_\_\_\_ .
- 8) He was misunderstood ... \_\_\_\_\_ .
- 9) Babbage was promised ... \_\_\_\_\_ .
- 10) His son built ... \_\_\_\_\_ .
- 11) Babbage did not receive ... \_\_\_\_\_ .
- 12) He understood clearly ... \_\_\_\_\_ .

**III. Agree or disagree.**



1) Babbage knew more algebra than his tutor in Cambridge.

---

2) He received a good education.

---

3) Babbage was born in Cambridge.

---

4) Babbage depend on the practical mathematics and application of science. \_\_\_\_\_ - \_\_\_\_\_

5) Babbage constructed a small working model and demonstrated it in 1833. \_\_\_\_\_

6) The Royal Society financed all of the work. \_\_\_\_\_

7) Babbage finished his machine in 1871.

---

8) He was misunderstood by contemporaries. \_\_\_\_\_

9) Babbage taught himself mathematics very well.

---

10) Mathematics in Cambridge was under the influence of Babbage.

---

11) Babbage wrote on the economic advantages of mass productions.

---

12) Babbage died a disappointed man in 1833.

---

**IV. Answer the questions to the text.**



# Questions and Answers

1) When was the first suggestion about computers made?

---

2) When did Babbage demonstrate a small working model?

---

3) Did anybody finance all of the work?

---

4) When did Babbage die?

---

5) Who continued his work?

---

6) He did not receive good education, did he?

---

7) Why was Babbage outstanding among his contemporaries?

---

8) Who wrote on the economic advantages of mass productions?

---

9) Who built a part of an arithmetic unit after his death?

---

10) When did he begin to think of building a machine?

---

11) At that time mathematics in Cambridge was under the influence of Newton, wasn't it?

---

12) Did Babbage finish his work?

---

**V. Translate the sentences.**

1) Первый компьютер был разработан Чарльзом Беббиджем более 100 лет назад. \_\_\_\_\_

2) В 1822 г. Беббидж сконструировал небольшую рабочую модель.

---

3) Ч.Беббидж написал более 80-и книг.

---

4) В 1833 г. он начал разрабатывать первый универсальный цифровой компьютер.

---

5) После его смерти сын продолжил его работу.

---

## TEXT 2 COMPUTERS TODAY

### Vocabulary



*Study the vocabulary and learn the words*

tool	инструмент;
Peripheral devices (peripherals)	периферийные устройства;
instruction	команда, инструкция, указание;
enable	разрешать, позволять, делать возможным,
fraction of the time	за короткое время;
to lurk	скрываться, оставаться незамеченным;
transaction	сделка, группа операций;
to monitor	наблюдать, контролировать, следить;
to process	обрабатывать;
solution	решение
application	применение, использование
to interact	взаимодействовать;
to control	управлять, регулировать;
to reduce costs	сокращать затраты;
otherwise	иначе, иным образом;
to affect	влиять, воздействовать.



## **COMPUTERS TODAY**

Yesterday's computers were tools for scientists, mathematicians, and engineers. Today many businesses and organizations own computers although they have different types of computers and use them for different purposes. Hardly a day goes by when do not make a controlled business transaction. Each time we visit the bank, use a credit card, pay a bill or a ticket a computer lurks behind the scene, recording each transaction. Computers can process data in a fraction of the time it would take to perform the same jobs manually. They reduce the paperwork involved in these transactions and also reduce costs. No area of enterprise seems without computers nowadays. Scientists build computer models of airplane crashes in order to determine the 'crash behavior' of airplanes, which in turn helps aircraft designers plan safer seats, windows, and fabrics to decrease fire hazards during a crash. Ecologists use computers to monitor environmental problems like acid rain and suggest solutions. Engineers use computers to design replacement for the damaged bones. Educators use computers in the classroom to perform chemistry experiments that might otherwise be dangerous. There seems to be no limit to computer applications. Hard copy, modem, database, peripherals: all these words refer to a relatively new and rapidly changing technology – that of the computer. Computers are changing our language, and they are also changing us. No longer are computer expert the only people who interact with computers. Today the lives of most of us are affected by computers every day.

### **I. Answer the following questions:**



## Questions and Answers

1. Who interacted with yesterday's computers?
2. What service do computers in business provide?
3. How do ecologists use computers?
4. How do engineers use them?
5. How do educators use them?
6. Where can we find computers in our life?
7. What computer manufacturers do you know?

### **II. Agree or disagree with the statements.**



**Agree**



**Disagree**

1. Today computers are operated only by scientists, mathematicians and engineers.
2. Businesses and organizations own and use only personal computers.
3. All computers are produced of the same size and power.
4. In offices computers are used only as typewriters.
5. Any kind of job can be performed with the help of the computer.
6. Our lives are affected by computers every day.
7. All country schools have computer classes.

---

### **III. Translate from Russian into English.**

1. В настоящее время нельзя обойтись без компьютера.
2. Каждый день мы ходим в банк, пользуемся кредитной картой, оплачиваем счёт, а компьютер остается незамеченным.
3. Компьютеры могут за короткое время обработать информацию.
4. Нет предела применению компьютера.
5. Экологи используют компьютеры, чтобы наблюдать за проблемами окружающей среды.
6. Учёные строят компьютерные модели самолётов.
7. Компьютеры используются в разных целях.

#### **IV. Read the text**

Without my computer I would not have the pleasure of the getting to my favourite sites, I would have difficulty in communication with my friends, and I would not be able to do my work for college. I often wonder how we all managed before computers were a common place in the home. I just don't have the time to be always running to the post box to send letters. E – mail is very important when you have a tough schedule. Most of my relaxed time is spent at the computer as by the time I finish doing homework. I am too tired and it is often too late to go out. It is reference aid and educational tool. If all else fails, you can play cards on it, although I am for action games!

#### **V. Write an essay giving your opinion on the following topic:**

„Imagine that you could only use one of the following: a computer, a mobile phone or a car. Which one would you use and why?“

---

---

#### **VI. Speak on the following:**

**„Computers change our life“**

Use questions:

1. Do you have your own computer?
2. What purposes do you use it for?
3. How long have you had PC?
4. What devices is it supplied with?

## GRAMMAR: Perfect Tenses

### 3. The Present Perfect Tense (Настоящее совершенное время):

#### grammar rules and exercises

to ask в the Present Perfect Tense

Утвердительная	Вопросительная	Отрицательная
I have asked	Have I asked?	I have not asked
He } She } has asked It }	he } she } has asked It }	He } She } has not asked It }
We } You } have asked They }	we } Will } you asked? They }	We } You } have not asked They }

#### GRAMMAR: Present Perfect употребляется:

1) Для выражения действия, законченного к моменту речи, но связанного с настоящим. Эта связь с настоящим может быть выражена:

а) имеющимся налицо результатом ранее совершившегося действия:

I have received a letter, Look! Here it is! - Я получил письмо. Посмотрите! Вот оно.

б) временем совершения действия, выраженным следующими обстоятельственными словами:

today, this week, this month, this year и т. п., которые обозначают не истекший период времени:

I have seen this film today. - Я видела этот фильм сегодня.

2) С наречиями неопределенного времени, такими как ever когда-либо, never никогда, just только что, yet всё еще, often часто, already уже:

Have you ever been to Leningrad? - Были ли вы когда-нибудь в Ленинграде?

No, I have never been there. I have just seen him. - Нет, я никогда там не был. Я только что его видела.

3) Иногда Present Perfect употребляется для выражения действия, которое началось в ПРОШЛОМ и не закончено к настоящему моменту (со словами since с тех пор, с, и for в течение):

I have not seen you since spring. - Я не видела вас с весны.

He fell ill and left Moscow and I have not seen him since. - Он заболел и уехал из Москвы, и с тех пор я его не видела.

We have known him for 7 years. - Мы знаем его 7 лет.

Present Perfect обычно переводится на русский язык глаголом в прошедшем времени совершенного или несовершенного вида. Если же действие, выраженное Present Perfect, не закончено к данному моменту, то Present Perfect переводится глаголом настоящего времени:

I have known him for many years. - Я знаю его много лет.

### 1. Make questions from the words in brackets.

1. (always/ live/ in that city) \_\_\_\_\_
2. (ever/ be/ Taxes) \_\_\_\_\_
3. (ever/ ride/ bike) Have you ever ridden a bike?
4. (ever/ run/ marathon) \_\_\_\_\_
5. (ever/ read/ famous writer) \_\_\_\_\_
6. (most beautiful city/ ever/ visit) What \_\_\_\_\_

### 2. Complete these sentences using *today/ this year/ this term etc.*

1. I saw Mary last week but I haven't seen him today.
2. I read a newspaper yesterday but I \_\_\_\_\_
3. Last month the company made a profit but this month \_\_\_\_\_
4. Tracy worked hard at college last term but \_\_\_\_\_
5. It rained a lot last autumn but \_\_\_\_\_
6. Our handball team won a lot of games last year but we \_\_\_\_\_

**3. Supply either the Present Simple or the Present Perfect in the following sentences.**

1. I can't speak about the book. I (not read)\_\_\_\_\_ it yet.
2. Every Monday I (wind up)\_\_\_\_\_ my clock at 8 a.m in the morning.
3. It is Friday. ... you (see)\_\_\_\_\_ him this week?
4. Students usually (buy)\_\_\_\_\_ books at the House of Books.
5. It's a pity, but I (not buy)\_\_\_\_\_ this dictionary yet.
6. As a rule we (do)\_\_\_\_\_ many exercises in class.
7. Re (tell)\_\_\_\_\_ this joke many times.
8. Something (go)\_\_\_\_\_ wrong with my watch.
9. I already (translate)\_\_\_\_\_ these sentences into French.
10. They (have)\_\_\_\_\_ their English many hours a week.
11. She (work)\_\_\_\_\_ much and usually (get) many' good marks.
- 1 2. We (buy)\_\_\_\_\_ a new TV set this year.

**4. Rewrite the sentences using the Present Perfect or the Past Simple:**

**Examples:** I am writing a letter to my cousin (already. yesterday).

I have already written a letter to my cousin.

I wrote a letter to my cousin yesterday.

1. The waitress is bringing our tea. (a few minutes ago. not yet)

---

2. The bell is ringing, (just; some minutes ago)

---

3. He is going to London in a few days. (already; last week)

---

4. The girls are playing violins in the concert hall now. (yesterday; many times)\_\_\_\_\_

5. My mother is reading a new novel. (this month; last year)

---

6. Students are cleaning their classrooms. (already, last Saturday)

---

7. The teacher is explaining a new rule. (Just; at the previous lesson)

---

8. Ann is doing her homework now. (just; on Friday)

---

9. They are discussing this problem again. (many times; a few days ago)

---

10. Granny is making a birthday cake. (just, yesterday)

---

11. The birds are flying to the South, (already; at the end of August)

---

1 2. The train is coming. (just; an hour ago)

---

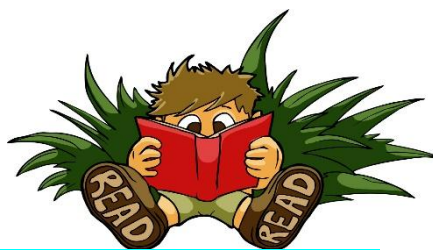
13. Who is your friend speaking to? (yesterday, just)

---

14. We are writing the words of Lesson 7. (Already, at the last lesson)

---





## Supplementary Reading

### COGS AND CALCULATORS

#### *. Learn the words.*

abacus — счеты

difference engine — разностная машина

punch card — перфокарта

predecessor — предшественник

gradually — постепенно; пошагово

release — выпускать

frustrating — разочаровывающий

solely — один лишь; исключительный

decryption — расшифровка

traffic — поток информации

contribution — вклад

contribute — делать вклад; способствовать

distributed computing — распределенное вычисление

algorithmic trading — алгоритмическая торговля

liquidity — ликвидность

underlie — делать акцент на

It is a measure of the brilliance of the abacus, invented in the Middle East circa 500 BC, that it remained the fastest form of calculator until the middle of the 17th century. Then, in 1642, aged only 18, French scientist and philosopher **Blaise Pascal** (1623–1666) invented the first practical mechanical calculator, the Pascaline, to help his tax-collector father do his sums. The

machine had a series of interlocking cogs (gear wheels with teeth around their outer edges) that could add and subtract decimal numbers. Several decades later, in 1671, German mathematician and philosopher **Gottfried Wilhelm Leibniz** (1646–1716) came up with a similar but more advanced machine. Instead of using cogs, it had a "stepped drum" (a cylinder with teeth of increasing length around its edge), an innovation that survived in mechanical calculators for 300 hundred years. The Leibniz machine could do much more than Pascal's: as well as adding and subtracting, it could multiply, divide, and work out square roots. Another pioneering feature was the first memory store or "register."

Apart from developing one of the world's earliest mechanical calculators, Leibniz is remembered for another important contribution to computing: he was the man who invented binary code, a way of representing any decimal number using only the two digits zero and one. Although Leibniz made no use of binary in his own calculator, it set others thinking. In 1854, a little over a century after Leibniz had died, Englishman **George Boole** (1815–1864) used the idea to invent a new branch of mathematics called Boolean algebra. In modern computers, binary code and Boolean algebra allow computers to make simple decisions by comparing long strings of zeros and ones. But, in the 19th century, these ideas were still far ahead of their time. It would take another 50–100 years for mathematicians and computer scientists to figure out how to use them. (1608 печ.зн.)

*Exercise 1. Read and translate the text*

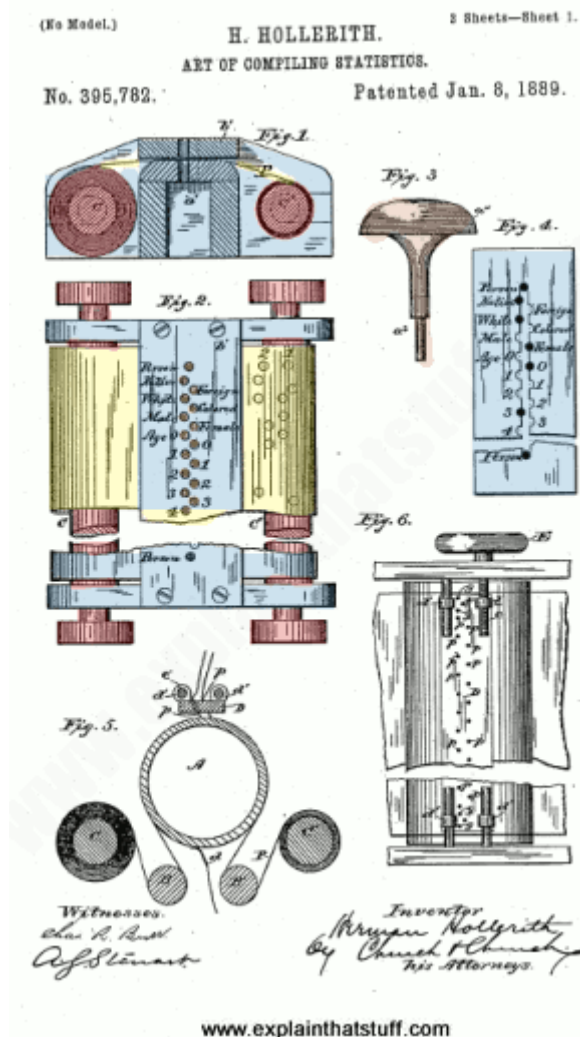
*Exercise 2. Write down unknown words and word-combinations with transcription and translation*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

## ENGINES OF CALCULATION



Neither the abacus, nor the mechanical calculators constructed by Pascal and Leibniz really qualified as computers. A calculator is a device that makes it quicker and easier for people to do sums—but it needs a human operator. A computer, on the other hand, is a machine that can operate automatically, without any human help, by following a series of stored instructions called a program (a kind of mathematical recipe). Calculators evolved into computers when people devised ways of making entirely automatic, programmable calculators.

Photo: Punched cards: Herman Hollerith perfected the way of using punched cards and paper tape to store information and feed it into a machine. Here's a drawing from his 1889 patent [Art of Compiling Statistics](#) (US Patent#395,782), showing how a strip of paper (yellow) is punched with different patterns of holes (orange) that correspond to statistics

gathered about people in the US census. Picture courtesy of US Patent and Trademark Office.

The first person to attempt this was a rather obsessive, notoriously grumpy English mathematician named **Charles Babbage** (1791–1871). Many regard Babbage as the "father of the computer" because his machines had an input (a way of feeding in numbers), a memory (something to store these numbers while complex calculations were taking place), a processor (the number-cruncher that carried out the calculations), and an output (a printing mechanism)—the same basic components shared by all modern computers. During his lifetime, Babbage never completed a single one of the hugely ambitious machines that he tried to build. That was no surprise. Each of his programmable "engines" was designed to use tens of thousands of precision-made gears. It was like a pocket watch scaled up to the size of a [steam engine](#), a

Pascal or Leibniz machine magnified a thousand-fold in dimensions, ambition, and complexity. For a time, the British government financed Babbage—to the tune of £17,000, then an enormous sum. But when Babbage pressed the government for more money to build an even more advanced machine, they lost patience and pulled out. Babbage was more fortunate in receiving help from **Augusta Ada Byron** (1815–1852), Countess of Lovelace, daughter of the poet Lord Byron. An enthusiastic mathematician, she helped to refine Babbage's ideas for making his machine programmable—and this is why she is still, sometimes, referred to as the world's first computer programmer. [2] Little of Babbage's work survived after his death. But when, by chance, his notebooks were rediscovered in the 1930s, computer scientists finally appreciated the brilliance of his ideas. Unfortunately, by then, most of these ideas had already been reinvented by others.

Babbage had intended that his machine would take the drudgery out of repetitive calculations. Originally, he imagined it would be used by the army to compile the tables that helped their gunners to fire cannons more accurately. Toward the end of the 19th century, other inventors were more successful in their effort to construct "engines" of calculation. American statistician **Herman Hollerith** (1860–1929) built one of the world's first practical calculating machines, which he called a tabulator, to help compile census data. Then, as now, a census was taken each decade but, by the 1880s, the population of the United States had grown so much through immigration that a full-scale analysis of the data by hand was taking seven and a half years. The statisticians soon figured out that, if trends continued, they would run out of time to compile one census before the next one fell due. Fortunately, Hollerith's tabulator was an amazing success: it tallied the entire census in only six weeks and completed the full analysis in just two and a half years. Soon afterward, Hollerith realized his machine had other applications, so he set up the Tabulating Machine Company in 1896 to manufacture it commercially. A few years later, it changed its name to the Computing-Tabulating-Recording (C-T-R) company and then, in 1924,

acquired its present name: International Business Machines (IBM). (3483 печ.зн.)

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation*

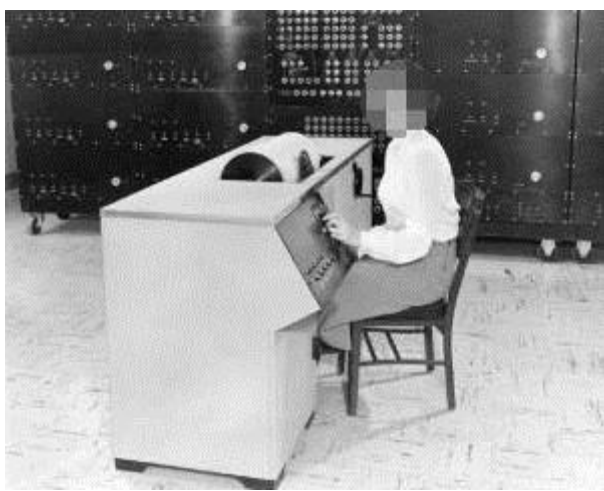
*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

### **BUSH AND THE BOMB**

The history of computing remembers colorful characters like Babbage, but others who played important—if supporting—roles are less well known. At the time when C-T-R was becoming IBM, the world's most powerful calculators were being developed by US government scientist **Vannevar Bush** (1890–1974). In 1925, Bush made the first of a series of unwieldy contraptions with equally cumbersome names: the New Recording Product Integraph Multiplier. Later, he built a machine called the Differential Analyzer, which used gears, belts, levers, and shafts to represent numbers and carry out calculations in a very physical way, like a gigantic mechanical slide rule. Bush's ultimate calculator was an improved machine named the Rockefeller Differential Analyzer, assembled in 1935 from 320 km (200 miles) of wire and 150 [electric motors](#). Machines like these were known as [analog](#) calculators—[analog](#) because they stored numbers in a physical form (as so many turns on a wheel or twists of a belt) rather than as digits. Although they could carry out incredibly complex



calculations, it took several days of wheel cranking and belt turning before the results finally emerged.

*Photo: A Differential Analyzer. The black part in the background is the*

*main part of the machine. The operator sits at a smaller console in the foreground. Picture courtesy of [NASA on the Commons](#) (where you can download a larger version of this photo).*

Impressive machines like the Differential Analyzer were only one of several outstanding contributions Bush made to 20th-century technology. Another came as the teacher of **Claude Shannon** (1916–2001), a brilliant mathematician who figured out how electrical circuits could be linked together to process binary code with Boolean algebra (a way of comparing binary numbers using logic) and thus make simple decisions. During World War II, President Franklin D. Roosevelt appointed Bush chairman first of the US National Defense Research Committee and then director of the Office of Scientific Research and Development (OSRD). In this capacity, he was in charge of the Manhattan Project, the secret \$2-billion initiative that led to the creation of the atomic bomb. One of Bush's final wartime contributions was to sketch out, in 1945, an idea for a memory-storing and sharing device called Memex that would later inspire Tim Berners-Lee to invent the WWW. Few outside the world of computing remember Vannevar Bush today—but what a legacy! As a father of the digital computer, an overseer of the atom bomb, and an inspiration for the Web, Bush played a pivotal role in three of the 20th-century's most far-reaching technologies. (2238 печ.зн.)

***Exercise 1. Read and translate the text***

***Exercise 2. Write down unknown words and word-combinations with transcription and translation***

***Exercise 3 Put 10 special questions to the text***

***Exercise 4. Discuss with your group-mates main problems of the text.***

***Exercise 5. Make a summary of the text and be ready to tell it***

### **TURING—TESTED**

Many of the pioneers of computing were hands-on experimenters—but by no means all of them. One of the key figures in the history of 20th-century computing, **Alan Turing** (1912–1954) was a brilliant Cambridge mathematician

whose major contributions were to the *theory* of how computers processed information. In 1936, at the age of just 23, Turing wrote a groundbreaking mathematical paper called "On computable numbers, with an application to the Entscheidungsproblem," in which he described a theoretical computer now known as a Turing machine (a simple information processor that works through a series of instructions, reading data, writing results, and then moving on to the next instruction). Turing's ideas were hugely influential in the years that followed and many people regard him as the father of modern computing—the 20th-century's equivalent of Babbage.

Although essentially a theoretician, Turing did get involved with real, practical machinery, unlike many mathematicians of his time. During World War II, he played a pivotal role in the development of code-breaking machinery that, itself, played a key part in Britain's wartime victory; later, he played a lesser role in the creation of several large-scale experimental computers including ACE (Automatic Computing Engine), Colossus, and the Manchester/Ferranti Mark I (described below). Today, Alan Turing is best known for conceiving what's become known as the Turing test, a simple way to find out whether a computer can be considered intelligent by seeing whether it can sustain a plausible conversation with a real human being. (1367 печ.зн.)

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

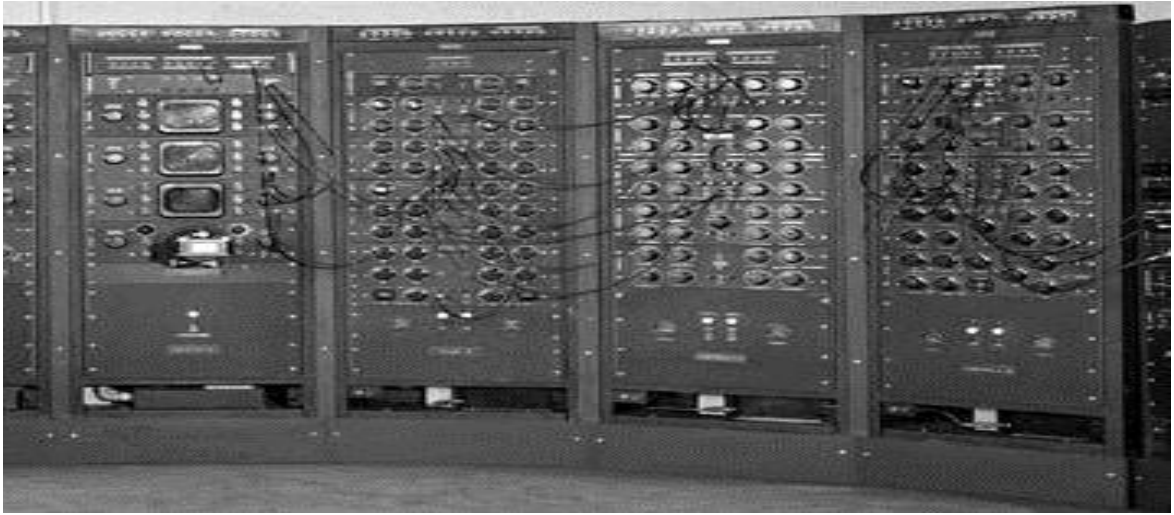
### **THE FIRST MODERN COMPUTERS**

The World War II years were a crucial period in the history of computing, when powerful gargantuan computers began to appear. Just before the outbreak of the war, in 1938, German engineer **Konrad Zuse** (1910–1995) constructed

his Z1, the world's first programmable binary computer, in his parents' living room. The following year, American physicist **John Atanasoff** (1903–1995) and his assistant, electrical engineer **Clifford Berry** (1918–1963), built a more elaborate binary machine that they named the Atanasoff Berry Computer (ABC). It was a great advance—1000 times more accurate than Bush's Differential Analyzer. These were the first machines that used electrical switches to store numbers: when a switch was "off", it stored the number zero; flipped over to its other, "on", position, it stored the number one. Hundreds or thousands of switches could thus store a great many binary digits (although binary is much less efficient in this respect than decimal, since it takes up to eight binary digits to store a three-digit decimal number). These machines were digital computers: unlike analog machines, which stored numbers using the positions of wheels and rods, they stored numbers as digits.

The first large-scale digital computer of this kind appeared in 1944 at Harvard University, built by mathematician **Howard Aiken** (1900–1973). Sponsored by IBM, it was variously known as the Harvard Mark I or the IBM Automatic Sequence Controlled Calculator (ASCC). A giant of a machine, stretching 15m (50ft) in length, it was like a huge mechanical calculator built into a wall. It must have *sounded* impressive, because it stored and processed numbers using "clickety-clack" electromagnetic [relays](#) no fewer than 3304 of them. Impressive they may have been, but relays suffered from several problems: they were large (that's why the Harvard Mark I had to be so big); they needed quite hefty pulses of power to make them switch; and they were slow (it took time for a relay to flip from "off" to "on" or from 0 to 1).





*Photo: An analog computer being used in military research in 1949. Picture courtesy of [NASA on the Commons](#) (where you can download a larger version).*

Most of the machines developed around this time were intended for military purposes. Like Babbage's never-built mechanical engines, they were designed to calculate artillery firing tables and chew through the other complex chores that were then the lot of military mathematicians. During World War II, the military co-opted thousands of the best scientific minds: recognizing that science would win the war, Vannevar Bush's Office of Scientific Research and Development employed 10,000 scientists from the United States alone. Things were very different in Germany. When Konrad Zuse offered to build his Z2 computer to help the army, they couldn't see the need—and turned him down.

On the Allied side, great minds began to make great breakthroughs. In 1943, a team of mathematicians based at Bletchley Park near London, England (including Alan Turing) built a computer called Colossus to help them crack secret German codes. Colossus was the first fully [electronic](#) computer. Instead of relays, it used a better form of switch known as a vacuum tube (also known, especially in Britain, as a valve). The vacuum tube, each one about as big as a person's thumb and glowing red hot like a tiny electric light bulb, had been invented in 1906 by **Lee de Forest** (1873–1961), who named it the Audion. This breakthrough earned de Forest his nickname as "the father of radio" because

their first major use was in [radio receivers](#), where they [amplified](#) weak incoming signals so people could hear them more clearly. In computers such as the ABC and Colossus, vacuum tubes found an alternative use as faster and more compact switches.

Just like the codes it was trying to crack, Colossus was top-secret and its existence wasn't confirmed until after the war ended. As far as most people were concerned, vacuum tubes were pioneered by a more visible computer that appeared in 1946: the Electronic Numerical Integrator And Calculator (ENIAC). The ENIAC's inventors, two scientists from the University of Pennsylvania, **John Mauchly** (1907–1980) and **J. Presper Eckert** (1919–1995), were originally inspired by Bush's Differential Analyzer; years later Eckert recalled that ENIAC was the "descendant of Dr Bush's machine." But the machine they constructed was far more ambitious. It contained nearly 18,000 vacuum tubes (nine times more than Colossus), was around 24 m (80 ft) long, and weighed almost 30 tons. ENIAC is generally recognized as the world's first fully electronic, general-purpose, digital computer. Colossus might have qualified for this title too, but it was designed purely for one job (code-breaking); since it couldn't store a program, it couldn't easily be reprogrammed to do other things.

ENIAC was just the beginning. Its two inventors formed the Eckert Mauchly Computer Corporation in the late 1940s. Working with a brilliant Hungarian mathematician, **John von Neumann** (1903–1957), who was based at Princeton University, they then designed a better machine called EDVAC (Electronic Discrete Variable Automatic Computer). In a key piece of work, von Neumann helped to define how the machine stored and processed its programs, laying the foundations for how all modern computers operate. After EDVAC, Eckert and Mauchly developed UNIVAC 1 (UNIVersal Automatic Computer) in 1951. They were helped in this task by a young, largely unknown American mathematician and Naval reserve named **Grace Murray Hopper** (1906–1992), who had originally been employed by Howard Aiken on the Harvard Mark I.

Like Herman Hollerith's tabulator over 50 years before, UNIVAC 1 was used for processing data from the US census. It was then manufactured for other users—and became the world's first large-scale commercial computer.

Machines like Colossus, the ENIAC, and the Harvard Mark I compete for significance and recognition in the minds of computer historians. Which one was truly the first great modern computer? All of them and none: these—and several other important machines—evolved our idea of the modern electronic computer during the key period between the late 1930s and the early 1950s. Among those other machines were pioneering computers put together by English academics, notably the Manchester/Ferranti Mark I, built at Manchester University by **Frederic Williams** (1911–1977) and **Thomas Kilburn** (1921–2001), and the EDSAC (Electronic Delay Storage Automatic Calculator), built by **Maurice Wilkes** (1913–2010) at Cambridge University. (5571 печ.зн.)

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*Exercise 5. Make a summary of the text and be ready to tell it*

## **THE MICROELECTRONIC REVOLUTION**

Vacuum tubes were a considerable advance on relay switches, but machines like the ENIAC were notoriously unreliable. The modern term for a problem that holds up a computer program is a "bug." Popular legend has it that this word entered the vocabulary of computer programmers sometime in the 1950s when moths, attracted by the glowing lights of vacuum tubes, flew inside machines like the ENIAC, caused a short circuit, and brought work to a juddering halt. But there were other problems with vacuum tubes too. They consumed enormous amounts of power: the ENIAC used about 2000 times as

much electricity as a modern laptop. And they took up huge amounts of space. Military needs were driving the development of machines like the ENIAC, but the sheer size of vacuum tubes had now become a real problem. ABC had used 300 vacuum tubes, Colossus had 2000, and the ENIAC had 18,000. The ENIAC's designers had boasted that its calculating speed was "at least 500 times as great as that of any other existing computing machine." But developing computers that were an order of magnitude more powerful still would have needed hundreds of thousands or even millions of vacuum tubes—which would have been far too costly, unwieldy, and unreliable. So a new technology was urgently required.



*Photo: A typical transistor on an electronic circuit board.*

The solution appeared in 1947 thanks to three physicists working at Bell Telephone Laboratories (Bell Labs). **John Bardeen** (1908–1991), **Walter Brattain** (1902–1987), and **William Shockley** (1910–1989) were then helping Bell to develop new technology for the American public telephone system, so the electrical signals that carried phone calls could be amplified more easily and carried further. Shockley, who was leading the team, believed he could use semiconductors (materials such as germanium and silicon that allow electricity to flow through them only when they've been treated in special ways) to make a better form of [amplifier](#) than the vacuum tube. When his early experiments failed, he set Bardeen and Brattain to work on the task for him. Eventually, in December 1947, they created a new form of amplifier that became known as the point-contact transistor. Bell Labs credited Bardeen and Brattain with the

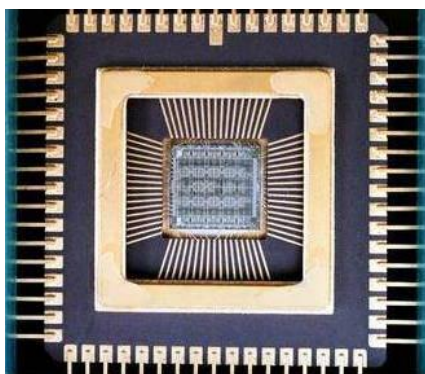
transistor and awarded them a patent. This enraged Shockley and prompted him to invent an even better design, the junction transistor, which has formed the basis of most [transistors](#) ever since.

Like vacuum tubes, transistors could be used as amplifiers or as switches. But they had several major advantages. They were a fraction the size of vacuum tubes (typically about as big as a pea), used no power at all unless they were in operation, and were virtually 100 percent reliable. The transistor was one of the most important breakthroughs in the history of computing and it earned its inventors the world's greatest science prize, the [1956 Nobel Prize in Physics](#). By that time, however, the three men had already gone their separate ways. John Bardeen had begun pioneering research into [superconductivity](#), which would earn him a second Nobel Prize in 1972. Walter Brattain moved to another part of Bell Labs.

William Shockley decided to stick with the transistor, eventually forming his own corporation to develop it further. His decision would have extraordinary consequences for the computer industry. With a small amount of capital, Shockley set about hiring the best brains he could find in American universities, including young electrical engineer **Robert Noyce** (1927–1990) and research chemist **Gordon Moore** (1929–). It wasn't long before Shockley's idiosyncratic and bullying management style upset his workers. In 1956, eight of them—including Noyce and Moore—left Shockley Transistor to found a company of their own, Fairchild Semiconductor, just down the road. Thus began the growth of "Silicon Valley," the part of California centered on Palo Alto, where many of the world's leading computer and electronics companies have been based ever since.

It was in Fairchild's California building that the next breakthrough occurred—although, somewhat curiously, it also happened at exactly the same time in the Dallas laboratories of Texas Instruments. In Dallas, a young engineer from Kansas named **Jack Kilby** (1923–2005) was considering how to improve the transistor. Although transistors were a great advance on vacuum tubes, one

key problem remained. Machines that used thousands of transistors still had to be hand wired to connect all these components together. That process was laborious, costly, and error prone. Wouldn't it be better, Kilby reflected, if many transistors could be made in a single package? This prompted him to invent the "monolithic" [integrated circuit \(IC\)](#), a collection of transistors and other components that could be manufactured all at once, in a block, on the surface of a semiconductor. Kilby's invention was another step forward, but it also had a drawback: the components in his integrated circuit still had to be connected by hand. While Kilby was making his breakthrough in Dallas, unknown to him, Robert Noyce was perfecting almost exactly the same idea at Fairchild in California. Noyce went one better, however: he found a way to include the connections between components in an integrated circuit, thus automating the entire process.



*Photo: An integrated circuit seen from the inside. Photo by courtesy of [NASA Glenn Research Center \(NASA-GRC\)](#).*

Integrated circuits, as much as transistors, helped to shrink computers during the 1960s. In 1943, IBM boss Thomas Watson had reputedly quipped: "I think there is a world market for about five computers." Just two decades later, the company and its competitors had installed around 25,000 large computer systems across the United States. As the 1960s wore on, integrated circuits became increasingly sophisticated and compact. Soon, engineers were speaking of large-scale integration (LSI), in which hundreds of components could be crammed onto a single chip, and then very large-scale integrated (VLSI), when the same chip could contain thousands of components.

The logical conclusion of all this miniaturization was that, someday, someone would be able to squeeze an entire computer onto a chip. In 1968,

Robert Noyce and Gordon Moore had left Fairchild to establish a new company of their own. With integration very much in their minds, they called it Integrated Electronics or Intel for short. Originally they had planned to make memory chips, but when the company landed an order to make chips for a range of pocket calculators, history headed in a different direction. A couple of their engineers, **Federico Faggin** (1941–) and **Marcian Edward (Ted) Hoff** (1937–), realized that instead of making a range of specialist chips for a range of calculators, they could make a universal chip that could be programmed to work in them all. Thus was born the general-purpose, single chip computer or microprocessor—and that brought about the next phase of the computer revolution.

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## **PERSONAL COMPUTERS**

By 1974, Intel had launched a popular microprocessor known as the 8080 and computer hobbyists were soon building home computers around it. The first was the MITS Altair 8800, built by **Ed Roberts**. With its front panel covered in red **LED** lights and toggle switches, it was a far cry from modern PCs and laptops. Even so, it sold by the thousand and earned Roberts a fortune. The Altair inspired a Californian electronics wizard name **Steve Wozniak** (1950–) to develop a computer of his own. "Woz" is often described as the hacker's "hacker"—a technically brilliant and highly creative engineer who pushed the boundaries of computing largely for his own amusement. In the mid-1970s, he

was working at the Hewlett-Packard computer company in California, and spending his free time tinkering away as a member of the Homebrew Computer Club in the Bay Area.

After seeing the Altair, Woz used a 6502 microprocessor (made by an Intel rival, Mos Technology) to build a better home computer of his own: the Apple I. When he showed off his machine to his colleagues at the club, they all wanted one too. One of his friends, **Steve Jobs** (1955–2011), persuaded Woz that they should go into business making the machine. Woz agreed so, famously, they set up Apple Computer Corporation in a garage belonging to Jobs' parents. After selling 175 of the Apple I for the devilish price of \$666.66, Woz built a much better machine called the Apple II (pronounced "Apple Two"). While the Altair 8800 looked like something out of a science lab, and the Apple I was little more than a bare circuit board, the Apple II took its inspiration from such things as Sony televisions and stereos: it had a neat and friendly looking cream plastic case. Launched in April 1977, it was the world's first easy-to-use home "microcomputer." Soon home users, schools, and small businesses were buying the machine in their tens of thousands—at \$1298 a time. Two things turned the Apple II into a really credible machine for small firms: a [disk drive](#) unit, launched in 1978, which made it easy to store data; and a spreadsheet program called VisiCalc, which gave Apple users the ability to analyze that data. In just two and a half years, Apple sold around 50,000 of the machine, quickly accelerating out of Jobs' garage to become one of the world's biggest companies. Dozens of other microcomputers were launched around this time, including the TRS-80 from Radio Shack (Tandy in the UK) and the Commodore PET.





*Photos: Microcomputers—the first PCs. The Apple II and The [Sinclair ZX81](#), a build-it-yourself microcomputer that became hugely popular in the UK when it was launched in 1981. Both of these machines live in glass cases at Think Tank, the science museum in Birmingham, England.*

Apple's success selling to businesses came as a great shock to IBM and the other big companies that dominated the computer industry. It didn't take a VisiCalc spreadsheet to figure out that, if the trend continued, upstarts like Apple would undermine IBM's immensely lucrative business market selling "Big Blue" computers. In 1980, IBM finally realized it had to do something and launched a highly streamlined project to save its business. One year later, it released the IBM Personal Computer (PC), based on an Intel 8080 microprocessor, which rapidly reversed the company's fortunes and stole the market back from Apple.

The PC was successful essentially for one reason. All the dozens of microcomputers that had been launched in the 1970s—including the Apple II—were incompatible. All used different hardware and worked in different ways. Most were programmed using a simple, English-like language called BASIC, but each one used its own flavor of BASIC, which was tied closely to the machine's hardware design. As a result, programs written for one machine would generally not run on another one without a great deal of conversion. Companies who wrote software professionally typically wrote it just for one machine and, consequently, there was no software industry to speak of.

In 1976, **Gary Kildall** (1942–1994), a teacher and computer scientist, and one of the founders of the Homebrew Computer Club, had figured out a solution to this problem. Kildall wrote an operating system (a computer's fundamental control software) called CP/M that acted as an intermediary between the user's programs and the machine's hardware. With a stroke of genius, Kildall realized that all he had to do was rewrite CP/M so it worked on each different machine. Then all those machines could run identical user programs—without any modification at all—inside CP/M. That would make all the different microcomputers compatible at a stroke. By the early 1980s, Kildall had become a multimillionaire through the success of his invention: the first personal computer operating system. Naturally, when IBM was developing its personal computer, it approached him hoping to put CP/M on its own machine. Legend has it that Kildall was out flying his personal plane when IBM called, so missed out on one of the world's greatest deals. But the truth seems to have been that IBM wanted to buy CP/M outright for just \$200,000, while Kildall recognized his product was worth millions more and refused to sell. Instead, IBM turned to a young programmer named **Bill Gates** (1955–). His then tiny company, Microsoft, rapidly put together an operating system called DOS, based on a product called QDOS (Quick and Dirty Operating System), which they acquired from Seattle Computer Products. Some believe Microsoft and IBM cheated Kildall out of his place in computer history; Kildall himself accused them of copying his ideas. Others think Gates was simply the shrewder businessman. Either way, the IBM PC, powered by Microsoft's operating system, was a runaway success.

Yet IBM's victory was short-lived. Cannily, Bill Gates had sold IBM the rights to one flavor of DOS (PC-DOS) and retained the rights to a very similar version (MS-DOS) for his own use. When other computer manufacturers, notably Compaq and Dell, starting making IBM-compatible (or "cloned") hardware, they too came to Gates for the software. IBM charged a premium for machines that carried its badge, but consumers soon realized that PCs were

commodities: they contained almost identical components—an Intel microprocessor, for example—no matter whose name they had on the case. As IBM lost market share, the ultimate victors were Microsoft and Intel, who were soon supplying the software and hardware for almost every PC on the planet. Apple, IBM, and Kildall made a great deal of money—but all failed to capitalize decisively on their early success.



*Photo: Personal computers threatened companies making large "mainframes" like this one. Picture courtesy of [NASA on the Commons](#) (where you can download a larger version).*

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## **THE USER REVOLUTION**

Fortunately for Apple, it had another great idea. One of the Apple II's strongest suits was its sheer "user-friendliness." For Steve Jobs, developing truly easy-to-use computers became a personal mission in the early 1980s. What truly inspired him was a visit to PARC (Palo Alto Research Center), a cutting-edge computer laboratory then run as a division of the Xerox Corporation. Xerox had started developing computers in the early 1970s, believing they would

make [paper](#) (and the highly lucrative [photocopiers](#) Xerox made) obsolete. One of PARC's research projects was an advanced \$40,000 computer called the Xerox Alto. Unlike most microcomputers launched in the 1970s, which were programmed by typing in text commands, the Alto had a desktop-like screen with little picture icons that could be moved around with a mouse: it was the very first graphical user interface (GUI, pronounced "gooey")—an idea conceived by **Alan Kay** (1940–) and now used in virtually every modern computer. The Alto borrowed some of its ideas, including the [mouse](#), from 1960s computer pioneer **Douglas Engelbart** (1925–2013).

Back at Apple, Jobs launched his own version of the Alto project to develop an easy-to-use computer called PITS (Person In The Street). This machine became the Apple Lisa, launched in January 1983—the first widely available computer with a GUI desktop. With a retail price of \$10,000, over three times the cost of an IBM PC, the Lisa was a commercial flop. But it paved the way for a better, cheaper machine called the Macintosh that Jobs unveiled a year later, in January 1984. With its memorable launch ad for the Macintosh inspired by George Orwell's novel *1984*, and directed by Ridley Scott (director of the dystopic movie *Blade Runner*), Apple took a swipe at IBM's monopoly, criticizing what it portrayed as the firm's domineering—even totalitarian—approach: Big Blue was really Big Brother. Apple's ad promised a very different vision: "On January 24, Apple Computer will introduce Macintosh. And you'll see why 1984 won't be like '1984'." The Macintosh was a critical success and helped to invent the new field of desktop publishing in the mid-1980s, yet it never came close to challenging IBM's position.

Ironically, Jobs' easy-to-use machine also helped Microsoft to dislodge IBM as the world's leading force in computing. When Bill Gates saw how the Macintosh worked, with its easy-to-use picture-icon desktop, he launched Windows, an upgraded version of his MS-DOS software. Apple saw this as blatant plagiarism and filed a \$5.5 billion copyright lawsuit in 1988. Four years later, the case collapsed with Microsoft effectively securing the right to use the

Macintosh "look and feel" in all present and future versions of Windows. Microsoft's Windows 95 system, launched three years later, had an easy-to-use, Macintosh-like desktop and MS-DOS running behind the scenes.



*Photo: The IBM Blue Gene/P [supercomputer](#) at Argonne National Laboratory: one of the world's most powerful computers. Picture courtesy of Argonne National*

*Laboratory published on [Flickr](#) in 2009 under a [Creative Commons Licence](#).*

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## **FROM NETS TO THE INTERNET**

Standardized PCs running standardized software brought a big benefit for businesses: computers could be linked together into [networks](#) to share information. At Xerox PARC in 1973, electrical engineer **Bob Metcalfe** (1946–) developed a new way of linking computers "through the ether" (empty space) that he called Ethernet. A few years later, Metcalfe left Xerox to form his own company, 3Com, to help companies realize "Metcalfe's Law": computers become useful the more closely connected they are to other people's computers. As more and more companies explored the power of local area networks (LANs), so, as the 1980s progressed, it became clear that there were great benefits to be gained by connecting computers over even greater distances—into so-called wide area networks (WANs).



*Photo: Computers aren't what they used to be: they're much less noticeable because they're much more seamlessly integrated into everyday life. Some are "embedded" into household gadgets like coffee makers or [televisions](#). Others travel round in our pockets in our smartphones—essentially pocket computers that we can program simply by downloading "apps" (applications).*

Today, the best known WAN is the [Internet](#)—a global network of individual computers and LANs that links up hundreds of millions of people. The history of the Internet is another story, but it began in the 1960s when four American universities launched a project to connect their computer systems together to make the first WAN. Later, with funding for the Department of Defense, that network became a bigger project called ARPANET (Advanced Research Projects Agency Network). In the mid-1980s, the US National Science Foundation (NSF) launched its own WAN called NSFNET. The convergence of all these networks produced what we now call the Internet later in the 1980s. Shortly afterward, the power of networking gave British computer programmer **Tim Berners-Lee** (1955–) his big idea: to combine the power of computer networks with the information-sharing idea Vannevar Bush had proposed in 1945. Thus, was born the [World Wide Web](#)—an easy way of sharing information over a computer network, which made possible the modern age of [cloud computing](#) (where anyone can access vast computing power over the Internet without having to worry about where or how their data is processed). It's Tim Berners-Lee's invention that brings you this potted history of computing today!

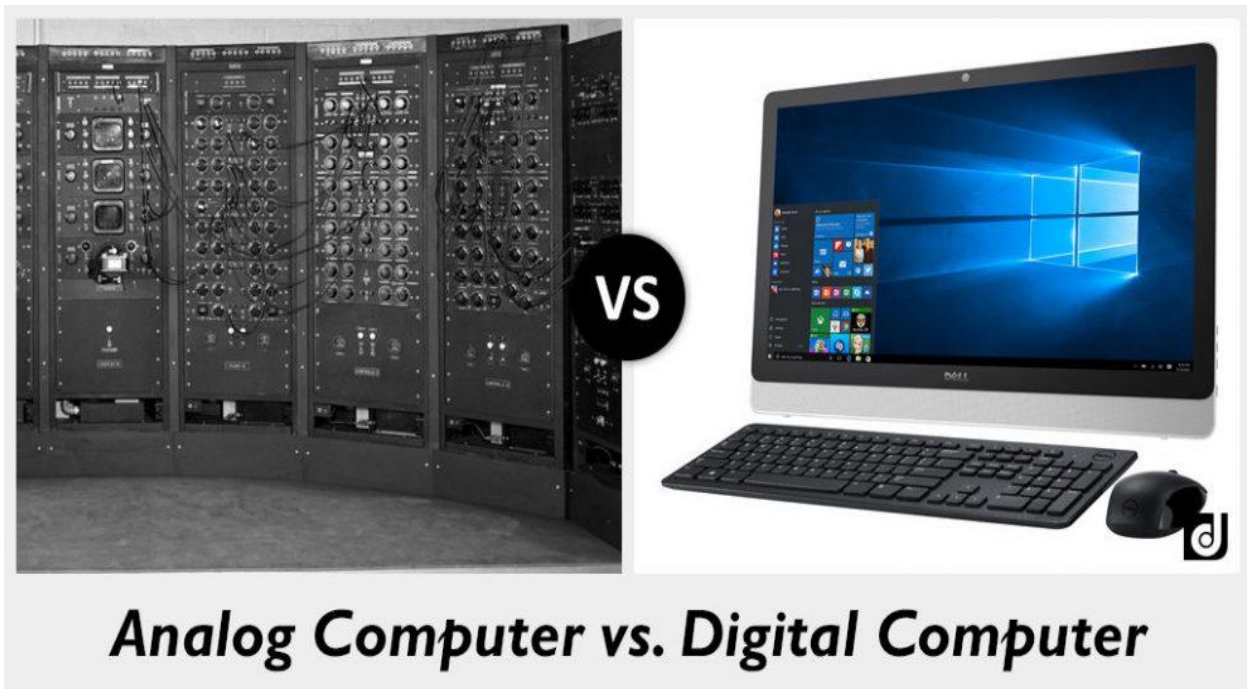
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## UNIT III. DIGITAL COMPUTERS



### Study the vocabulary

addition —	добавления
subtraction —	вычитание
multiplication —	умножения
division —	деление
operate on smth —	выполнять операцию над чем-нибудь
series —	последовательность, ряд
consecutive —	последовательный
arrangement — ,	расположение, организация
SBCS (Single-Byte Character Set)	набор однобайтовых символов



DBCS (Double-Byte Character Set)	набор двухбайтных символов
ASCII (American Standard Code for Information Interchange) —	Американский стандартный код для обмена информацией
Unicode —	стандарт кодирования символов всех национальных языков
specify —	здесь указывать
magnitude —	значение
redundant bit —	избыточный разряд
reservation —	бронирование, предварительный заказ
desktop publishing —	компьютерная верстка (печатных изданий)
control unit —	устройство управления
communications network —	сеть связи
random-access memory —	память с произвольным доступом (оперативное запоминающее устройство)
fetch —	выбирать (информацию из памяти)
effect —	здесь обеспечивать выполнение
feed (into) —	подавать, вводить (информацию, сигнал)
drive —	1) привод; 2) накопитель
disk drive —	1) дисковод; 2) дисковый накопитель
removable —	съёмный
read-only memory —	память только для чтения (постоянное запоминающее устройство)
cache —	кэш-память
highly —	очень; очень
accomplish —	достигать
oscillator —	генератор
clock rate —	тактовая частота
cycle per second —	герц

**Ex.4.2. Найдите в тексте интернационализмы. Обратите внимание на разницу в их произношении в русском и английском**

**Ex.4.3. Выпишите из текста разные части речи.**

**Ex.4.4. Изучите и выучите следующие речевые образцы.**

A

Hangars **are designed for** aircraft storage and maintenance.  
information technologies.

The book **is designed for** the Russian reader.

The engine **is designed to** operate in the Arctic region.

This course of study **is designed to** help those wishing to master

B

Young men aged **up to 25** may be called up for military service in Russia.

This sea is **up to 300 meters** deep.

This computerized room can accommodate **up to 30** students.

Fermat's theorem has not been proved **up to now**.

C

None of the existing theories can adequately explain the phenomenon **in question**.

The paper **in question** seems to be far more interesting than that submitted to the conference.

The resolution of the expert commission regarding the project **in question** was completely negative.

This is no longer **in question**.

D

A central processing unit arranged on a single chip **is referred to as** a microprocessor.

A device that converts alternating current into direct current **is referred to as** a rectifier.

Newton's first law **is often referred to as** the law of inertia.

The force that causes free electrons to move through a conductor in an orderly way **is referred to as** the electromotive force.

E

The function of such signals **is certain to depend** on the particular system.

They **are likely to know** each other well.

They **are unlikely to solve** this problem in time.

This team **is sure to win** the match.

F

Humidity in this part of the country **ranges from 55 to 80 %**.

Joysticks **range in price from 20 to 100** dollars now.

The number of spectators coming to see the matches of this football team **ranges from 10000 to 45000** per year.

The storage capacity of modern magneto-optical disks **ranges normally from 512 to 640** megabytes per cartridge.

**Ex.4.5. Дополните предложения используя следующее: be designed to/for, up to, in question, be referred to as, be unlikely, be certain, range from ... to.**

1. This error ... to be due to the programmer's lack of experience.
2. The term *analog- to-digital converter* is used to indicate that the device ... converts continuous information into discrete one.

3. The shark can live at a depth of ... 3000 meters.
4. The performance of modern supercomputer systems ... 5 GFLOPS ... 2 TFLOPS.
5. The part of mathematics that supplies formalism for digital computer design ... Boolean algebra.
6. The new method is due to increase the performance of the system ... .
7. The monitor ... display information on a television-like screen.
8. The car showed little wear; it ... to have served for seven years.
9. The book ... a wide circle of readers.
10. For the Pentium III the speeds of the chip ... 450 ... 550 MHz.
11. Floptical disks, capable of storing ... 25 MB, are very similar to highdensity floppy disks in design.
12. A skillful worker can handle ... five machines at a time.
13. A dual layer, dual sided version of the DVD can hold ... 17 gigabytes.
14. A device combining an arithmetic-logic unit and a control unit ... a central processing unit.
15. A department-server can serve ... 150 users.

**Ex.4.6. Переведите на английский, используя речевые образцы (*speech patterns A-F (ex.4.4)*).**

1. Вопрос, о котором идет речь, вызвало значительный интерес среди специалистов в области схемотехники.
2. Крейсерская скорость этого транспортного самолета становится 800-900 км / ч в зависимости от загрузки.
3. Кэш-память предназначена для хранения информации, в которой часто возникает необходимость.
4. Монитор, о котором идет речь, значительно лучше, чем тот, что мы до сих пор использовали.
5. Портативные компьютеры, выпускались в 1980-х годах, имели оперативную память до 256 килобайт и весили до 5,5 кг.

6. Производительность современных суперкомпьютеров достигает 800 MFLOPS.
7. Событие, которое может становиться, а может и нет, называют случайным событием.
8. Современные ноутбуки выпускаются весом от 1,5 до 4 кг.
9. Частота, с которой синхронизируется обработка информации в компьютере, называется тактовой частотой.
10. Это задача не такое уж и сложное. Похоже, мы справимся с ним довольно быстро.
11. Этому компьютеру уже восемь лет, он вряд ли совместим с современными устройствами.
12. Этот Дворец спорта предназначен как для проведения спортивных соревнований, так и для концертных выступлений.
13. Этот новый самолет, спроектирован и изготовлен отечественными специалистами, чтобы сделать сенсацию на международном авиасалоне.
14. Этот самолет может развивать скорость до 950 км / ч.

**Exercise 4.7. Read and translate texts.**

**TEXT 1 A DIGITAL COMPUTER DATA REPRESENTATION.**

## Data Representation



Real programmers code in binary.

**Digital data** - is a discrete representation breaking the information up into separate elements (digits, that is **0** and **1**)



One of the types of electronic computers is the digital computer. It is designed to process data in numerical (digitized) form; its circuits perform directly the mathematical operations of addition, subtraction, multiplication, and division. That's why the digital computer is called so. The numbers operated on by a digital computer are expressed in the binary system; binary digits, or bits, are 0 and 1, so that 0, 1, 10, 11, 100, 101, etc., correspond to 0, 1, 2, 3, 4, 5, etc. Binary digits are easily expressed in the computer circuitry by the presence (1) or absence (0) of a current or voltage. A series of eight consecutive bits is called a "byte"; the eight-bit byte permits 256 different "on-off" combinations. Each byte can thus represent one of up to 256 alphanumeric characters, and such an arrangement is called a "single-byte character set" (SBCS); the de facto standard for this representation is the extended ASCII character set.

Such languages, as Japanese, Chinese, and Korean, demand more than 256 unique symbols. The use of two bytes, or 16 bits, for each symbol, however, permits the representation of up to 65,536 characters or ideographs. Such an

arrangement is called a “double-byte character set” (DBCS). Unicode is the international standard for such a character set.

A digital word is sometimes the name of one or more bytes, depending on the computer’s architecture. It may specify not only the magnitude of the number in question, but also its sign (positive or negative), and may also contain redundant bits that allow automatic detection, and in some cases correction, of certain errors.

A digital computer can compare results with other data, and on the basis of such comparisons can change the series of operations it performs, can store the results of its calculations for later use,. Digital computers are used for reservations systems, scientific investigation, data-processing and word-processing applications, desktop publishing, electronic games, and many other purposes.

## **TEXT 2 IMPORTANT COMPONENTS OF A DIGITAL COMPUTER.**

A digital computer usually consists of an arithmetic-logic unit, a control unit a memory unit, input/output units, and a communications network. The arithmetic- logic unit (ALU) performs simple addition, subtraction, multiplication, division, and logic operations — such as OR and AND. The main computer memory, usually high-speed random-access memory (RAM), stores instructions and data. The control unit fetches data and instructions from memory and effects the operations of the ALU.

The control unit and the arithmetic-logic unit typically are referred to as a processor, or central processing unit (CPU). The operational speed of the CPU primarily determines the speed of the computer as a whole. The basic operation of the CPU is analogous to a computation carried out by a person using an arithmetic calculator. The control unit corresponds to the human brain and the

memory to a notebook that stores the program, initial data, and intermediate and final computational results. In the case of an electronic computer, the CPU and fast memories are realized with transistor circuits.

I/O units, or devices, are commonly referred to as computer peripherals and consist of input units (such as keyboards and optical scanners) for feeding instructions and data into the computer and output units (such as printers and monitors) for displaying results.

In addition to random-access memory, a computer usually contains some slower, but larger and permanent, secondary memory storage. Almost all computers contain a magnetic storage device known as a hard disk, as well as a disk drive to read from or write to removable magnetic media known as floppy disks. Various optical and magnetic-optical hybrid removable storage media are also quite common, such as CD-ROMs (compact disk read-only memory) and DVD-ROMs (digital video [or versatile] disk read-only memory).

Computers also often contain a cache — a small, extremely fast (compared to RAM) memory unit that can be used to store information that will be urgently or frequently needed. Current research includes cache design and algorithms that can predict what data is likely to be needed next and preload it into the cache for improved performance.

**Processing of Data.** The operations of a digital computer are carried is determined by the conditions of the inputs, usually two or more. The various circuits processing data in the computer's interior must operate in a highly synchronized manner; this is accomplished by controlling them with a very stable oscillator, which acts as the computer's "clock". Typical computer clock rates range from several million cycles per second to several hundred million, with some of the fastest computers having clock rates of about a billion cycles per second. Operating at these speeds, digital computer circuits are capable of performing thousands to trillions of arithmetic or logic operations per second, thus permitting the rapid solution of problems that would be impossible for a human to solve by hand. In addition to the arithmetic and logic circuitry and a



small number of registers (storage locations that can be accessed faster than main storage and are used to hold the intermediate results of calculations), the heart of the computer — called the central processing unit, or CPU — contains the circuitry that decodes the set of instructions, or program, and causes it to be executed.

**Ex.4.8. Найдите соответствующие выражения в тексте:**

арифметико-логическое устройство; цифровое слово; сеть связи (коммуникационная сеть) обработка текста; цифробуквенные символы; схемы компьютера; устройство управления; оперативное запоминающее устройство; двоичная система; избыточный разряд; центральный процессор; компьютерная верстка; исходные данные; научное исследование; промежуточные (окончательные) результаты вычислений; решать задачу вручную; число, о котором идет речь; реализован на транзисторных схемах; периферийные устройства; в оцифрованной форме; система предварительного заказа; устройства ввода-вывода; вводить команды в компьютер; выполнять функцию чего-либо; отражать результаты; работать синхронизировано; тактовый генератор компьютера; постоянное запоминающее устройство; ячейка памяти.

**Ex.4.9. Переведите, обращая внимание на слова, выделенные курсивом**

1. *Арифметико-логическое устройство с устройством управления образуют центральный процессор* - устройство, непосредственно выполняет машинные команды, из которых состоит компьютерная программа.

2. Благодаря высокой вычислительной мощности современные компьютеры успешно используются для задач, которые важно *решать вручную*, например, в системах предварительного запроса.

3. *Оперативное запоминающее устройство* еще и также называют рабочей памятью, поскольку он используется в процессе работы компьютера, в частности для хранения промежуточных результатов вычислений.

4. *Избыточные разряды в цифровом слове* могут содержать специальные сигнальные элементы, например, для выявления определенных ошибок.

5. *Научное исследование, о котором идет речь*, охватывает сразу несколько смежных областей знаний. 6. С помощью клавиатуры человек вводит в компьютер команды и исходные данные в оцифрованной форме.

7. *Цифробуквенные символы в двоичной системе* представлены в оцифрованной форме, то есть в виде последовательности нулей и единиц.

8. *Коммуникационная сеть* связывает все элементы компьютерной системы и соединяет ее с внешним миром.

9. Сейчас ни одно издательство не обходится без *компьютерной верстки*, необходимой для быстрой и качественной обработки текста, а также различных *периферийных устройств*.

10. Память современных компьютеров *реализована на транзисторных схемах*, которые в большом количестве сосредоточены на кристалле, называется интегрированной схемой.

11. *Устройство управления* регулирует все операции в компьютерной системе с тем, чтобы она работала синхронизовано.

12. *Чипы оперативного и постоянного запоминающего устройства* соединяются с *схемами компьютера с центральным процессором*.

**E.4.13. Answer the following questions.**



1. By what kind of circuits are digital computer operations carried out?
2. How are binary digits expressed in the computer circuitry?
3. How wide is the range of computer clock rates? What do these speeds permit?
4. What accounts for the term *digital computer*?
5. What are the main components of a digital computer? What functions do they perform?
6. What does the use of two bytes allow?
7. What is a byte? What does it permit?
8. What is a digital word? What kinds of information may it contain?
9. What is a processor? What is its basic operation analogous to?
10. What is referred to as computer peripherals?
11. What is the function of a computer's clock?
12. What kind of circuitry, apart from the arithmetic and logic ones, does the CPU contain?
13. What sorts of systems are digital computers used for?
14. What storage devices does a computer contain in addition to RAM? Dwell on them.

**Ex.4.14. Give derivatives of the following words and explain their meanings.**

add, communicate, simple, condition, depend, detect, correct, determine, differ, extend, divide, effect, move, err, compare, frequent, multiply, Numerate, specify, sign,

**Ex. 4.15.** *Give the antonyms of the following words taken from text 4.1. Make up sentences of your own using them.*

addition, automatic, by hand., directly, easily, extended, frequently, improved, initial, multiplication, needed, permanent, permit, presence, primarily, redundant, secondary, single, interior, synchronized, typically, unique,

**Ex.4.16.** *Найдите в тексте 4.1 и переведите следующие выражения:*

value; symbol; similar; necessitate (demand; call for); being discussed (spoken about; given); allow (make (it) possible; let; enable).be termed (be referred to as; be said to be; be spoken of as); be intended for/to (be meant for/to); achieve (attain); lie in the range between ... and ... (be in the range between ... and ...; vary from ... to ...);

**Ex.4.17.** *Paraphrase the following sentences replacing the italicized words by their equivalents from text 4.1.*

**Model :** A rectangular arrangement of data *is referred to as* a matrix.

— A rectangular arrangement of data *is called* a matrix

1. Typically, in summer the temperature in this part of the country *lies in the range between 22 and 35 °C.*
2. Together, a control unit and an arithmetic-logic unit *are termed* a processor.
3. The values of the function  $y = \cos x$  *vary from -1 to +1.*

4. The *value* of electromotive force depends on the conditions at the source, such as the number of magnetic lines of force per time unit.
5. The use of a low-noise amplifier *allows achieving* a high signal/ noise ratio.
6. The term *altimeter* means that the *given* device *is intended* for measuring altitude.
7. The suggested approach *enables* us to significantly increase the fault-tolerance of computer hardware.
8. The subject *being discussed* is of the greatest importance for specialists in computer security.
9. The situation *called for* prompt action.
10. The new approach *makes it possible* to find the *value* of the output signal at any point in time.
11. No improvement was *achieved* by applying this method.
12. Most terminals are desktop size and *are not meant* to be carried around.
13. Modern digital computers handle numbers, letters as well as other *symbols*.
14. Changes to the system, such as using a new hardware platform or adding new sensors, may *necessitate* modifications in the entire data transfer protocol.
15. An ammeter *is meant* for measuring electric current.
16. A great number of colours in computer graphics were *attained* by assigning more than one binary bit per pixel.
17. A cooler *is intended* to prevent the computer from overheating.
18. A communications network that links all the elements of a computer system and connects it to the external world *is spoken of as* a bus.
19. A CD-ROM is *similar* in size and shape to a musical compact disk.

**Ex. 4.19. Discuss the following points.**

1. The main components of a digital computer.
2. Data representation in a digital computer.
3. Data processing in a digital computer.

**Ex. 4.20. Choose the correct word.**

**A**

**operate — operate on**

1. This engine ... diesel fuel.
2. This device is ... by alternating current.
3. The patient has been ... for appendicitis.
4. The company ... three factories and a coal-mine.
5. Can you ... a truck?

**B**

**present — represent**

**presentation — representation**

1. The film ... one of the versions of the downfall of the Roman Empire.
2. The ... of the new book on computer technologies is to be held at the Mc Grow Hill Publishing House next Thursday.
3. Linear functions such as  $y = ax + b$  are ... by straight lines.
4. Graphical ... of a function allows us to see its character more clearly compared with its analytical expression.
5. A computer ... an important item of nearly all manufacturing process control systems.

**C**

**consecutive — subsequent (succeeding) — series**

1. The explanations were arranged in a ... order.
2. The operation of the system was checked during three ... two-hour runs.

3. The total resistance in a ... circuit is equal to the sum of the individual resistances.
4. The treaty will come into effect after its ... ratification by the parliaments of both countries.
5. This problem is likely to be solved by ... generations.

## D

### character — symbol — sign

1. A character generator is a device that converts a ... code into graphical form.
2.  $Au$  is a ... for gold.
3. In this expression  $I$  is a ... of a unitary matrix.
4. Newton's third law states that two opposing forces are equal in magnitude but opposite in ...
5. Violence is a ... of weakness or fear, not a ... of strength or confidence.

## E

### extend — expand

### extension — expansion

1. For the ... of the voltmeter measurement range, a series resistor is applied.
2. Function  $f(x)$  can be ... in a Taylor series.
3. Metals ... when they are heated.
4. The ... of the railway line to the sea port facilitated significantly the delivery of goods to remote parts of the country.
5. The flag ... in the breeze.
6. This rule can be ... step by step to give the sum of any finite number of matrices.

## F

### effect ( $v, n$ ) — affect ( $v, n$ )

1. All our arguments had no ... on them.

2. Broadcasting is ... by emitting electro-magnetic waves of high frequency.
3. Some plants are quickly ... by cold.
4. System designers are to incorporate remote, distributed, or highly reliable features without adversely ... system performance.
5. The new tax regulations came into ... at the beginning of the year.

## **G**

**research (n) — investigation (study) (n)**

**research (v) — investigate (study) (v)**

1. ... students usually supplement their income by teaching.
2. Professor Blake is ... for a new book now.
3. The object to be ... was placed in a magnetic field.
4. The professors of our university often participate in ... conferences.
5. Their proposal is being ....

### **Topics for Essays,**

#### **Oral or Written Reports**

1. To be or not to be computer literate?
2. Advantages and disadvantages of computers.
3. How will computers influence on our lives in future?
4. Discoveries, inventions, new products, and their effects (good and evil).



# FUN TIME

## COMPUTER PARTS UNSCRAMBLE THE WORDS

Unscramble the computer parts vocabulary and number the pictures



1. rtmooni \_\_\_\_\_
2. ctoprume scae \_\_\_\_\_
3. kradoyeb \_\_\_\_\_
4. meosu \_\_\_\_\_
5. emcawb \_\_\_\_\_
6. cnpoehirom \_\_\_\_\_
7. rkeespas \_\_\_\_\_
8. osephndae \_\_\_\_\_
9. rnrteip \_\_\_\_\_
10. bceasl \_\_\_\_\_
11. hflas ievdr \_\_\_\_\_
12. cannres \_\_\_\_\_
13. VDD beurnn \_\_\_\_\_
14. DDV \_\_\_\_\_
15. hrda skdi \_\_\_\_\_
16. eorwp upslpy \_\_\_\_\_

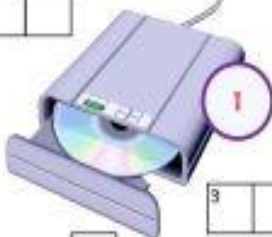
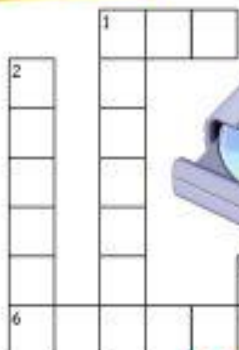
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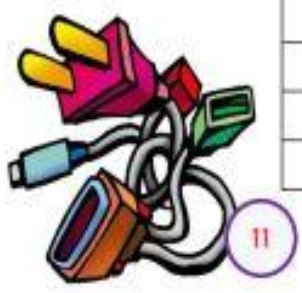
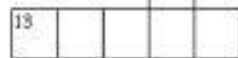
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# COMPUTER PARTS CROSSWORD PUZZLE

Look at the numbers on the pictures and write the computer parts vocabulary in the crossword puzzle



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## Порядок слов английского предложения



- Первым правилом английского языка можно считать **правило о твердо установленном порядке слов** :

1)Подлежащее

2)Сказуемое

3)Дополнения

4)Обстоятельства времени/ места.

Такой порядок слов называется **ПРЯМЫМ**.

В английском языке встречаются и отступления от обычного порядка слов в предложении.

- - **Вопросительные предложения.**
- - **Предложения с оборотом there+to be.**

### Word Order

Subject	Helping verbs	Frequency adverbs	Main verbs	Object	Adverbs of manner	Adverbs of place	Adverbs of time
I	am	sometimes	go	me	badly	at school	yesterday
You	is	always	eat	you	quickly	at home	every day
He	are	usually	play	him	rapidly	in class	tomorrow
She	was	often	live	her	beautifully	on farm	in Aban
It	were	never	read	it	carefully	at university	in winter
We	can	hardly	write	us	carelessly	in the field	on Monday
They	could	rarely	drive	them	hard	on land	last night

## Word order Порядок слов

Когда?	Кто?	Как часто?	Что делает?	Где?	Когда?
	She	Always Often Usually sometimes	dances	In the club	
Every day, In the evening On Sunday In the morning					

## Word Order in the Declarative Sentence



Subject + Predicate + Objects + Adverbial Modifiers

(подлежащее)    (сказуемое)    (дополнения)    (обстоятельства)

1                      2                      3                      4

Our teacher is explaining the students a new grammar rule now.

1                      2                      3                      3                      4

## Word order is fixed in English

Compare:

- e.g.: Mrs. Winter (*the subject*) sent the little boy (*the object*) with a message to the next village one December day.
- e.g.: The little boy (*the subject*) sent Mrs. Winter (*the object*) with a message to the next village one December day.

These examples show the meaning of the fixed word order in the English language.

# EXERCISES

## Word Order in affirmative Sentences

**Exercise 1** Arrange the words to make affirmative sentences.

1. to/ like/talk / I / you/ to/
2. bad/French / I / speak/extremely/really
3. hates/they/noise/ when/people/he/make
4. they/ night / song / a / sing/every
5. 8'o clock/sell / flowers / we/till
6. anytime/ see / me / you / can/want/you
7. the/buy / milk / he/for / wants/to/baby
8. feed / you / my / cat / can
9. sister /has /my /got /a dog/ugly/dangerous
10. now/must / the book / read / you/carefully

**Exercise 2** Составьте утвердительные предложения, обращая внимание на место обстоятельства времени в предложении

1. go / now / home / will / I
2. give /the present /tomorrow /we /him / will
3. her / met / last night / at / we / the station
4. was / last week / he / in hospital
5. in /Greece / spend / I / will / next year / my holiday
6. must /at five o'clock / leave / we / the house
7. the library /take / I /the book /will /today / to
8. my mum / breakfast / in the morning / made
9. tonight / want / to the cinema / to go / we

# Отрицательное предложение

Подлежащее	Вспомогательный глагол + not	Сказуемое	Дополнение			Обстоятельство	
			Косвенное без предлога	прямое	Косвенное с предлогом	места	Времени
We	don't	study		medicine			
I	don't	go				to the college	every day
The professor	doesn't	deliver		lectures	to the students		
The teacher	doesn't	give	us	all the important themes			

В отрицательной форме частичка **not** присоединяется к вспомогательному глаголу

I (you, we, they) don't write a letter

He (she) doesn't write a letter

## Word Order in Negative Sentences

Составьте отрицательные предложения, обращая внимание на место обстоятельства времени в предложении

1. will/our holiday/ at home/we/not/ spend/ next year
2. at/did/I/him/see/not/last/nigh/ disco/the
3. a/ going/ are/tonight/party/ not/to/we
4. will/a/ letter/week/ not/ next/send/ you/she
- 5.the/did/you/tell/he/not/this/truth/morning

## Типы вопросов

- **1.Общий вопрос.**  
General question (Yes/No question)
- **2. Альтернативный вопрос** или вопрос выбора (**or**).  
Alternative question.
- **3. Специальный вопрос** (начинается со специального вопросительного слова: **Where / What / Why** и т.д.)  
Special question (**Wh** - question).
- **4. Вопрос к подлежащему.** (Начинается с вопросительного слова **Who / What**, в зависимости от того одушевленный или неодушевленный предмет является подлежащим).
- **5.Разделительный вопрос.**  
Tag-question(не так ли).



## ТИПЫ ВОПРОСИТЕЛЬНЫХ ПРЕДЛОЖЕНИЙ

ТИПЫ ВОПРОСОВ		
<b>Общие</b>	<b>Are you at school?</b>	<b>Do you go to school?</b>
<b>Альтернативные</b>	<b>Are you at school or at home?</b>	<b>Do you go to school or to the park ?</b>
<b>Разделительные</b>	<b>You are at school, aren't you?</b>	<b>You go to school, don't you?</b>
<b>Специальные</b>	<b>Where are you?</b>	<b>Where do you go?</b>
<b>Вопросы к подлежащему</b>	<b>Who is at school?</b>	<b>Who goes to school?</b>

## Special question

Вопросительное  
слово

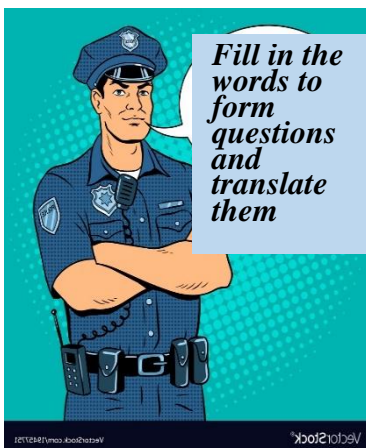
спомогательный  
(модальный)  
глагол

подлежащее сказуемое ...



<p>When Where What Which Why Whose Whom How</p> <p>How many How much How long</p>	<b>To be</b>	<p><b>Where</b> am I?</p> <p><b>What</b> is <u>she</u>?</p> <p><b>Where</b> are <u>you</u>?</p>
	<b>Present Simple</b>	<p><b>What</b> rules <b>do</b> <u>you</u> <u>discuss</u> at school?</p> <p><b>What</b> does <u>she</u> <u>take care of</u>?</p> <p><b>Whom</b> did <u>you</u> <u>invite</u> to the party?</p>
	<b>Past Simple</b>	<p><b>When</b> did <u>you</u> <u>take</u> a picture of a lizard in the zoo?</p>
	<b>Future Simple</b>	<p><b>Why</b> will <u>Mary</u> <u>arrange</u> a picnic for her friends tomorrow?</p>
	<b>Can May Must</b>	<p><b>Whose</b> book <b>can</b> I <u>take</u>?</p> <p><b>Where</b> may I <u>close</u> the window?</p> <p><b>Why</b> must I <u>do</u> this exercise?</p>

**Ex. 1.** Fill in the words to form questions and translate them. Point the type of question in brackets.



**did, are, do, have, was, haven't, is, isn't**

1. What types of books \_\_\_\_\_ you like to read?
2. \_\_\_\_\_ she reading love story or an adventure story?
3. \_\_\_\_\_ you seen «Titanic»?
4. Who \_\_\_\_\_ watching TV at eight o'clock last night?
5. It's an exciting book, \_\_\_\_\_ it?
6. \_\_\_\_\_ you going to watch a romantic film or a musical?
7. You have seen this film, \_\_\_\_\_ you.
8. \_\_\_\_\_ you go to the cinema last night?





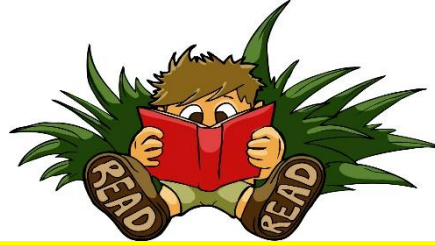
**Ex. 2. Form questions.**

1. birthday / is / when / your?
2. many / How / cards / did / get / you?
3. do / What / like / you / presents?
4. mum / What / make / did / cake / your?
5. at the party / you / did / what / do?
6. like / you / parties / do / Why?
7. summer / are / this / where / you / going?
8. there / going / How / you / are?
9. take / going / to / what / you / are?
10. with / are / you / Who / going?
11. do / going / to / you / there / What / are?
12. you / stay / going / to / are / Where?
13. what / playing / dad / sports / your / games / is / of / fond?
14. roller-skate / when / learn / you / to / did?
15. of / afraid / are / swimming / you?

**Ex. 3. Correct the mistakes.**



1. What Tony is writing?
2. What is writing?
3. What Julia want to do?
4. Who does wants a cup of tea?
5. Who President John F. Kennedy killed?
6. Who did invented the telephone?
7. Whose your favorite actor?
8. Who's is this coat?
9. What hand do you write with?
10. Arthur is 21, hasn't he?
11. You're a student, isn't it?
12. They live in Milan, doesn't it?



## 4.SUPPLEMENTARY READING

### The Invention of the Floppy Disk Drive

#### *I. Pre-reading task*

*Answer the following questions:*

1. What kind of disk is called “floppy”?
2. How did the word “floppy” come into being?
3. When did the first floppies appear?
4. What devices are floppies being replaced now?

#### *II. Read the text and check your answers.*

The floppy disk was invented by IBM engineers led by Alan Shugart.

In 1971, IBM introduced the first "memory disk", as it was called then, or the "floppy disk" as it is known today.

#### *8-inch Floppy Disk*

The first floppy was an 8-inch flexible plastic disk coated with magnetic iron oxide; computer data was written to and read from the disk's surface.

The nickname "floppy" came from the disk's flexibility. The floppy disk was considered a revolutionary device in the "History of Computers" for its portability which provided a new and easy physical means of transporting data from computer to computer.

Inventor Alan Shugart

The "floppy" was invented by IBM engineers led by Alan Shugart. The first disks were designed for loading microcodes into the controller of the Merlin (IBM 3330) disk pack file (a 100 MB storage device). So, in effect, the first floppies were used to fill another type of data storage device. Overnight,

additional uses for the floppy were discovered, making it the hot new program and file storage medium.

### How Does a Floppy Work?

A floppy is a circle of magnetic material similar to other kinds of recording tape such as cassette tape; one or two sides of the disk are used for recording. The disk drive grabs the floppy by its center and spins it like a record inside its housing. The read/write head, much like the head on a tape deck, contacts the surface through an opening in the plastic shell, or envelope. The first Shugart floppy held 100 KBs of data. First-hand account of how the operating system for the 8-inch disk was written.

### *5 1/4-inch Floppy Disk*

In 1976, the 5 1/4" flexible disk drive and diskette was developed by Alan Shugart for Wang Laboratories. Wang wanted a smaller floppy disk and drive to use with their desktop computers. By 1978, more than 10 manufacturers were producing 5 1/4" floppy drives that stored up to 1.2MB (megabytes) of data.

One interesting story about the 5 1/4-inch floppy disk is how the size was decided. Engineers, Jim Adkisson and Don Massaro were discussing the size with An Wang of Wang Laboratories. The trio just happened to be doing their discussing at a bar. An Wang motioned to a drink napkin and stated "about that size" which happened to be 5 1/4-inches wide.

### *3 1/2-inch Floppy Disk*

In 1981, Sony introduced the first 3 1/2" floppy drives and diskettes. These floppies were encased in hard plastic, however, the name stayed the same. They stored 400kb of data, and later 720K (double-density) and 1.44MB (high-density).

### Post Floppy Disk

For the most part, recordable CDs and DVDs, and flash drives have replaced floppies as the means of transporting files from one computer to another computer.

***III. Translate into Russian the following:***

1. an opening in the plastic shell;
2. coated with magnetic iron oxide;
3. desktop computers;
4. file storage medium;
5. portability;
6. Recordable;
7. the means of transporting files.
8. the read/write head;
9. to be designed for;
10. to be encased in hard plastic;
11. to spins it like a record;

***IV. Translate the following words and from derivatives that can be found in the text:***

1) flexible; 2) revolution; 3) portable; 4) to add; 5) to record; 6) to manufacturer; 7) case.

**INTRODUCTION TO ANALOG AND DIGITAL ELECTRONICS**

The physical environment in which we live is characterized by *analog quantities*, that is, quantities that change in a continuous fashion and are not restricted to a small number of discrete values. Temperature, position, light intensity, sound waves, colors, textures—our world is filled with gradations and displacements and variations that do not fit into restricted measurement systems such as “on vs. off,” “small vs. big,” “black vs. white,” or “soft vs. hard.” When we use a plot to visually represent the values of these analog quantities, the curve will be smooth.

## Digital Systems

If the world is an analog place, why do we hear so much about digital technology these days? How can we speak of a “digital revolution” if the human experience is still fundamentally analog? It turns out that engineered systems can provide vastly superior performance and functionality when electrical portions of these systems store, transmit, and process information using signals that are restricted to two values: on and off, otherwise known as one and zero.

Though the word “digital” refers in a general way to systems involving a limited set of discrete values, in the context of modern electronics, “digital” implies **binary**. In binary calculations, the only available digits are one and zero, and this mathematical construct is translated into the electronic domain through the use of digital circuitry in which voltages are always “high” or “low.”

In typical single-ended digital circuits, a **logic-high** signal has a voltage that is close to (ideally, equal to) the circuit’s supply voltage, and a **logic-low** signal has a voltage that is close to (ideally, equal to) the circuit’s ground voltage. Since the ground node is the reference for all voltages in the system, we say that logic low is 0 V.

In many applications, digital storage, transmission, and processing are so advantageous that electrical engineers employ digital techniques even when this creates a need for additional circuitry that converts analog quantities to digital quantities and then digital quantities back to analog quantities. We’ll learn more about analog-to-digital converters and digital-to-analog converters in a later chapter.

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation.*

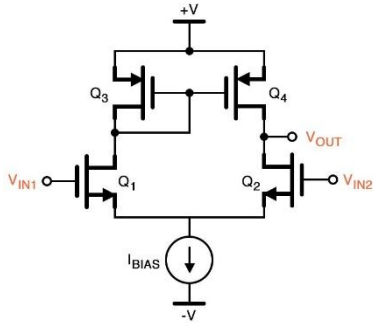
*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

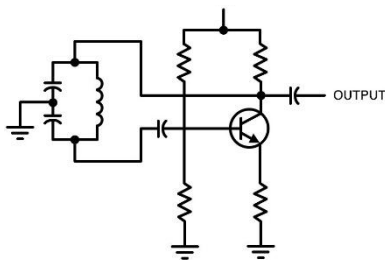
## Analog and Digital ICs

Nowadays, a large proportion of the activity performed by an electronic device occurs inside integrated circuits. Consequently, the difference between analog and digital circuits is rooted in the difference between analog and digital *integrated* circuits.

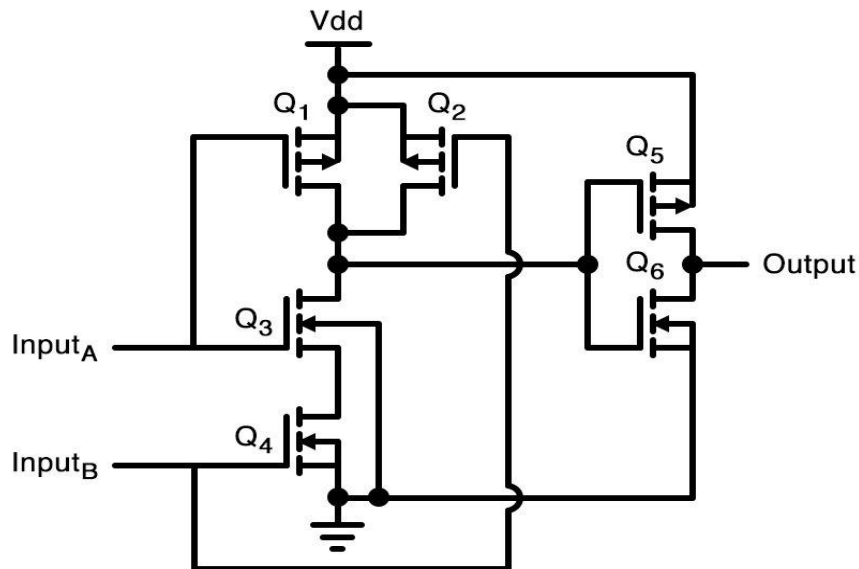


Analog and digital ICs contain the same basic components: primarily transistors, but also diodes and passive elements. However, in analog ICs, transistors are intended to amplify or produce continuously varying signals. When we **bias** a transistor, we create circuit conditions that allow it to properly respond to small changes in voltage. For example, an input stage of an amplifier IC might employ the MOSFET differential-pair configuration shown below; note that the current source ( $I_{BIAS}$ ) is biasing the Q1 and Q2 transistors.

The next circuit, called a Colpitts oscillator, uses a biased bipolar junction transistor to generate a sinusoidal signal.



Digital ICs, in contrast, are designed in a way that allows input signals to turn transistors fully on or fully off. Whereas both MOSFETs and BJTs are found in analog ICs, the vast majority of transistors in digital ICs are MOSFETs. Designers interconnect MOSFETs in order to form relatively simple circuits that implement basic Boolean logic functions, and these **logic gates** can then serve as the building blocks for higher-level digital circuits such as flip-flops and even for exceedingly complex circuits such as microprocessors.



*This diagram shows a MOSFET implementation of the Boolean AND function.*

### Recap

The physical world is analog, but digital techniques are often far superior than analog techniques in the context of electronic design.

- Digital circuits have signals that transition between logic high, which represents binary 1, and logic low, which represents binary 0.
- Analog ICs use BJTs and MOSFETs that are biased so that they can respond to small, smoothly varying input signals.
- Digital ICs use MOSFETs that are driven fully on or fully off and that are interconnected into a wide variety of simple and complex circuits.

***Exercise 1. Read and translate the text***

***Exercise 2. Write down unknown words and word-combinations with transcription and translation.***

***Exercise 3 Put 10 special questions to the text***

***Exercise 4. Discuss with your group-mates main problems of the text.***

***Exercise 5. Make a summary of the text and be ready to tell it***

## IV. PERSONAL COMPUTERS

### Персональные компьютеры.

- 1972 – Atari
- 1976 – Apple I
- 1977 – Apple II
- 1981 – IBM PC
- 1982 – ZX Spectrum
- 1984 – Amiga
- 1984 – Macintosh
- 1986 – ноутбук IBM



**Ex. 1.** Read new words and word combinations and memorize them.

appliance-устройство; прибор

application software/прикладные программы

CAI - автоматизированное обучение

СМІ - компьютерное обучение

competitive operating systems - конкурирующая операционная система

computer of choice - лучший компьютер

leisure- досуг

maintenance-сохранение; эксплуатация



PC(personal computers)/персональные компьютеры

record keeping – регистрация

scheduling- составление расписания, графика

security/безопасность; охрана

telephone dialing - набор номера телефона

to delete/удалять; стирать; очищать память

to enter the fray/ ввязаться в драку

to fall by the wayside - уступить дорогу

to give an impetus – стимулировать (что-л.)

to meet the demands - удовлетворять потребности

to move paragraphs around/менять местами абзацы

to survive onslaught - выдержать конкуренцию

**Ex. 2.** The following terms you should learn.

computer-assisted instructions - компьютерные команды

CRT - электронно-лучевая трубка, ЭЛТ

grading - оценивание; классификация

hard-copy output-вывод "твердой" печатной копии

input media - носитель для входных данных

LCD - жидкокристаллический дисплей

offline storage-автономное хранение данных отдельно от компьютера

online storage-неавтономное хранение данных в ЗУ

output media - носитель для выходных данных

word processing - обработка текста

word size - размер слова; разрядность двоичного слова

worksheet- электронная таблица

## **1.A PERSONAL COMPUTER: DEFINITION, ORIGIN**

### *READ AND TRANSLATE THE TEXT*

#### **TEXT 1 WHAT IS A PC?**

PC are supposed to appear in the late 1970s. One of the first and most popular personal computers was the Apple II, introduced in 1977 by Apple Computer. During the late 1970s and early 1980s, new models and competitive operating systems seemed to appear daily. Then, in 1981, IBM entered the fray with its first personal computer, known as the IBM PC. The IBM PC quickly became the personal computer of choice, and most other personal computer manufacturers fell by the wayside. One of the few companies to survive IBM's onslaught was Apple Computer, which is sure to remain a major player in the personal computer marketplace. In less than a decade the microcomputer has been transformed from a calculator and hobbyist's toy into a personal computer for almost everyone.

What is a personal computer? How can this device be characterized?

- Firstly, a personal computer being microprocessor-based, its central processing unit, called a microprocessor unit, or MPU, is concentrated on a single silicon chip.
- Secondly, a personal computer uses smaller, less expensive, and less powerful input, output and storage components than do large computer systems. Most often, input is by means of a keyboard, soft-copy output being displayed on a cathode-ray tube (CRT) screen or liquid crystal display (LCD). Hard-copy output is produced on a low-speed character printer.
- A Personal Computer employs disks (or flash memory drives) as the principal online and offline storage devices and also as input and output media.
- At last, a Personal Computer is a general-purpose, stand-alone system that can begin to work when plugged in and be moved from place to place.

Perhaps the most distinguishing feature of a personal computer is that it is used by an individual, usually in an interactive mode. Regardless of the

purpose for which it is used, either for leisure activities in the home or for business applications in the office, we can consider it to be a personal computer.

**Ex. 3. Give answer to the following:**



## Questions and Answers

1. How can computers be used in education?
2. How is input carried out in personal computers?
3. What are the four main characteristics of a PC?
4. What are the main spheres of PC application?
5. What are the typical word sizes of a PC?
6. What changes in the typed text can you make using a display?
7. What differs personal computers from large computer systems?
8. What does the term "microprocessor-based" mean?
9. What is "a word processing program"?
10. What is a personal computer?
11. What kind of a system is a PC?
12. What other home and hobby applications, except computer games, can you name?
13. What principle storage devices do PC use?

## ***VOCABULARY EXERCISES***

**Ex. 4.** Find the English equivalents.

1. вывести на экран; автономная система;
2. главный поставщик на компьютерном рынке;
3. игрушка для любителя; микропроцессорный;
4. интерактивный режим; область применения;
5. исправлять ошибки и стирать предложения;
6. компоненты меньшей мощности;
7. компьютерное моделирование; электронные таблицы.
8. Конкурирующая операционная система;
9. обработка текстов;
10. прикладные программы;
11. способности компьютера;

**Ex. 5.** Find in the two given texts words:

### **A) synonyms**

**Adjectives:** flexible; main; little; general.

**Nouns:** rate; use; plays; control; mode; producer; amateur; device; crystal; error; storage; primary (memory); monitor; characteristic; aim.

**Verbs:** to print; to produce; to convert; to keep; to found; to erase; to name; to change; to use; to start; to switch on; to supply; to give possibility; to involve.

### **B) antonyms**

**Adjectives:** cheap, weak; common; general; large; soft; high; easy.

**Nouns:** online, input, work.

**Verbs:** to finish; to switch on; to take; to delete.

**Ex. 6.** Insert the necessary words.

1. Very soon a microcomputer was \_\_\_\_\_ from a calculator into a PC for everyone.
2. Using a display you can \_\_\_\_\_ mistakes, \_\_\_\_\_ words and replace sentences.
3. Personal computers have a lot of \_\_\_\_\_, scientific, engineering, educational being among them.
4. PCs have a great \_\_\_\_\_ upon pupils, educators, and many other people no matter what their occupation is.
5. One of the first and most popular PC was \_\_\_\_\_ in 1977.
6. Input in PC is usually performed by means of a \_\_\_\_\_.
7. All PCs are based on \_\_\_\_\_ technology, its CPU being called MPU.
8. A word processing program called application \_\_\_\_\_ enables you to modify any document in a manner you wish.
9. A personal computer uses \_\_\_\_\_ disks as input and output media.
10. A personal computer is a small relatively inexpensive device for an individual \_\_\_\_\_.

**Ex. 7.** Give definitions to these abbreviations using the vocabulary.

ALU; CAI.CD; CMI; CPU; CRT; CU; DOS; I/O; IBM; IC; IOP; LSI; MP; MPU; MSI; PC; PU; RAM; ROM; SSI..

**Exercise 8.** Составьте диалог.

Your friend asks you to tell about Personal computers.

**Ex. 9.** Speak on Personal computers and its influence.

## TEXT 2 THE HISTORY OF PERSONAL COMPUTERS



1984  
Macintosh



1986  
Macintosh Plus



1987  
Macintosh II



1987  
Macintosh SE



1989  
Macintosh IIfx



1989  
Macintosh IIfx



1990  
Macintosh Classic



1990  
Macintosh IIfx



1990  
Macintosh LC



1993  
Macintosh Centris



1993  
Macintosh TV



1995  
Macintosh LC



1998  
iMac



1999  
iMac DV



2001  
iMac Patterns



2002  
iMac



2004  
iMac G5



2006  
iMac Slimmer Intel



2007  
Novo iMac



*1. Memorize the words*

chassis – шасси; рама; ходовая часть

to pin down – **зд.** применяться; подходить

general purpose – универсальный; общего назначения

slot – гнездо; разъем

expansion slot – разъем для модуля расширения

spreadsheet – печатный лист

to enter the fray – **зд.** появиться

onslaught – бешеная атака, нападение

to survive onslaught – выдержать конкуренцию

plug – штепсель; вилка; штекер; подключать; подсоединять

aside from – помимо; за исключением (*амер.*)

handwriting recognition – распознавание почерка

thereafter – после этого; впоследствии; соответственно

price tag – ярлык (с указанием цены)

compatible – совместимый

to fade – **зд.** исчезать

word processing – редактирование текстов



## What is a Personal Computer?

- A **personal computer** is a type of microcomputer designed to meet the computing needs of an individual
  - Desktop computers
  - Notebook (or “laptop”) computers
  - Cost starts at \$500, but most spend \$1000 to \$1200



2. Read the text and speak about personal computer types:

On June 5, 1977, the fledgling company Apple from Cupertino (California) put a personal computer on the market. The now-mythical **Apple II** was **not the first product from the firm founded by Steve Jobs and Steve Wozniak**, nor was it the first personal computer. And, of course, there were no crowds amassed at the gates of their establishments waiting to purchase it. But over time it would become “one of the most successful products of all time,” in Wozniak’s words. But above all, it was the first big step along a path that led to building one of the most recognizable brands in the world.

In the 1970s, Silicon Valley was a vibrant nucleus of innovation that provided components to a powerful computing industry controlled by large corporations and institutions. At that time, **computers were still big and expensive machines**. Outside the corporate sphere, only a handful of enthusiasts had the knowledge to manage these technologies and to know what to do with them.



According to what computer historian David Greelish, author of *Classic Computing: The Complete Historically Brewed*, explained to OpenMind, **“the microcomputer revolution arose independently from the computer industry.”** It was hobbyists that started building the first personal computers using parts such as the first chips manufactured by Intel. In 1975, the first computer that achieved commercial success came on the market, the Altair 8800, which could be purchased already assembled. However, the usual thing was that these do-it-yourself amateurs bought kits to assemble. “It was only of interest to electronic hobbyists because it was difficult to use,” Michael R. Williams, an emeritus professor at the University of Calgary in Canada and author of *A History of Computing Technology*, told OpenMind.

However, the Apple II did not immediately triumph: “Initially the Apple II was not a big seller,” says Cohen. According to this expert, there were two new advances that subsequently boosted its popularity. The first was Disk II, a cheap and reliable floppy disk drive designed by Wozniak and launched in 1978 to replace the cassette interface.

In turn, this innovation allowed the introduction the following year of an Apple version of VisiCalc, today considered the first killer app, a term used to designate programs that induce users to buy the hardware needed to use them. Developed by VisiCorp, a software publishing company, **VisiCalc was “the first real spreadsheet on a small computer which was only available on the Apple II with a disk drive at the time,”** says Cohen. “With VisiCalc, small businesses and medium size businesses could justify buying a computer and Apple’s sales exploded.” Apple computers then began to spread to schools and homes. For Williams, had there not been VisiCalc, “the Apple II would have likely gone the way of others into oblivion.”

## 2. PERSONAL COMPUTER TYPES

# Types of Computers Personal Computers

- Desktop computer
- Laptop/Notebook/Netbook
- Tablets/iPad
- Smartphones



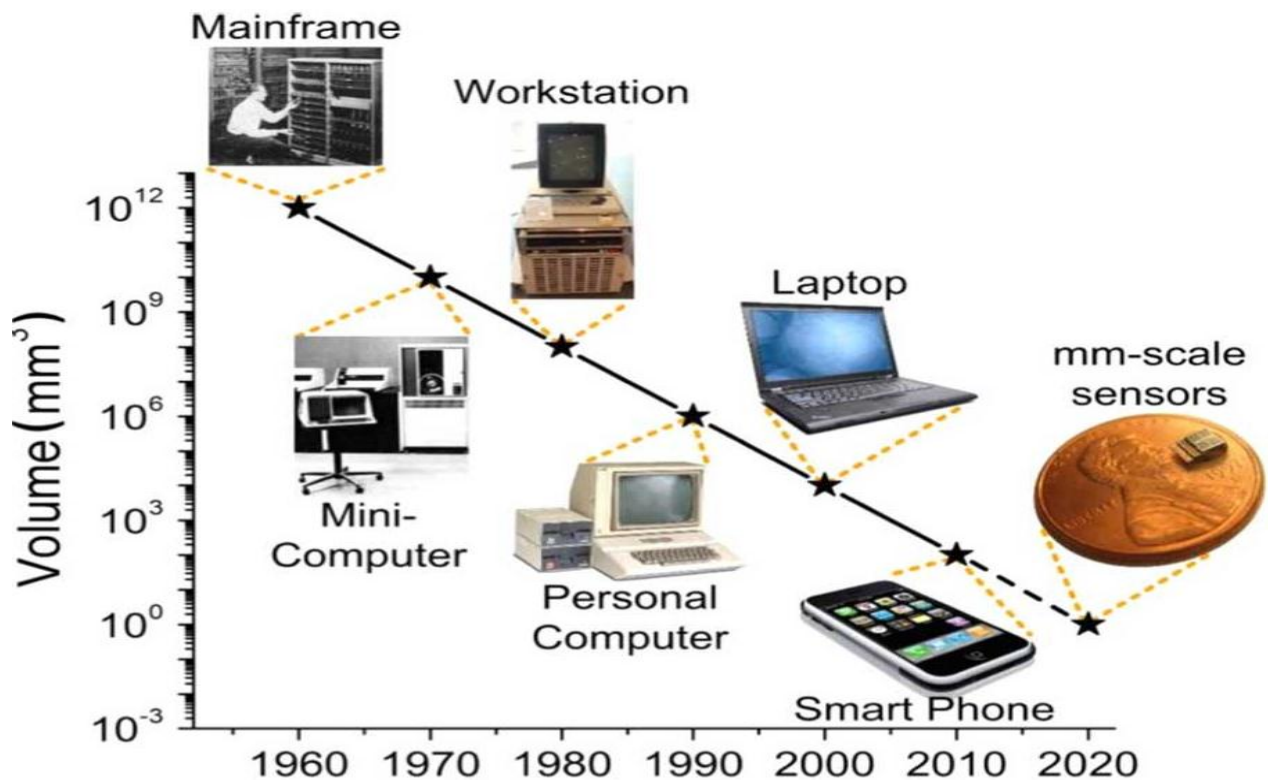
Laptop



Android Smartphone



iPad



## 1. Mainframe Computer

A mainframe computer is a computer system with:

- very powerful processors,
- lots of backing storage,
- large internal memory.

Mainframes are designed to process large volumes of data at high speed. They are used by large businesses such as: banks and mail-order, companies as well as by large, organizations such as universities.

Mainframe computers can also multi-task by running more than one program at the same time. This is known as **multi-programming** and with more memory has become possible on desktop and laptop computers.

## 2. Desktop Computer

A **desktop computer** is the most common kind of PC. It is a collection of a number of different hardware devices. This type of computer is sited permanently on a desk because its design means it cannot be easily moved. The common components of a desktop PC are:

- the system unit containing the processor and main memory
- monitor
- keyboard
- mouse
- hard disk drive
- floppy disk drive
- CD/DVD drive
- speakers.

## 3. Laptop or Notebook Computer





A laptop computer is a small, light computer that you can easily carry about with you. It can be powered by battery or mains power. A laptop computer has a keyboard, and comes with specialised input devices, for example trackballs, touch pads or track points.

They are needed because laptop computers are often operated in places where it is impracticable to use a mouse.

For output the laptop has an LCD or TFT screen and a set of small speakers. 'Laptops' are often as powerful as desktop computers and run the same range and type of software.

People use laptops for working when they are on the move, going to meetings or attending courses.

Many businesses are replacing desktop PCs with special plug-in workstations designed round laptop computers because of the flexibility they offer.

#### **4. Palmtop Computer or Personal Digital Assistant (PDA)**

This type of computer is increasing in popularity, and is often called a **Personal Digital Assistant (PDA)**.

A palmtop computer is small enough to fit in your pocket.

It combines a lot of capabilities, including organiser features (such as storing contact numbers, names and addresses, etc.), e-mail and wireless internet access.



Palmtop's have small keyboards and most let you open menus and select icons by using a special pen or stylus. Most let you enter data by writing with the stylus. They are powered by batteries and store their data on removable memory units called flash cards.

You can run a wide range of software on palmtop's, for example simple word processing, database and spreadsheet software as well as useful applications such as electronic diaries. Many modern palmtop's:

- are converging with mobile phones to let you access the internet
- have wireless communications to let you access your local area network.

**What you have to do!**

**Answer the following questions.**

1. Why do large businesses such as banks use mainframe computers?
2. Describe the components of the desktop computer you use in school or at home.
3. Complete this table comparing a desktop with a laptop.

	Desktop	Laptop
<b>Output</b>	Ordinary Monitor	LCD/TFT
<b>Backing Storage</b>	Hard disk, floppy disk, CD/DVD Drive	
<b>Power Source</b>	Mains Power	
<b>Portable</b>	No	

4. Name three types of software that run on palmtop's.
5. Why are palmtop's useful?

**What you should be able to do!**

1. Describe different types of Computer System..
2. Give some of the advantages and disadvantages of each type of computer System.

3. Recommend a particular computer system for given situations.



**3. Look through the texts and answer:**

- 1) When was the first personal computers appearance?
- 2) What do business use personal computers for?
- 3) How could companies (except Apple) survive IBM's onslaught?
- 4) What are the principal characteristics of personal computers?
- 5) What are the advantages of portable computers?
- 6) What are their drawbacks?
- 7) How many types of portable computers are there?
- 8) What differs personal computer from large computer systems?

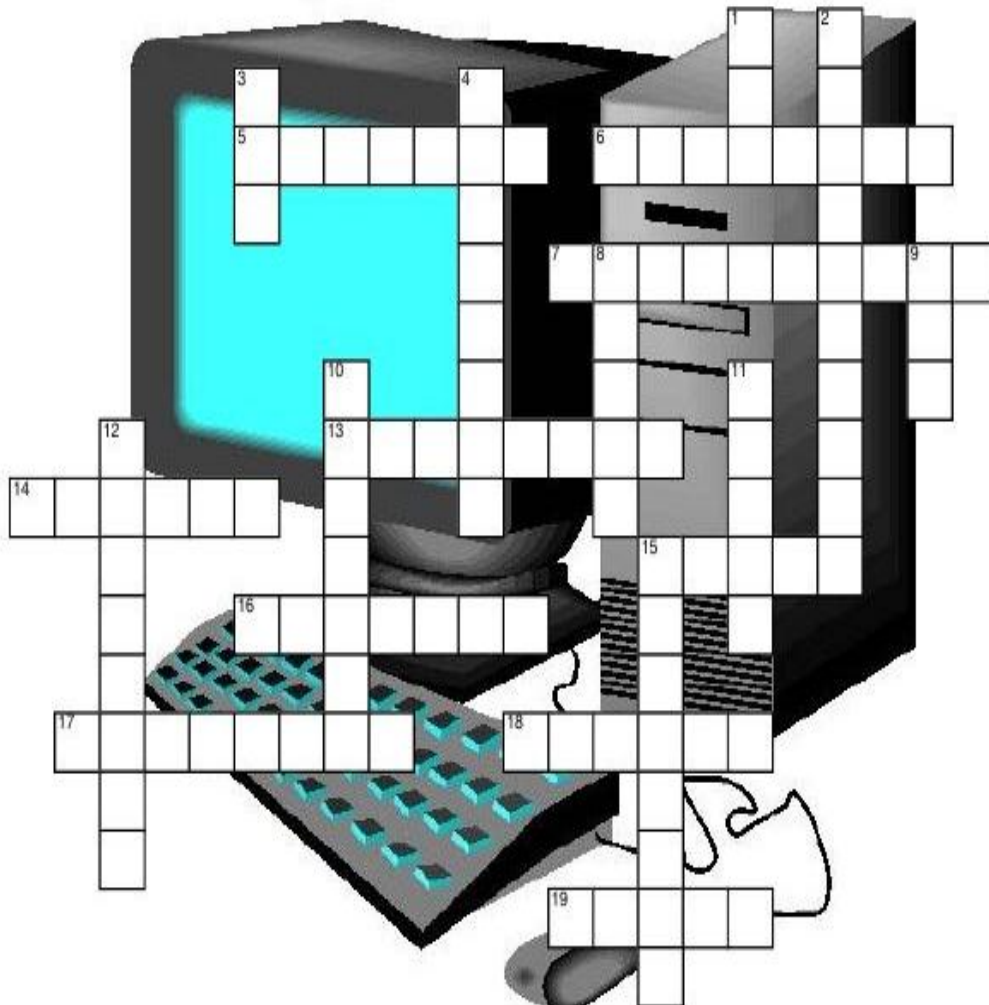
**4. There are some descriptions of computers. Translate them and give in brackets a type of a computer:**

- 1) A typical computer found in many businesses and popular for home use;
- 2) A hand-held computer which can be used as a telephone, a web explorer and a personal organizer;
- 3) A small computer that fits into items of clothing;
- 4) A portable computer that can be closed up like a briefcase; but it can be as powerful as a desktop PC;
- 5) A full-function PC, though it only weighs 1.2 kg –you can go to a meeting and write your notes on it, like a paper notepad; its screen mode can be changed from portrait to landscape;

6) A large computer used for intensive data processing and often linked to many terminals.

**MAKE A CROSSWORD, USING THESE WORDS**

## **Computer Parts Word Puzzle**



KEYBOARD MOUSE SPELLCHECK VIRUS PAINT MOUSEPAD MONITOR CURSOR  
EMAIL GOOGLE CPU HARDWARE SOFTWARE FLASHDRIVE USB CHATTING MP3  
MEGABYTE PRINTER SCANNER

### **3.NON-FINITE VERB FORMS:**

### **GRAMMAR RULES AND EXERCISE:**

**(PARTICIPLE I, PARTICIPLE II, GERUND, INFINITIVE.)**

Категориями числа, лица, залога неличные формы глагола (причастие, инфинитив, герундий,) не обладают и выполнять в предложении функция простого глагольного сказуемого не могут. Выполняя различные синтаксические функции в предложении, так как также обладают качествами, типичными для других частей речи, они все имеют общие глагольные свойства.

### 1) Инфинитив (Infinitive)

Инфинитив–неличная форма глагола, называющая действие, не указывая на числа и на лица. Отвечает на вопрос что делать? что сделать? E.g.: to buy - покупать, to sell – продавать. Инфинитив в предложении употребляется без частицы “to” после ряда модальных глаголов.

**Инфинитив в предложении может быть в различных функция:**

#### 1. Подлежащим:

**To work** much is difficult. **Работать** много – тяжело.

**To travel** is pleasant. **Путешествовать** – приятно.

#### 2. Именной частью сказуемого:

My service was **To deliver** the goods. Моей обязанностью было **Доставить** Товары.

Their duty was **To pass** exams well. Их обязанностью было **Сдавать** экзамены хорошо.

#### 3. Частью составного сказуемого:

We wanted **To sell** the computers. Мы хотели **Продать** компьютеры.

The manager decided **To conduct** talks. Менеджер решил **Провести** переговоры.

#### 4. Дополнением:

I asked him **To finish** the work. Я попросил его **Закончить** работу.



The director told me **To pay** in advance. Директор приказал мне **зАплатить** заранее.

### **5. Обстоятельством:**

Мы разработали новую модель для того, чтобы **Получить** прибыль. - We developed a new model **To get** profit.

Дэвид поехал в офис, чтобы **Поговорить** с директором. - David went to the office **To talk** with the director

### **6. Определением:**

It is the problem **To be solved** at once. Вот проблема, которую нужно немедленно **Решить**.

I was the first **To come**. Я **Пришел** первым.

### **Ex. 1. Define the function of the Infinitive:**

1. Grove offered to promote these products.
2. He came to stay.
3. His responsibility was to maintain business relations.
4. I had a problem to solve.
5. Rand asked the manager to help.
6. The secretary called Stella Loren's to confirm the order.
7. They advertised the goods to impress public.
8. To succeed is difficult.
9. To win is terrific.
10. We want to increase our market share.

### **2) Герундий (Gerund)**

Герундий – это неличная глагольная форма, обладающая как свойствами глагола, так и свойствами существительного. По форме герундий совпадает с Participle I: **Swimming; Selling; Making**.

Герундий может быть представлен в предложении в функции:

#### **1. Подлежащего:**

<b>Studying</b> English is her hobby.	<b>Изучение</b> английского языка – ее хобби.
<b>Making</b> business plans is very important.	<b>Составление</b> бизнес-планов – очень важно.

### 1. Именной части составного сказуемого:

Her favourite occupation is <b>Swimming</b> .	Её любимое занятие – это <b>Плавание</b> .
The objective of their company is <b>Producing</b> excellent goods.	Главной задачей их компании является <b>Производство</b> отличных товаров.

### 2. Части составного глагольного сказуемого:

We started <b>Issuing</b> shares 2 years ago.	Мы начали <b>Выпускать</b> акции 2 года назад.
The Chief accountant continued <b>Making</b> the statement.	Главный бухгалтер продолжил <b>Составлять</b> отчет.

### 3. Определения:

The thermometer is the device for <b>Measuring</b> temperature.	Термометр – это прибор для <b>Измерения</b> температуры.
I had the pleasure of <b>Talking</b> with the President.	Я имел удовольствие <b>Поговорить</b> с Президентом.

### 6. Прямого дополнения:

I like **Negotiating** with Mr. Robin  
 Мне нравится **Вести** переговоры с мистером Робинсом.

We remember **Discussing** this  
 Мы помним, что **Обсуждали** этот

question.

вопрос.

**7. Предложного косвенного дополнения:**

She is good at **Typing**.

Она хорошо **Печатает**.

He is tired of **Going On business** trips.  
Он устал от **Поездок В**  
командировки.

**7. Обстоятельством:**

After **Writing** the Statement the manager talked with the director.  
**Написав** Отчет, менеджер поговорил с директором.

The company has increased profit by **Producing** new type of TV sets.  
Компания увеличила прибыль, **Производя** новые виды телевизоров.

**Ex. Define the function of Gerand:**

1. **Arranging** meetings is Sally's duty.
2. He is afraid of **Running** risks.
3. Linda Lawson is proud of **Running** the company.
4. **Making** plans is necessary in every business.
5. Our director likes **Subscribing** scientific journals.
6. Printer is an instrument for **Typing** papers.
7. Rebecca continued **Discussing** the matter.
8. The main task is **Satisfying** consumers' needs.
9. They are interested in **Registering** the company.
10. We solved the problem by **Writing** the letter.

После предлогов: **After; before; instead of; for; of;** by и т. д., а также глаголов, за которыми следуют предлоги: **Be fond of; be tired of; think of** И других, часто употребляется герундий.

Как и инфинитив, также и герундий, не редко используется в функции дополнения после глагола-сказуемого. Обратите внимание после каких глаголов употребляется герундий, а после каких – инфинитив.

Инфинитив употребляется после следующих глаголов:	Герундий употребляется после следующих глаголов:
Prefer – предпочитать	Be afraid of – бояться
Forget – забывать	Be busy – быть занятым
Propose – предлагать	Be engaged of – быть занятым
Refuse – отказываться(ся)	Be fond of – нравиться
Intend – намереваться	Be good at – хорошо удаваться
Would like – хотел бы	Be interested in – интересоваться
Manage - удаваться	Be proud of – гордиться
Offer – предлагать	Be scared of – бояться
Agree – соглашаться	Be tired of – уставать
Begin* – начинать	Begin* – начинать
Decide – решать	Continue – продолжать
Dislike* – не любить	Dislike* – не любить
Want – хотеть	Enjoy – получать удовольствие
Finish* – заканчивать	Finish* – заканчивать
Hate* – ненавидеть	Hate* – ненавидеть
Like * – любить	Like* – любить
Plan – планировать	Start – начинать
Try – пытаться	Stop – заканчивать
Promise – обещать	Suggest – предлагать
	Think of - думать

Знак \* после глагола означает, что после данного глагола может употребляться и герундий и инфинитив.

E.g.: The manager Likes **meeting** business partners.

The manager Likes **to meet** business partners.

**Ex. 3.** Translate the sentences using the Infinitive and Gerund.:

11. Студенты договорились встретиться вечером.
12. Секретарь забыла сообщить вам эту новость.
13. Роберт интересуется изучением спроса и предложения.
14. Они продолжали обсуждать этот вопрос в течении 2-х часов.
15. Она занята переводом документов.
16. Нам удалось получить скидку на данный вид товаров.
17. Мистер Дэвидсон предложил закупить партию компьютеров.
18. Директор отказался подписывать документы.
19. Джордж обещал позвонить после 6 часов вечера.
20. Вы хотели бы поговорить с Генеральным Директором?

### 3) Причастие (Participle)

Participle – это неличная форма глагола, обладающая свойствами прилагательного, глагола, или наречия. Служит определением к существительному. Это связано с тем, что оно обладает свойствами прилагательного (отвечает на вопрос какой?).

Например: He delivered the goods **Produced** in this country.

Он доставил товары, **Произведенные** в этой стране.

The **Signed** documents are on the shelf.

**Подписанные** Документы находятся на полке.

Причастие в предложении может быть обстоятельством, так как может обладать свойствами наречия,: отвечает на вопрос **Что делая?**

They were talking long **Discussing** future plans.

Они долго разговаривали, **Обсуждая** планы на будущее.

She was preparing for the exam **Typing** Texts on the computer.

Она готовился к экзамену, **Печатаая** тексты на компьютере.

**Ex. 1.** Найдите в тексте и переведите предложения с the Infinitive, Participle I, Participle II, Gerund. Подчеркните эти части речи и в скобках укажите.

**Ех. 2.** Переведите предложения и подчеркните Причастие I and Причастие II.

1. Low-cost modulator-demodulator devices, called modems, allowing microcomputer systems to communicate over telephone lines have become increasingly popular.
2. The start-up process is called bootstrapping.
3. These data appeared to have been investigated long ago.
4. These devices enable inputting numerical and text data.
5. When keyed the data are held in a small memory called buffer.

**Ех. 3.** Переведите предложения, обращая внимание на следующие слова: *that; so that; if, whether; which; when; while; since; till; until; whatever; whenever; in order to; regardless of*

21. High-speed devices are both input and output devices that are used as secondary storage.
22. However, although personal computers are designed as single-user systems, it is common to link them together to form a network.
23. It is difficult to establish whether this problem can be solved at all.
24. It is well known in computer science that the words "computer" and "processor" are used interchangeably.
25. Programs and data on which the control unit and the arithmetic-logical unit operate must be in internal memory in order to be processed.
26. Regardless of the nature of the I/O devices, I/O interfaces are required to convert the input data to the internal codes used by the computer and to convert internal codes to a format which usable by the output devices.
27. Since the computer deals with pulses, the input device is a way of converting numbers written on paper into pulses and sending them to the storage.
28. The CU has a register that temporarily holds the instructions read from memory while it is being executed.

29. The operation part of the instruction is decoded so that the proper arithmetic and logic operation can be performed.
30. The principal characteristics of personal computers are that they are single-user system and are based on microprocessors.
31. The purpose of registers in the ALU is to hold the numbers and the results of the calculation until they can be transferred to the memory.

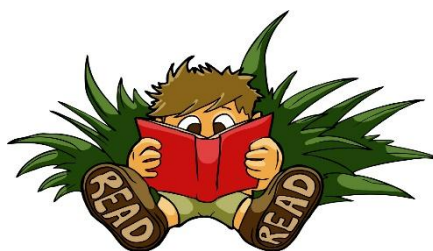
**Ex. 4.** Переведите следующие предложения.

1. All the computer needs is a Java-enabled Web browser to interpret the programming code.
2. Any desktop settings the user enters will be stored under that person's name.
3. Be careful about giving out online anything someone could use to track you down or use your account.
4. *Capacity* refers to the amount of information the disk can hold.
5. Elements integrated circuits are made of are electrically interconnected components.
6. He was one of the greatest scientists the world had ever known.
7. One of the first things most people do with a modem is to connect to one of the big online services.
8. Save any files you have opened on a disk.
9. The computer you told me about was constructed at a Russian plant.
10. The dialog box this icon calls up contains several settings for optimizing your computer.
11. The main tendencies of IC development scientists are working at are to increase the scale of integration and to improve reliability
12. The screen contains the item you need to start working: a *Start* button.
13. The teacher says we may ask any questions we like.
14. The time it takes to download the file depends on the file's size.
15. This is the principle the electronic computer is based upon.

16. We hope we'll buy the computer your friend spoke so much about
17. Where are the computer games I gave you yesterday? - The computer games you are asking about are on the top shelf.
18. Windows has significantly improved the way programs run.

**Ex. 5.** Переведите следующие предложения.

1. Применение компьютера определяется его характеристиками.
2. При редактировании текста вы можете заменять буквы, слова или предложения, менять местами абзацы, добавлять специальные символы или вставлять рисунки и изображения.
3. Подсоедините принтер к компьютеру и проведите инсталляцию.
4. Персональный компьютер есть почти в каждом доме, поэтому большинство студентов знают основы работы с компьютером.
5. Обработываемые данные будут сохранены на двух дисках.
6. На любом компьютере, который продается в этом магазине, установлена операционная система.
7. Купленный компьютер подходит и для работы, и для развлечения.
8. Компьютер, который мы продаем, произведен в Корее.
9. Какие носители информации ты знаешь?
10. Он знает, что у персональных компьютеров могут быть два дисплея:  
ЭЛТ монитор и



жидкокристаллический дисплей.

#### **4.SUPPLEMENTARY READING**



## TEXT 1. DESKTOP COMPUTER VS LAPTOP COMPUTERS

*Exercise 1. Learn the words.*



full-blown —  
 полнофункциональный  
 spreadsheet — электронная  
 таблица  
 touchpad — сенсорная панель  
 zip drive — диск(овод)  
 zip-архив  
 salt-marsh — солончак  
 probe — зонд; датчик

numeric keypad — цифровая клавиатура

ergonomic — эргономичный  
 add-on — добавочный;  
 дополнительный

*Exercise 2. Прочтите и переведите текст:*

. When deciding between purchasing a desktop or a laptop computer, you'll need to consider a handful of criteria and determine what best fits your needs. Below is a chart that compares the two types of computers, providing pros and cons for each to help you make a more informed purchasing decision.

Topic	Desktop	Laptop
<b>Cost</b>	There is a wide variety of component options available for desktops, allowing for a large range of prices, but the starting point is relatively	Laptops can have a fairly wide variety of component options, but they are more limited than desktops. To get a more powerful laptop (higher speed, better graphics, more storage space, etc.), the

	cheap. Desktops can start as low as \$400 for a full package (computer & monitor) and still be a pretty powerful system.	price can be considerably higher, ranging up to \$1500 or more, depending on the brand.
<b>Portability</b>	Desktops are large in size and have a separate monitor. While it's possible to take a desktop from place to place, it's cumbersome and not the choice for portability. They are designed to be used in a single location and not moved around much, if at all.	Laptops are very portable due to their compact size. They were designed to be taken from place to place, carried in a backpack or laptop carrying case. They are great for on-the-go use.
<b>Processor</b>	Desktop processors are a little bit larger in size, but this also means the desktop processors can be more powerful than laptop processors. New, advanced processors on the market are often available in desktop computers first.	Laptop processors have nearly caught up to desktop processors, but are still limited when compared to desktop processors. Gaming laptops can have an equal performance, but have a much higher price.
<b>Internal storage</b>	Desktop computers may have multiple internal drives installed.	Laptop computers usually have room for only one internal drive. If more internal storage is required, the drive must be completely replaced.
<b>External storage</b>	Desktop computers can connect to multiple external drives on its available data ports (USB, Thunderbolt, etc).	Laptop computers can also connect to multiple external drives, although the number of ports on a laptop are fewer than on a desktop computer.
<b>Ease of assembly</b>	Setting up a desktop takes a bit of extra work to hook everything up, start it up, and begin to use. It also requires more space to set up. While it's	Laptops are built to be easy to use, requiring little time to get running. Take it out of the box, plug it in and press the power button. Within minutes, the laptop is ready to use.

	not difficult to connect everything together, it is still more cumbersome than a laptop.	
<b>Keyboard</b>	Desktops can make use of full-size keyboards, including a number pad. There are really no limitations.	Smaller laptops with the 14" and 15" screens have smaller keyboards and don't feature a number pad on the right side. Larger laptops with 17" screens do have larger keyboards and may include a number pad, but the laptops are bulkier and heavier.
<b>Screen size</b>	Desktop monitors can be 19" or larger. It is even possible to hook up a desktop to a TV, so screen sizes could be as large as a TV. This provides for great flexibility on what the desktop is used for and in what environment.	Since portability is a big feature of laptops, smaller screen sizes are necessary and screen sizes often range from 10" to 17". However, a laptop can still connect to an external display and support any size of monitor, screen, or projector.
<b>Power Usage</b>	Desktop computers use more power than a laptop. They have to power a higher wattage power supply, multiple components inside the computer, and a monitor. If the power fluctuates or goes out, including brown outs, any documents being worked on and not saved can be lost.	Laptop computers use less power than a desktop computer. Smaller components means less power is needed to make them work. Laptops also have a battery, so power fluctuations and outages will not cost any unsaved work to be lost. The battery kicks in immediately when power fluctuates or goes out.
<b>Upgrading</b>	Most components in a desktop are easily removable, making it easier to upgrade and since desktop cases are usually much bigger they're easier to work in when doing any upgrading.	Memory and hard drive are about the only components that can be upgraded in a laptop. The remaining components are either built-in and not removable or the laptop is not designed to work with an upgraded version of a component. A

		need to upgrade anything other than the hard drive and memory usually requires a new laptop.
<b>Gaming</b>	Desktops are capable of using high-powered video cards that have higher power requirements and require better heat reduction/dissipation. Virtually any video card could be used in a desktop, including two or more video cards at the same time. Thus, they'll always yield better performance for gaming.	Physical space is limited in a laptop, which limits the graphics capabilities. While higher-end laptops can provide better than average graphics for gaming and CAD-based applications, the heat reduction/dissipation is limited by the space in the laptop case. Power is also limited which doesn't allow for video cards needing those higher amounts of wattage to run.
<b>Repair</b>	Repairing a desktop computer is much easier since most of the hardware can be easily purchased off the shelf of any local computer retail store.	For most users, opening a laptop to repair a part can be difficult and finding a replacement part often requires calling the computer manufacturer or ordering from another online site.

*Exercise 3 Write down unknown words and word-combinations with transcription and translation.*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

## FROM THE HISTORY OF LAPTOP COMPUTERS

*Exercise 1. Learn the words.*

envision — вообразать; представлять

arguably — возможно, надо полагать

die-cast — литой под давлением

LCD panel — жидкокристаллическая панель управления подъемом и

движением

usher in — объявлять

*Exercise 2. Read and translate the text*

e

Year	Event
1975	The first portable computer was the <b>IBM 5100</b> , released in September 1975. It weighed 55-pounds, which was much lighter and more portable than any other computer to date. While not truly a laptop by today's standards, it paved the way for the development of truly portable computers, i.e. laptops.
1976	<u>Alan Kay</u> came up with the idea of the laptop computer in 1976 while working at <u>Xerox PARC</u> , calling it the <b>Dynabook</b> . He helped develop a prototype of his Dynabook, which was officially named the Xerox Note Taker.
1979	<u>Bill Moggridge</u> designed the <b>GRiD Compass</b> in 1979, the most portable computer at the time and the closest example of a laptop computer. NASA used the GRiD Compass in their space shuttle program in the early 1980s.
1981	Developed by <u>Adam Osborne</u> in April 1981, the <b>Osborne I</b> was the first truly portable computer and is recognized as the first true laptop computer. It weighed 24½-pounds and had a 5" display.
1981	<u>Epson</u> released the <b>Epson HX-20</b> in 1981. It was the first portable computer with a built-in printer.
1983	<u>Radio Shack</u> released the <b>TRS-80 Model 100</b> portable computer in the United States in 1983. It featured an <u>LCD</u> , one of the first portable computers with that feature. The <u>TRS-80</u> Model 100 was originally manufactured by <u>Kyocera</u> and sold in Japan, but later the rights were sold to Radio Shack.
1984	<u>Commodore</u> released the <b>Commodore SX-64</b> in 1984, the first portable computer to feature a full-color display screen. It weighed about 20-pounds and sold for \$995.

<b>1986</b>	<u>IBM</u> released their first laptop, the <b>PC Convertible</b> , in 1986. It weighed 12-pounds, making it the first laptop under 15-pounds.
<b>1987</b>	The U.S. Air Force issued an RFP (request for proposal), leading to the purchase of over 200,000 laptops. The contract for the manufacturing and purchase of these laptops was awarded to <u>Zenith Data Systems</u> . The Air Force's purchase of such a large number of laptops helped pave the way for the popularity of laptop computers.
<b>1987</b>	<u>Hewlett-Packard</u> released the <b>Vectra Portable CS</b> laptop in 1987. It was one of the first laptops to feature a 3 ½" <u>floppy disk drive</u> capable of using 1.44 MB diskettes.
<b>1988</b>	<u>Compaq</u> released their first laptop computer in 1988, the <b>Compaq SLT/286</b> . It was the first battery-powered laptop to feature <u>VGA</u> graphics and an internal <u>hard drive</u> .
<b>1989</b>	<u>Apple</u> released their first laptop, the <b>Macintosh Portable</b> , in September 1989. Costing \$6500 at release, it did not sell well and was not a popular laptop.
<b>1989</b>	<u>NEC</u> released the <b>NEC UltraLite</b> in 1989, considered to be the first notebook style laptop, weighing less than 5-pounds.
<b>1991</b>	After the flop of their Macintosh Portable laptop, Apple re-worked their laptop concept and released the <b>PowerBook</b> line of laptops in October 1991.
<b>1992</b>	<u>Microsoft</u> and <u>Intel</u> work together to develop and release APM ( <u>advanced power management</u> ) specification for laptop computers.
<b>1992</b>	<u>Olivetti</u> developed and released the first laptops featuring a <u>touchpad</u> in 1992.
<b>1994</b>	IBM released the <b>ThinkPad 775CD</b> in 1994, the first laptop to feature an integrated <u>CD-ROM</u> drive.
<b>2002</b>	<u>Toshiba</u> released the <b>Toshiba Portege 2000</b> in 2002, the thinnest laptop to be developed at only ¾ of an inch at the thickest part. It also featured the first 1.8-inch <u>hard drive</u> in a laptop.

**2003** Toshiba releases the **Toshiba Portege M100** in 2003, which is the first laptop to feature a slim DVD-ROM drive.

**2007** ASUS released the **Eee PC 701** in October 2007, which was the first netbook to be available. It featured a 7" screen, an Intel Celeron-M processor, and a 4 GB SDHC storage disk.

*Ex. 3. Write down unknown words and word-combinations with transcription and translation*

**Ex. 4. Составьте предложения в разных видо-временных формах со следующими словосочетаниями.**

1. a matter of preference,
2. a variety of uses,
3. answer (handle) needs,
4. common (commonplace),
5. feel right to you,
6. hook up to probes,
7. on the go,
8. seeing that.
9. take up room,
10. use in the field,

**Ex. 5. Divide the expressions of your opinion into three columns: agreement, disagreement, and uncertainty, translate them and use them in dialogues.**

Beyond all doubt.

Goodness knows.

I cannot agree more. I agree with everything you say.

I cannot agree with you.

I don't think so.

I fully agree with you.

I am of the same opinion.

I have some doubt about that.  
I quite agree with you.  
I shouldn't say so.  
I would disagree with what you said. Really?  
Is it a fact?  
Is it true?  
It's an attractive idea, but I don't think everything is quite so simple.  
Just the other way round.  
Not at all.  
Not in the least.  
Oh, no.  
It seems unlikely.  
Oh, yes.  
Quite the opposite! I'm afraid you've missed the point.  
Right you are.  
That's just what I was going to say. That's right.  
I'm afraid you're wrong.  
You are mistaken.  
You are right.

## **CAD WORKSTATION VERSUS PERSONAL COMPUTERS**

### ***Exercise 1. Learn the words.***

circuitry — схема, график, диаграмма

large scale of integration (LSI) — интеграция высокой степени

very large scale of integration (VLSI) — интеграция очень высокой степени

RISC — reduced instruction set computing/computer —

сокращенный набор команд

RISC-processor — процессор с ограниченным набором команд



capacity — емкость памяти

quite a number — значительное количество; целый ряд

contradistinction — противопоставление

highway — магистраль

PCI — peripheral components interconnect — межсоединение периферийных компонентов

entry level — в простейшей комплектации

extendibility — расширяемость кода

aggregate — накопитель, агрегат

go over to — переходить к

come into this category — принять участие в данной категории

contradistinction — противопоставление

sharp price reduction — резкое снижение цен

leave the stage — уйти со сцены

as a result of these changes — как результат изменений

### ***Exercise 2. Read and translate the text***

It can be argued that a **CAD workstation** or a mobile workstation is no different than a standard Pc or personal computer, however while this is indeed true to the uninitiated and at first glance, it is far from the truth when you start to compare off the shelf computer vs workstation computers

The problem here is that unless you are familiar with CAD workstations and the requirements of the software that runs on them, it is very easy to make a costly mistake and buy totally the wrong system.

Comparing a CAD Workstation to a personal Pc is a bit like comparing a sports car with a standard family saloon i.e. they both have a 2.0 litre engine, they both have suspension, they both have 4 wheels and of course 4 tyres and brakes, so it is easy to assume they are the same.

We all understand however that this is not the case! A sports car will be tuned better and configured for performance (so will a CAD workstation), it will

have better and more robust components (the same with a CAD workstation), it will have better cooling and better airflow (common with workstations) and the engine will produce more power. **CAD Workstations - What's The Difference**

Exactly the same analogy applies when comparing a clone pc or gaming pc vs workstation computer, or a generic laptop with a mobile workstation, and without getting too technical here you need to go down to component level and configuration to really understand the difference.

So in order to explore this concept a little further and in greater detail we will now cover some essential differences between a workstation Pc and a standard computer in the CAD workstations - what's the difference section.

***Exercise 3. Write down unknown words and word-combinations with transcription and translation***

***Exercise 4 Put 10 special questions to the text***

***Exercise 5. Discuss with your group-mates main problems of the text.***

***Exercise 6 Make a summary of the text and be ready to tell it***

## **HOW ACCURATELY CAN DIGITAL COMPUTERS**

### **MODEL CHAOS?**

*A new study shows fundamental limitations to the computer-based simulation of chaotic systems with implications in climate change modeling, weather forecasts, and machine learning.*

A recent study by researchers at University College London and Tufts University has found that digital computers cannot reliably reproduce the behavior of ‘chaotic systems’. In their paper published in Advanced Theory and Simulations, the team explains that digital computers use numbers based on

flawed representations of real world numbers, which may lead to inaccuracies when simulating the motion of molecules, weather systems and fluids. This fundamental limitation could have implications for high performance computation (HPC) and for applications of machine learning to HPC.

Professor Peter Coveney, Director of the UCL Centre for Computational Science and the study's co-author, said, "Our work shows that the behavior of the chaotic dynamical systems is richer than any digital computer can capture. Chaos is more commonplace than many people may realize and even for very simple chaotic systems, numbers used by digital computers can lead to errors that are not obvious, but can have a big impact. Ultimately, computers can't simulate everything."

The team investigated the impact of using floating-point arithmetic – a method standardized by the IEEE and used since the 1950s to approximate real numbers on digital computers. Digital computers use only rational numbers, ones that can be expressed as fractions. Moreover, the denominator of these fractions must be a power of two, such as 2, 4, 8, 16, etc. The problem is that there are infinitely more real numbers that cannot be expressed this way.

In the present study, the scientists used all four billion of these single-precision floating-point numbers that range from plus to minus infinity. The fact that the numbers are not distributed uniformly may also contribute to some of the inaccuracies. According to Professor Bruce Boghosian of Tufts University: "The four billion single-precision floating-point numbers that digital computers use are spread unevenly, so there are as many such numbers between 0.125 and 0.25, as there are between 0.25 and 0.5, as there are between 0.5 and 1.0. It is amazing that they are able to simulate real-world chaotic events as well as they do. But even so, we are now aware that this simplification does not accurately represent the complexity of chaotic dynamical systems, and this is a problem for all current and future digital computers."

The study builds on the work of Edward Lorenz of MIT whose weather simulations using a simple computer model in the 1960s showed that tiny

rounding errors in the numbers fed into his computer led to quite different forecasts, which is now known as the “butterfly effect”. The team compared the known mathematical reality of a simple form of a one-parameter chaotic system called the “generalized Bernoulli map” to what digital computers predict when every one of the available single-precision floating-point numbers are used.

They found that, for some values of this parameter, the computer predictions are totally wrong, whilst for other choices, the calculations may appear correct but deviate by up to 15%.

The authors say these pathological results would persist even if double-precision floating-point numbers were used, of which there are vastly more to draw on. “We use the generalized Bernoulli map as a mathematical representation for many other systems that change chaotically over time, such as those seen across physics, biology, and chemistry,” explained Professor Coveney. “These are being used to predict important scenarios in climate change, in chemical reactions and in nuclear reactors, for example, so it’s imperative that computer-based simulations are now carefully scrutinized.”

The team says that their discovery has implications for the field of artificial intelligence, when machine learning is applied to data derived from computer simulations of chaotic dynamical systems, and for those trying to model all kinds of natural processes.

More research is needed to examine the extent to which the use of floating-point arithmetic is causing problems in everyday computational science and modelling and, if errors are found, how to correct them.

***Exercise 1. Read and translate the text***

***Exercise 2. Write down unknown words and word-combinations with transcription and translation.***

***Exercise 3 Put 10 special questions to the text***

***Exercise 4. Discuss with your group-mates main problems of the text.***

***Exercise 5. Make a summary of the text and be ready to tell it***

## **A MICROCOMPUTER**

A microcomputer is a complete computer on a small scale, designed for use by one person at a time. An antiquated term, a microcomputer is now primarily called a personal computer (PC), or a device based on a single-chip microprocessor. Common microcomputers include laptops and desktops. Beyond standard PCs, microcomputers also include some calculators, mobile phones, notebooks, workstations and embedded systems.

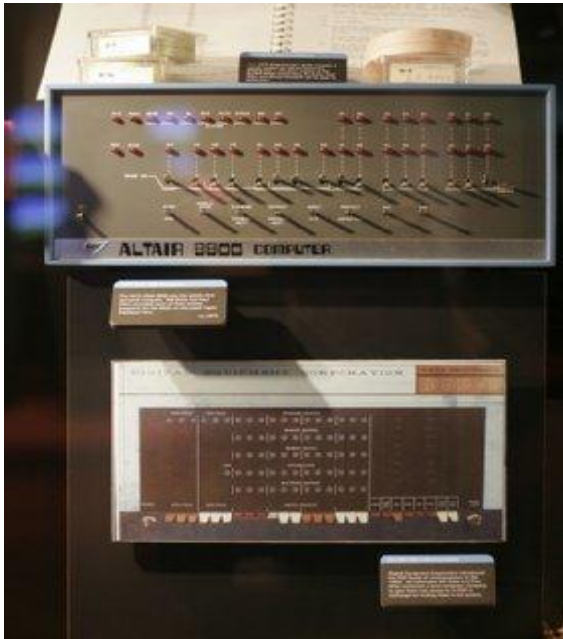
Smaller than a mainframe or minicomputer, a microcomputer uses a single integrated semiconductor chip for its central processing unit (CPU). They also contain memory in the form of read-only memory (ROM) and random access memory (RAM), input/output (I/O) ports, and a bus or system of interconnecting wires, all housed in a single unit usually referred to as a motherboard. Common I/O devices include keyboards, monitors, printers and external storage.

## **HISTORY OF MICROCOMPUTERS**

The term microcomputer dates back to the 1970s. The advent of the Intel 4004 microprocessor in 1971, and later the Intel 8008 and Intel 8080 microprocessor in 1972 and 1974 respectively, paved the path to the creation of the microcomputer.

The first microcomputer was the Micral, released in 1973 by Réalisation d'Études Électroniques (R2E). Based on the Intel 8008, it was the first non-kit computer based on a microprocessor. In 1974, the Intel 8008-based MCM/70 microcomputer was released by Micro Computer Machines Inc. (later known as MCM Computers).

Though released after the Micral and MCM/70, the Altair 8800 is often considered the first successful commercial microcomputer. Released in 1974, it was designed by Micro Instrumentation Telemetry Systems (MITS) and was based on the Intel 8080 microprocessor. It retailed for around \$400 in kit form, \$600 assembled (\$2,045 and \$3,067 in 2018 dollars, respectively).



As microprocessor chip design matured, so did the processing capacity of microcomputers. By the 1980s, microcomputers were being used for more than games and computer-based recreation, finding widespread use in personal computing, workstations and academia. By the 1990s, microcomputers were being produced as pocket-sized personal digital assistants (PDAs), and later came in the form of cellphones and

portable music players. (RON WURZER/GETTY IMAGES - An Altair 8800 lies on display at the Microsoft Visitor Center April 6, 2005 in Redmond, Wash.)

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation.*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

## **MICROCOMPUTERS VS. MICROPROCESSORS**

A microprocessor is a computer processor on a microchip that contains all or most CPU functions. Microprocessors do not have RAM, ROM or other peripherals. As such, microprocessors cannot perform standalone tasks. Rather, systems such as microcomputers, which contain microprocessors, can be programmed to perform functions on data by writing specific instructions for their microprocessors into their memory.

A microcomputer can technically be described as the combination of a microprocessor and its peripheral I/O devices, circuitry and memory -- just not on a single chip.

### **Microcomputers vs. minicomputers**

While microcomputers generally refer to laptops or desktops, minicomputers were a variety of computer primarily used in the 1960s to 1980s. Minicomputers were larger than microcomputers -- some stood more than 6 feet tall and weighted up to 700 pounds -- and boasted higher processing speeds at a significantly smaller size and price than mainframes and supercomputers available at the time. While microcomputers were often used at home and in the office, minicomputers were primarily found in academia, research labs and small companies, and they were used for word processing, accounting and teaching aids.

Digital Equipment Corporation's Programmed Data Processor-1, or PDP-1, was announced in 1960 and sold for \$120,000 (\$1,021,776 in 2018 dollars). Its descendent, the PDP-8, was introduced in 1965 and sold for nearly \$18,500 (\$148,022 in 2018 dollars). Considered one of the most successful minicomputers and first example of a commercial minicomputer, the 12-bit PDP-8 has been compared to the size of a small household refrigerator.

Minicomputers did not contain microprocessors. In the 1980s, the minicomputer's prevalence declined as microprocessors became more powerful and available at lower cost.

An antiquated term, minicomputers are often referred to as midrange computers.

### **Microcomputers vs. mainframes**

A mainframe computer is a high-performance computer used for large-scale computing purposes that require greater availability and security than small-scale machines can provide. Mainframes can process requests from a number of users simultaneously, whereas a microcomputer is designed to be used by one person at a time. As such, a mainframe computer can be described as a system that interconnects a number of microcomputers.

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation.*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

## **UNIT V PERSONAL COMPUTERS APPLICATION**

## **ПРИМЕНЕНИЕ ПЕРСОНАЛЬНЫХ КОМПЬЮТЕРОВ**





**Exercise 1.** Read new words and word combinations and memorize them.

accountant–бухгалтер

accounting–бухгалтерский учет

appliance – устройство; прибор

application software – прикладные программы

computer-assisted instructions–компьютерные программы

grading – оценивание; классификация

income tax–подходный налог

maintenance – поддержание; сохранение; эксплуатация

record keeping–регистрация; ведение записей

scheduling – составление расписания, графика

stock market forecasting – биржевые прогнозы

telephone dialing – набор номера телефона

to delete – удалять; стирать; очищать память

to meet the demands–удовлетворять потребности

to move paragraphs around – менять местами абзацы

word processing – обработка текста

worksheet – электронная таблица

## 1. AREAS OF PERSONAL COMPUTERS APPLYING

*Exercise 2. READ AND TRANSLATE THE TEXT*

### Text 1 AREAS OF PERSONAL COMPUTERS APPLYING



Common uses of computer which are as follow:

- Data Storage
- Education
- Communication
- Defense Purpose
- Office Work
- Science and Technology
- Training Purpose
- Transportation
- E-Learning
- Medical Science



Despite the fact PC has a lot of applications, there are some major categories of applications: word processing, professional, home and hobby, educational, small business and engineering and scientific.

**Word processing.** At home or at work, applications software, which is called a word processing program, enables you to correct mistakes in spelling or grammar or modify any document in any manner you wish before printing it.

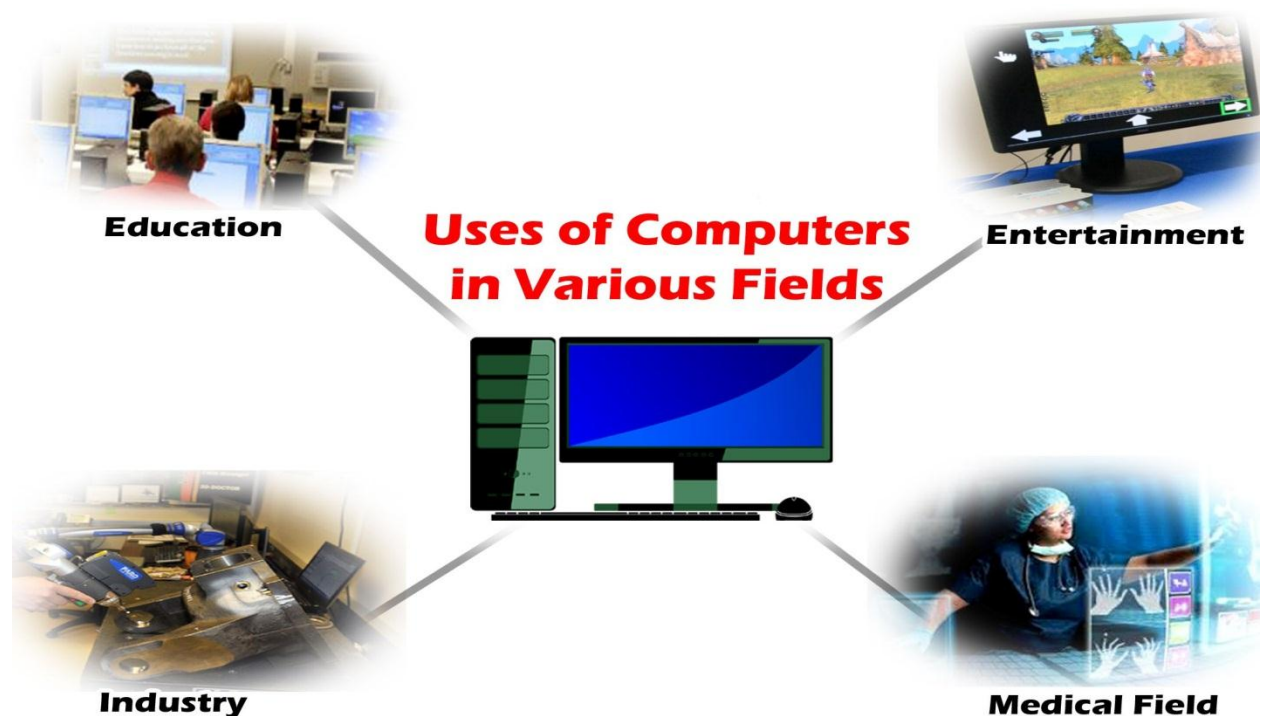
**Home and hobby.** PC enjoys great popularity among experimenters and hobbyists. All hobbyists need not to be engineers or programmers. There are many games that use the full capabilities of a computer to provide many hours of exciting leisure-time adventure. The list of other home and hobby applications of PCs is almost endless, including: personal finance, planning, investment analyses, telephone answering and dialing, home security, home environment and climate control, appliance control, calendar management, maintenance of address and mailing lists and what not.

**Educational.** PCs are having and will continue to have a profound influence upon the classroom, affecting both the learner and the teacher.

Microcomputers are making their way into classrooms to an ever-increasing extent, giving impetus to the design of programmed learning materials that can meet the demands of student and teacher.

Two important types of uses for personal computers in education are computer-managed instruction (CMI), and computer-assisted instruction (CAI). CMI software is used to assist the instructor in the management of all classroom-related activities, such as record keeping, work assignments, testing, and grading. Applications of CAI include mathematics, reading, typing, computer literacy, programming languages, and simulations of real-world situations.

**Professional.** The category of professional includes persons making extensive use of word processing, whose occupations are particularly suited to the desk-top use of PCs. Examples of other occupations are lawyers, architects, engineers, educators and all levels of managers. Applications programs that are popular with persons in these occupations include statistical analysis, graphics and computer modeling. The electronic worksheet is, by far, the computer modeling program most widely used by professionals. It can be used for scheduling, planning, and the examination of "what if" situations.



**Exercise 3.** *Ответьте на вопросы по тексту:*

1. Is it possible to correct mistakes while typing any material and how?
2. What is the usage of computers in education?
3. Representatives of what professions except an analyst or a programmer can use a computer?
4. What are the main fields of PC application?
5. What is “a word processing program”?
6. What other changes in the typed text can you make using a display?
7. What other home and hobby applications, except computer games, can you name?
8. What possibilities can it give us?
9. Which professions are in great need of PC?

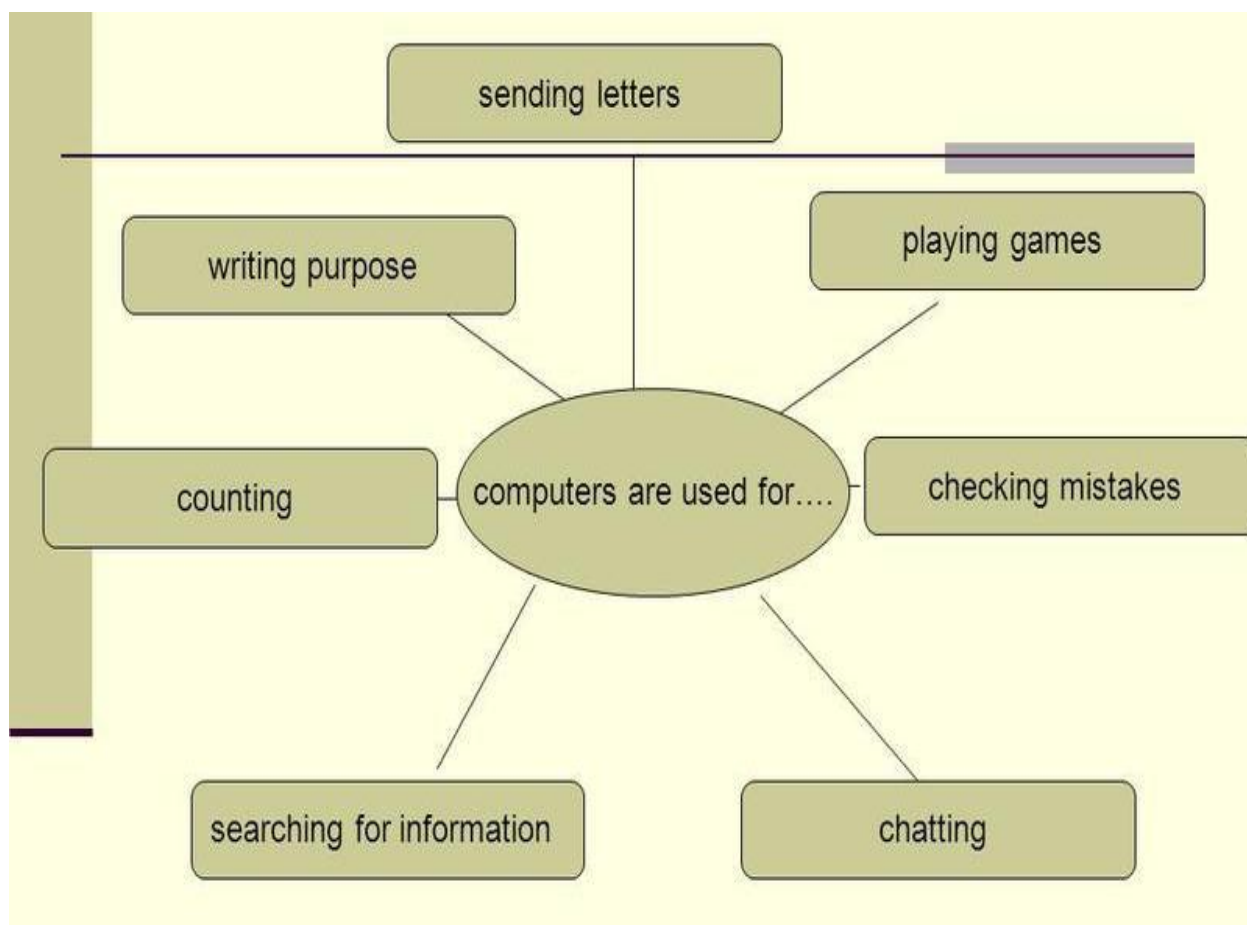
**Exercise 4.** *Find out the English equivalents for the following word combinations:*

Бесконечный перечень; ведение календаря; анализ инвестиций; способности компьютера; набор номера телефона; подходящий налог; бухгалтерский учет; компьютерное моделирование; автоответчик; моделирование реально-жизненных ситуаций; электронные таблицы; прокладывать путь; хранение адресов и почты; консультант по налогам; переставлять абзацы; составление расписания; оказывать огромное влияние; и так далее; биржевые брокеры; исправлять ошибки в написании; стирать предложения; работники образования; много областей применения; бесконечный перечень; способности компьютера; дать толчок; учебная деятельность; биржевые брокеры; тем не менее, анализ инвестиций; прикладные программы.

**Exercise 5.** *Translate the groups of words:*

Give an impetus; to have a profound influence; tax consultants; to meet the demands; mistakes in spelling; to move paragraphs around; word processing; to affect both the learner and the teacher; computer-managed instruction; computer assisted instruction.

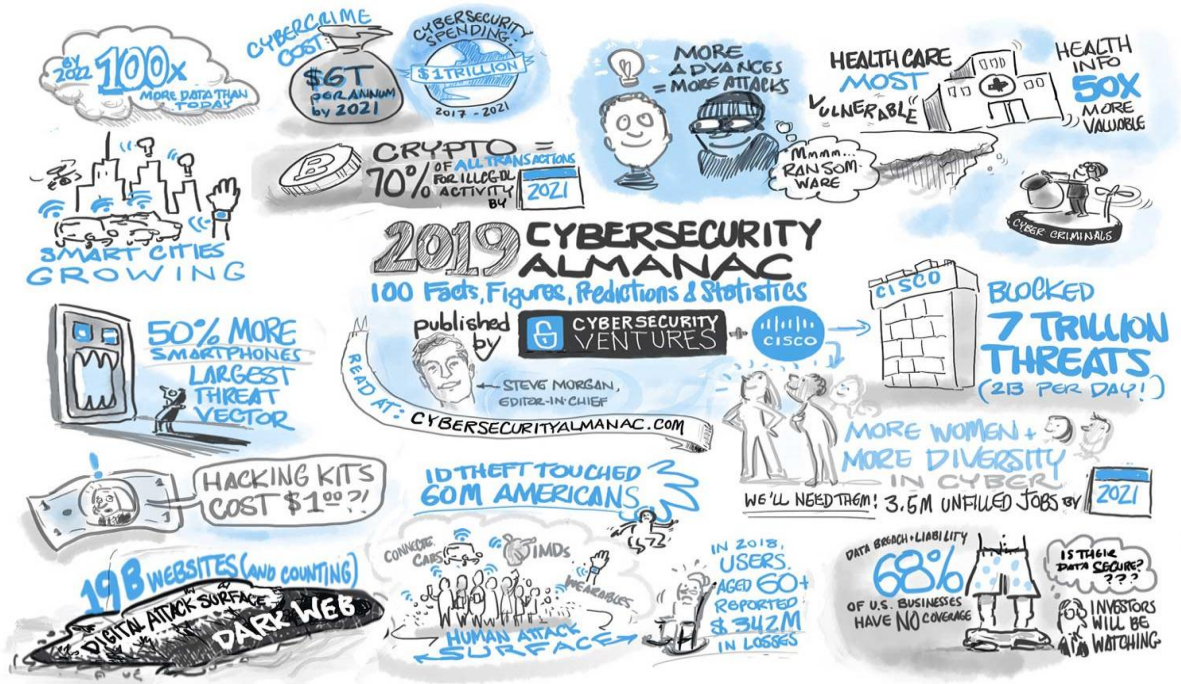
**Exercise 6.** Make up your own dialogues.



Your groupmate tries to prepare for his/her exam, he/she asks you for help. Be ready to discuss with him/her everything you know about PC, especially its application.

**Exercise 7.** Speak about PC application.

## 2.BASIC COMPUTER SECURITY



READ AND TRANSLATE THE TEXT 2

### BASIC COMPUTER SECURITY: HOW TO PROTECT YOURSELF FROM VIRUSES, HACKERS, AND THIEVES

All the software we use every day is likely riddled with security issues. These security issues are constantly being found—whether we're talking about Windows, Internet Explorer, Mozilla Firefox, Google Chrome, the Adobe Flash plugin, Adobe's PDF Reader, Microsoft Office—the list goes on and on.

These days, a lot of operating systems and programs come with automatic updates to close these security holes. No longer do you need to click a button or download a file to update your software; it'll update itself in the background without any input from you.

Some people like to turn this off for one reason or another. Maybe you don't like that Windows restarts after installing an update, or maybe you just don't like change. But from a security perspective, you should always leave automatic updates on.

Keeping your computer up-to-date is the number one way to keep it safe against online threats. Microsoft provides updates for Windows and associated Microsoft products (Defender, Office) on the second Tuesday of each month. Apple doesn't have a regimented schedule, but they also regularly provide updates. These updates not only fix bugs, but they patch security holes. So the only way to protect yourself against the latest known vulnerabilities is by updating. Malicious attackers are always looking for unpatched systems they can attack, and automatic updates keeps you off the list of low hanging fruit.

You should also have a password on your computer and a passcode on your phone, too. I know, I know, it's inconvenient. But while it may take a few seconds longer than just hitting one button, it's an easy and important way to keep your information secure. Having a password on your computer and phone will stop random people from just picking up and using your device.

You hear it all the time: don't open emails from people you don't know, and don't click on links in emails you don't trust. But that isn't enough. A lot of times, malicious links can come from friends who have been infected, or from emails that *look* legitimate, but are actually fake. This is known as *phishing*.

If you want to be truly secure, you could never click on links in emails. But that's not realistic or convenient, although we do recommend against clicking email links to sensitive locations like your bank's website. Just head to your bank's website normally. For other links in emails, the middle ground option is knowing how to investigate a link before you click on it—yes, even ones from your friends.

**Exercise 1** *Write down unknown words and word-combinations with transcription and translation*

**Exercise 2.** *Discuss with your group-mates the different types of computer security.*

**Exercise 3.** *Put five types of questions to the text.*

### 3.INFINITIVE CONSTRUCTIONS

#### GRAMMAR RULES AND EXERCISE:

#### ABSOLUTE INFINITIVE CONSTRUCTION

**Absolute Infinitive Construction** – это оборот, который состоит из существительного **в общем падеже** и **инфинитива**. Существительное в этом случае обозначает лицо или предмет, который совершает действие, выраженное инфинитивом, или на которое направлено действие. Место этого оборота - в конце предложения. Он отделен запятой и переводится предложением с союзом "**причем**", Глагол выражает *долженствование*.

The sellers offered the buyers 5,000 tons of oil, **delivery to be made** in October.  
*Продавцы предложили покупателям 5000 тонн нефти, причем поставка должна была быть произведена в октябре.*

The buyers requested the sellers to keep them informed of the position of the vessel, **the communications to be addressed** to their agents.  
*Покупатели просили продавцов держать их в курсе местонахождения судна, причем сообщения должны были направляться их агентам.*

#### COMPLEX OBJECT

Конструкция **COMPLEX OBJECT** выражена сочетанием существительного **в общем падеже** или **личного местоимения в объектном падеже** с **инфинитивом**. Эта конструкция имеет разные названия



(объектный инфинитивный оборот, **Complex Object**, The Objective Infinitive Construction, The Objective-with-the-Infinitive Construction) и имеет следующую схему:

<b>ПОДЛЕЖАЩЕЕ</b>	<b>СКАЗУЕМОЕ</b> (в действительном залоге)	<u>Существительное</u> в <b>общем падеже</b> или <b>личное местоимение</b> в <b>объектном падеже</b> + <u>инфинитив</u>
<b>We</b> <b>Мы</b>	<b>expect</b> <i>надеемся,</i>	<b>him to do</b> it in time. <i>что он сделает это вовремя.</i>

Придаточное предложение почти всегда используется при переводе конструкции на русский язык,.

<b><u>СЛУЧАИ УПОТРЕБЛЕНИЯ КОНСТРУКЦИИ «СЛОЖНОЕ ДОПОЛНЕНИЕ»</u></b>		
<b>№</b>	<b>СЛУЧАЙ УПОТРЕБЛЕНИЯ</b>	<b>ПРИМЕР</b>
<b>1</b>	После <u>глаголов</u> <b>чувственного восприятия</b> : <b>to hear</b> <i>слышать</i> , <b>to see</b> <i>видеть</i> , <b>to watch</b> <i>наблюдать, смотреть</i> , <b>to feel</b> <i>чувствовать</i> , <b>to observe</b> <i>наблюдать</i> , <b>to notice</b> <i>замечать</i> и др. <b>в</b>	<b>I watched her approach.</b> <i>Я смотрел, как она приближается.</i>

	<p>действительном залоге. После этих <u>глаголов</u> инфинитив употребляется <u>без</u> частицы <b>to</b></p>	
	<p>После <u>глаголов</u> <b>чувственного восприятия</b> используется только <b>Indefinite Infinitive Active</b>. Чтобы выразить действие в страдательном залоге, можно использовать <b>причастие II</b></p>	<p>I <u>saw</u> the fire slowly <b>conquered</b>. Я <u>видел</u>, как <b>пожар постепенно потушили</b>.</p>
2	<p>После <u>глаголов</u>, обозначающих умственную деятельность: <b>to know</b> <i>знать</i>, <b>to think</b> <i>думать</i>, <b>to consider</b>, <b>to believe</b>, <b>to suppose</b> <i>думать, полагать</i>, <b>to expect</b> <i>ожидать</i>, <b>to imagine</b> <i>представлять</i>, <b>to find</b> <i>находить, узнавать</i>, <b>to trust</b> <i>верить</i>, <b>to assume</b> <i>допускать, предполагать</i> и др. в действительном залоге. После этих <u>глаголов</u> в составе конструкции очень часто используется глагол <b>to be</b></p>	<p>He <u>considers</u> this <b>question to be</b> of great importance. <i>Он <u>считает</u> этот вопрос очень важным (= что этот вопрос является очень важным).</i></p>
3	<p>После <u>глаголов</u> со значением <b>заявления</b>: <b>to pronounce</b> <i>произносить, говорить</i>, <b>to declare</b> <i>заявлять</i>, <b>to report</b> <i>докладывать</i></p>	<p>The surgeon <u>pronounced</u> the <b>wound to be</b> a slight one. <i>Врач <u>сказал</u>,</i></p>

		что <b>рана</b> лёгкая (= <b>рана</b> является лёгкой).
4	После <u>глаголов</u> , обозначающих <b>чувства и эмоции</b> : <b>to like</b> нравится, <b>to dislike</b> не нравится, <b>to love</b> любить, <b>to hate, cannot bear</b> не мочь терпеть, ненавидеть и т. д.	I <u>hate</u> <b>you to talk</b> in this way. Я <u>терпеть не могу</u> , когда <b>вы так говорите</b> (= <b>вы говорите</b> таким образом).
5	После <u>глаголов</u> , обозначающих <b>приказ или разрешение, принуждение</b> : <b>to order</b> приказывать, <b>to allow, to permit</b> позволять, <b>to suffer</b> неохотно позволять, <b>to have</b> распоряжаться, <b>to make, to have, to get, to force, to cause</b> распоряжаться, приказывать, заставлять и др. в действительном залоге	She <u>suffered</u> <b>Mr. Smith to go</b> her back into her room. Она <u>неохотно позволила</u> , чтобы <b>мистер Смит</b> проводил ее в комнату. She <u>caused</u> <b>a telegram to be sent</b> to him. Она <u>распорядилась</u> , чтобы <b>ему послали телеграмму</b> (= чтобы <b>телеграмма была отправлена</b> ему).

### КОНСТРУКЦИЯ «СЛОЖНОЕ ПОДЛЕЖАЩЕЕ»

Конструкция СЛОЖНОЕ (Complex Subject, субъектный инфинитивный оборот, The Subjective Infinitive Construction, The Nominative-with-the-Infinitive Construction) представляет собой сочетание существительного **в общем падеже** или **личногместоимения в**

именительном падеже, выполняющего в предложении функцию подлежащего, с инфинитивом.

<p><b>ПОДЛЕЖАЩЕЕ</b> (существительное <b>в</b> <b>общем</b> <b>или</b> местоимение <b>в</b> <b>именительном</b> <b>падеже</b>)</p>	<p><b>СКАЗУЕМОЕ</b> (обычно глагол <b>в страдательном залоге</b>)</p>	<p><b>ИНФИНИТИВ</b></p>
<p><b>She</b> <b>Она,</b></p>	<p><b>is known</b> <i>как известно,</i></p>	<p><b>to go to work to Paris.</b> <i>поедет работать в Париж.</i></p>

Особенность этой конструкции в том, что именная часть конструкции не выступает как единый член предложения: является в то же время подлежащим предложения, а инфинитив представлен частью составного глагольного сказуемого.

<p align="center"><b><u>ПРИМЕРЫ УПОТРЕБЛЕНИЯ КОНСТРУКЦИИ</u></b> <b><u>«СЛОЖНОЕ ПОДЛЕЖАЩЕЕ»</u></b></p>		
<p><b>№</b> <b>п/</b> <b>п</b></p>	<p><b>СЛУЧАЙ УПОТРЕБЛЕНИЯ</b></p>	<p><b>ПРИМЕР</b></p>
<p><b>1</b></p>	<p>С <u>глаголами</u> <b>чувственного восприятия:</b> <b>to hear слышать,</b></p>	<p><b>Bob was heard to laugh</b> heartily. <i>Было слышно, как Боб смеялся от всего сердца.</i></p>

	<p><b>to see</b> <i>видеть</i>,</p> <p><b>to watch</b> <i>наблюдать, смотреть</i>,</p> <p><b>to feel</b> <i>чувствовать</i>,</p> <p><b>to observe</b> <i>наблюдать</i>,</p> <p><b>to notice</b> <i>замечать</i> и др. в страдательном залоге. В данной конструкции, после ЭТИХ <u>ГЛАГОЛОВ</u> инфинитив употребляется с частицей <b>to</b></p>	
2	<p>С <u>глаголами</u>, обозначающими умственную деятельность:</p> <p><b>to know</b> <i>знать</i>, <b>to think</b> <i>думать</i>, <b>to consider</b>, <b>to believe</b>, <b>to suppose</b> <i>думать, полагать</i>, <b>to expect</b> <i>ожидать</i>, <b>to imagine</b> <i>представлять</i>, <b>to find</b> <i>находить, узнавать</i>, <b>to trust</b> <i>верить</i>, <b>to assume</b> <i>допускать, предполагать</i> и др.</p> <p>в страдательном залоге. После ЭТИХ <u>ГЛАГОЛОВ</u> в составе конструкции часто используется глагол <b>to be</b></p>	<p><b>Philip was known to be</b> a young man without money.</p> <p><i>Знали, что Филипп был молодым человеком без денег.</i></p>
3	<p>С глаголом <b>to make</b> <i>заставлять</i> (в страдательном залоге).</p>	<p>Little <b>Bob was made to put on</b> some warm clothes.</p> <p><i>Маленького Боба заставили надеть теплую одежду.</i></p>

4	<p>С глаголами в значении <b>сообщения</b>:</p> <p><b>to say</b> <i>говорить</i>,</p> <p><b>to report</b> <i>сообщать</i>,</p> <p><b>to state</b> <i>утверждать</i></p> <p>в <b>страдательном</b> залоге.</p>	<p>В <b>He is <u>said</u> to have gone</b> to work to Siberia.</p> <p><i>Говорят, что он уехал работать в Сибирь.</i></p>
5	<p>В <b>действительном</b> залоге глаголами:</p> <p><b>to seem</b> <i>казаться (по-видимому)</i>,</p> <p><b>to happen</b> <i>случаться (случается, случилось)</i>,</p> <p><b>to prove</b> <i>доказывать (оказывается, оказалось)</i>,</p> <p><b>to be likely</b> <i>вероятно</i>,</p> <p><b>to be unlikely</b> <i>вряд ли</i>,</p> <p><b>to be sure, to be certain</b> <i>быть уверенным (наверняка)</i>,</p> <p><b>to turn out</b> <i>оказываться (оказалось) и т. п.</i></p>	<p>с <b>They are <u>unlikely</u> to come</b> in time.</p> <p><i>Они <u>вряд ли</u> придут вовремя.</i></p> <p><b>The work <u>proved</u> to be</b> useful.</p> <p><i>Работа <u>оказалась</u> полезной (= Работа, <u>как</u> <u>оказалось</u>, <i>была</i> полезной).</i></p> <p><b>They <u>seemed</u> to have forgotten</b> him.</p> <p><i>Они, <u>казалось</u>, забыли его.</i></p>

### КОНСТРУКЦИЯ «FOR-TO-INFINITIVE»

Данная конструкция (инфинитивный оборот с предлогом for, **FOR-TO-INFINITIVE Construction**, оборот for + существительное или местоимение + инфинитив) представляет собой сочетание существительного в общем падеже или личного местоимения в объектном падеже с инфинитивом при помощи предлога **for**:

	<b>FOR</b>	<b>СУЩЕСТВИТЕЛЬНОЕ</b> (в общем падеже) или <b>ЛИЧНОЕ</b> <b>МЕСТОИМЕНИЕ</b> (в объектном падеже)	<b>ИНФИНИТИВ</b>
Here is the text	<b>for</b>	<b>her</b>	<b>to translate.</b>

*Вот текст, который ей надо перевести.*

При переводе местоимение или существительное или такой конструкции становится подлежащим, а инфинитив - сказуемым. Как в действительном, так и в страдательном залоге при этом может употребляться Инфинитив. Конструкцию можно переводить: 1) существительным, 2) инфинитивом, 3) придаточным предложением.

## The-for-to-infinitive-construction Next

Subject	<b>to be</b> easy <b>for</b> smb <b>to do</b> smth	• <b>It is difficult</b> for me <b>to understand</b> her reasons.
Object	1) <b>to wait, to arrange, to be anxious + for</b> smb <b>to do</b> smth 2) <b>To make, to think + it is easy/difficult</b> for smb <b>to do</b> smth	• <b>I'm not waiting</b> for you <b>to come</b> • His words <b>make</b> it difficult for me <b>to forgive</b> you
Attribute	1) <b>there is somebody, there is nothing + for</b> smb <b>to do</b> b) <b>It's not the right thing/the only thing + for</b> smb <b>to do</b>	• <b>Is there anyone</b> for her <b>to take</b> care of • <b>It's the only thing</b> for me <b>to eat</b>
The Adverbial Modifier of	<b>Purpose</b> to do smth for smb to do smth	• <b>I bought</b> a toy for him <b>to play</b> .
	<b>Result</b> (too) clever(enough), young for smb to do smth	• <b>The water was</b> cold for child <b>to swim</b>

## GRAMMAR EXERCISES

*Exercise 1. Complete these sentences using Complex Object.*

• **E.g.** "Bring me a book," said my brother to me. My brother **wanted me to bring** him a book.

1. "Be careful, or else you will spill the milk," said my mother to me. — My mother did not want ...
2. "Bring me some water from the river, children," said our grandmother. — Our grandmother wanted ...
3. "Come to my birthday party," said Kate to her classmates. — Kate wanted ...
4. "Don't eat ice cream before dinner," said our mother to us. Our mother did not want.
5. "Fix the shelf in my kitchen," my father said to me. — My father wanted ...
6. "It will be very good if you study English," said my mother to me. — My mother wanted ...
7. "My daughter will go to a ballet school," said the woman. — The woman wanted ...
8. "Oh, father, buy me this toy, please," said the little boy. — The little boy wanted ...
9. "Wait for me after school," said Ann to me. — Ann wanted ...
10. The biology teacher said to us: "Collect some insects in summer." — The biology teacher wanted ...
11. The man said: "My son will study mathematics." — The man wanted ...
12. The teacher said to the pupils: "Learn the rule." — The teacher wanted ...

*Exercise 2. Translate these sentences using Complex Object.*

1. Вам бы хотелось, чтобы я рассказал вам эту историю?



2. Дети хотели, чтобы я рассказал им сказку.
3. Им бы хотелось, чтобы мы проиграли игру.
4. Мне бы не хотелось, чтобы они опоздали.
5. Мне бы хотелось, чтобы вы приехали к нам.
6. Мне хотелось бы, чтобы доктор посмотрел его.
7. Мой брат хочет, чтобы я изучала испанский язык.
8. Мы хотим, чтобы этот артист приехал к нам в школу.
9. Он хотел, чтобы его друг пошел с ним.
10. Она бы хотела, чтобы ее брат получил первый приз.
11. Она не хотела, чтобы я уехал в Москву.
12. Она хотела, чтобы ее сын хорошо окончил школу.
13. Папа хочет, чтобы я была пианисткой.
14. Хотите, я дам вам мой словарь?
15. Я бы не хотел, чтобы вы потеряли мою книгу.
16. Я бы хотел, чтобы мои ученики хорошо знали английский язык.
17. Я не хотела, чтобы вы меня ждали.
18. Я не хочу, чтобы она знала об этом.
19. Я не хочу, чтобы ты получил плохую оценку.
20. Я хочу, чтобы все дети смеялись.
21. Я хочу, чтобы все это прочитали.
22. Я хочу, чтобы вы прочли эту книгу.

*Exercise 3. Перепишите следующие предложения, употребляя сложное дополнение вместо придаточных дополнительных предложений.*

• **E.g.** I expect **that she will send** me a letter. I expect **her to send** me a letter. I know **that he is** a great scientist. I know **him to be** a great scientist.

1. She expected that her brother would bring her the book.
2. People expect that the 21st century will bring peace on the Earth.
3. I know that your uncle is an excellent mathematician.
4. I know that my friend is a just man.

5. I expected that she would behave quite differently.
6. I expect that he will understand your problem and help you to solve it.
7. I did not expect that my brother would forget to send her flowers.
8. He knows that my mother is a very kind woman.

<i>Complex Subject. Сложное подлежащее</i>	
He <b>was said to</b> work a lot.	— <b>Говорили</b> , что он много работает
<b>... was seen to ...</b>	— Видели, что...
<b>... was heard to ...</b>	— Слышали, что...
<b>... was supposed to ...</b>	— Предполагали, что...
<b>... was believed to ...</b>	— Полагали, что...
<b>... was expected to ...</b>	— Ожидали, что...
<b>... was reported to ...</b>	— Сообщали, что...
<b>... was considered to ...</b>	— Считали, что...
<b>... was thought to ...</b>	— Думали, что...
<b>... was found to ...</b>	— Обнаружили, что...
<b>... was announced to ...</b>	— Объявили, что...
<b>... was known to ...</b>	— Было известно, что...

*Exercise 4. Translate these sentences paying attention to Complex Subject.*

1. Anna Mutter is believed to be one of the finest violinists in the world.
2. False friends are said to be like autumn leaves found everywhere.
3. He is believed to be innocent of the crime.
4. He is considered to be the richest man in the world.
5. He was expected to pass the mathematics exam.
6. He was said to have known the whole truth about it.
7. Innocent people were announced to have been murdered by terrorists.

8. Yuri Gagarin is known to be the first man in the world to travel into space on the 12th of April, 1961. 4. He is supposed to be a very good film actor.
9. Leonardo da Vinci is known to be a great Italian painter of the Renaissance. The Mona Lisa is considered to be one of his most famous works.
10. Monet's painting is reported to be on exhibition until the end of the month.
11. Mother is said to know the right thing to do.
12. Sergei is thought to have a gift for languages. His English is known to be excellent.
13. She is said to borrow money but not bother to return it.
14. The American astronaut Neil Armstrong is known to be the first man to walk on the moon in 1969.
15. The exhibition of 19th-century French painting is expected to open by the end of next week.
16. The President of Russia was reported to speak to the nation on television tonight.
17. The students were supposed to come on time and take part in the marathon.
18. The terrorist was announced to have been killed by his own bomb.
19. True friends are known to be like diamonds, precious but rare.
20. You are expected to be an obedient and smart boy.
21. You are supposed to check your change before you leave the cashier.
22. He is said to know all about it.

***Exercise 5. Change these sentences using Complex Subject.***

• E.g. **We *heard* that a car stopped** outside the door. **A car *was heard* to stop** outside the door. **It is *believed* that the poem was written** by Byron. **The poem *is believed* to have been written** by Byron.

1. It is believed that the poem was written by an unknown soldier.

2. It is expected that the performance will be a success.
3. It is said that the book is popular with both old and young.
4. It is supposed that the playwright is work
5. It was announced that the Chinese dancers were arriving next week.
6. People consider the climate there to be very healthy.

В предложениях, содержащих *Complex Subject*, глаголы *to appear, to happen, to seem, to turn out*, употребляются в *Active Voice*:

*Exercise 6. Translate these sentences paying attention to Complex Subject*

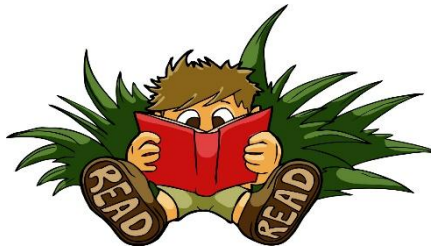
1. "Jim," he said at last, in a voice that did not seem to belong to him.
2. Clyde appeared to have forgotten of his promise to spend his spare evenings with Roberta.
3. Clyde seemed to have been thinking of no one else but Sondra since their last meeting.
4. From the very first mention of Long John, I was afraid that he might turn out to be the very one-legged sailor whom I had watched for so long at the inn.
5. He appeared to be an ideal man.
6. He turned out to have no feeling whatever for his nephew.
7. His office turned out to be in one of the hack streets.
8. In the middle of the lecture Dr. Sommerville happened to pause and look out of the window.
9. Irving turned out to be a long, pale-faced fellow.
10. Money just doesn't happen to interest me.
11. One day a Hare happened to meet a Tortoise.
12. She appeared to be an excellent actress.
13. She doesn't seem to want to do anything I suggest.
14. The apparatus seemed to be in excellent condition.

15. The Gadfly seemed to have taken a dislike to Signora Grassini from the time of their first meeting.
16. The Hare turned out to be the loser of the race.
17. The new method of work appears to be very effective.
18. The operation seemed to be a complicated one.
19. The peasants did not seem to see her.
- 20. The percentage of carbon in this steel turned out to be low.**
21. The Tortoise seemed to be moving very slowly.
22. This appeared to amuse the policeman.
23. This work seems to take much time.
24. You appear to have found in him something that I have missed.
25. You can easily get in through the window if the door happens to be locked.
26. You don't seem to have done any great thing for yourself by going away.

*Exercise 7. Translate these sentences using Complex Subject.*

1. Я случайно знаю номер его телефона.
2. Я случайно встретил его в Москве.
3. Условия работы оказались более трудными, чем предполагалось.
4. Сообщают, что экспедиция достигла места назначения.
5. Рочестер случайно встретил Джейн по дороге домой.
6. Предполагают, что заседание закончится в десять часов.
7. Полагают, что поэма „Беовульф" была написана в VIII веке.
8. Полагают, что они знают об этом больше, чем хотят показать.
9. Он, кажется, пишет новую статью: кажется, он работает над ней уже две недели.
10. Он оказался хорошим спортсменом.
11. Оказалось, что мы уже когда-то встречались.
12. Новые автобусы оказались очень удобными.
13. Никак не ожидали, что холодная погода наступит так рано.
14. Книга, которую вы мне дали, оказалась скучной.

15. Как известно, английская писательница Войнич жила в течение нескольких лет в Петербурге и изучала русскую литературу. Считают, что русская литература оказала влияние на ее творчество.
16. Известно, что римляне построили на Британских островах хорошие дороги.
17. Из трех сестер Бронте Шарлотта считается наиболее талантливой.
18. Джим оказался храбрым мальчиком.
19. Говорят, что это здание было построено в XVII веке.
20. Говорят, что эта статья переведена на все языки мира.
21. Говорят, что он работает над своим изобретением уже несколько лет.
22. Вы, кажется, устали.
23. Вы, кажется, много читали до поступления в университет.
24. Вы случайно не знаете этого человека?
25. Ваш приятель, кажется, очень интересуется древней историей.
26. Вальтер Скотт считается создателем исторического романа.



## 4.SUPPLEMENTARY READING

### MICROCOMPUTER APPLICATIONS

Personal microcomputers are often used for education and entertainment. Beyond laptops and desktops, microcomputers can include video game consoles, computerized electronics and smartphones.

In the workplace, microcomputers have been used for applications including data and word processing, electronic spreadsheets, professional presentation and graphics programs, communications and database management systems. They have been used in business for tasks such as bookkeeping, inventory and communication; in medical settings to record and recall patient data, manage healthcare plans, complete schedule and for data processing; in financial institutions to record transactions, track billing, prepare financial statements and payrolls, and auditing; and in military applications for training devices, among other uses.

### Microcomputers and IoT

The Raspberry Pi, a small, single-board computer, was once self-described as a microcontroller. Today used for internet of things (IoT) prototyping, education and applications, the Raspberry Pi and other single-board computers, such as those from Arduino, Intel and Particle, are more often described as microcontrollers than microcomputers.

Microcomputers can be used for similar tasks in IoT applications as microcontrollers, however. Certain IoT devices, such as smart TVs, refrigerators and other connected appliances, are sometimes referred to as microcomputers.

## Where a microcomputer fits in

The ascending hierarchy of general computer sizes is as follows:

- Embedded systems, which are fixed inside something and don't support direct human interaction but nonetheless meet all other criteria of microcomputers;
- Microcomputers;
- Workstations, formerly described as a more powerful personal computer for special applications;
- Minicomputers, now called mid-range servers;
- Mainframes, which are now usually referred to by manufacturers as large servers;
- Supercomputers, large servers, sometimes including systems of computers using parallel processing; and
- Parallel processing system, a system of interconnected computers that work on the same application together, sharing tasks that can be performed concurrently.

## Microcomputers vs. microcontrollers

A microcontroller is an integrated circuit (IC) designed to govern a specific operation in an embedded system. These single chips have onboard RAM, ROM and peripherals.

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation.*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*



## **APPLICATION AND TYPES OF COMPUTER APPLICATIONS**

The term Application refers to Software which is a set of instructions or code written in a program for executing a task or an operation in a Computer. Applications play a vital role in a Computer as it is an end-user program that enables the users to do many things in a system. The application programs are designed and developed to run in a System Software which is an Operating system. An Operating System is system software that enables all the applications programs to run and execute various tasks in a Computer system. The GUI based applications carries out various tasks in a Computer like creating documents, playing games, browsing and many more.

### **Application Software Overview:**

Application software's are the end-user programs designed to enhance the productivity in various fields of work. The applications are used for creating documents, spreadsheets, databases, and publications, doing online research, sending email, designing graphics, running businesses, and also playing games. Application software's are designed to perform a specific task and can be as simple as a calculator application or as complex as a word processing application. The applications are designed with built-in functions and properties so to easily carry out all the operations. One of the most popular and widely used applications is Microsoft word processor where you can do calculations, copy, paste, delete, and add colors and pictures, change the appearance by using its built-in properties. Not only Word processor applications but there are several other productivity programs like Graphical software, Photo studio, Antivirus and many more that are packed as an Application software.

Application software cannot run itself as it requires system software for executing the programs. System software like Windows, Mac, Linux and many more helps the application software's to run and execute in a Computer. As a Computer needs an Operating system, an Operating system needs Application software's, so without applications the computer is nothing but a blank page.

Since the system software's also integrates some built-in application programs when installed on a computer that can be used. But there are several applications like Microsoft Office which is a complete suite of programs that includes Excel, Power point, Access etc, Graphic suites like Adobe Creative suite with various applications for creating and editing images, Audio master suite for sound production, Video editing applications, Security software's and most importantly Web-browser which is also application software.

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## **SYSTEM SOFTWARE AND APPLICATIONS SOFTWARE**

Application Software can be divided into two broad categories are System Software and Applications Software.

- **System Software** is a program designed to manage all the hardware resources and also runs the applications programs in a Computer. It is mainly of two types are the Operating system and utility software that is installed with the Operating system. The Operating system and utility programs are written in such a way to function independently because they are not user oriented. It always runs in the background and executes all the operations in a Computer. But there are some system software's that are used by the end-users like a Device manager which is found on Control panel.

Operating systems like Windows, Mac, Linux, and UNIX are the best examples that manage all the programs in a Computer. Since there are other systems software's that help the OS to perform all the tasks like BIOS (Basic

Input/output system) that manages data flow between OS and other attached devices such as keyboard, mouse, hard drives etc. Boot program loads the Operating system to RAM, an Assembler takes basic instructions and converts them to machine language to perform operations and a Device manager controls all the devices attached to Computer. The utility software's like disk derangement, system restore, compilers and debuggers are also installed on the Operating system software.

- **Application Software** is a program or a group of program designed for the end-user to perform a specific task in a Computer. The user directly interacts with the application programs for performing a task in a system. Some of the applications software's are browsers, e-mail clients, word processors, spreadsheet, database programs and many more that has various built-in functions to be used. Furthermore the Applications Software's are also broadly categorized for better productivity. Some of them are:-

**Application suites** are packed with multiple programs with user interfaces, features and functions to interact with the users. Some of them are Microsoft Office, Adobe Creativity suite, Security suite, Gaming apps and many more. **Enterprise Software** labels the organization requirements and also manages data flow in a huge environment. It may be an automated billing system, e-mail marketing, business intelligence and Content management.

**Enterprise Infrastructure Software** provides the capabilities required to support enterprise software systems. It is mainly used for businesses, society or Organization for network security, surveillance system, transportation, sewage, communication, electricity and water that need high investment for the systems.

**Educational Software** includes all the contents of different subjects that can be used by a student or any individuals. There are several websites providing educational software about various topics and vast database makes it an easy to use application.

**Multimedia Software** is used for development of media in our day to day life. There are various audio, video and image editing tools, printing media that can be used to maximize the growth of a business.

**Content Access Software** is used to access the contents in a website for publishing digital contents and entertainment.

**Information Software** is used for addressing the needs of an individual by creating and managing information for individual projects within the department. It may be the word processors, spreadsheets, e-mail or blog clients etc.

*Exercise 1. Read and translate the text*

*Exercise 2. Write down unknown words and word-combinations with transcription and translation.*

*Exercise 3 Put 10 special questions to the text*

*Exercise 4. Discuss with your group-mates main problems of the text.*

*Exercise 5. Make a summary of the text and be ready to tell it*

## **PERSONAL COMPUTERS.**

Personal computers use telecommunications to provide a transmission link for the delivery of audio, video, text, software, and multimedia services. Many experts believe that the convergence of these services will generate consumer demand for new generations of high-speed, broadband networks. Currently, the delivery of most of these audio, video, and text services occurs over existing telephone connections using the Internet. Some computers connect directly to the digital portion of the telephone network using the Integrated Services Digital Network (ISDN) or Digital Subscriber Lines (DSL), but this requires special equipment at user locations.

Telephone and cable television companies must also make upgrades to their lines so that they can handle high-speed data transmission. In many locations companies and individuals with highspeed data requirements now have

the option of securing DSL service from telephone companies and cable modem service from cable television companies.

Electronic mail, or e-mail, is a key attraction of the Internet and a common form of computer telecommunications. E-mail is a text-based message delivery system that allows information such as typed messages and multimedia to be sent to individual computer users.

Local e-mail messages (within a building or a company) typically reach addressees by traveling through wire-based internal networks. E-mail that must travel across town or across a country to reach the final destination usually travels through the telephone network.

Instant messaging is another key feature of computer telecommunications and involves sending text, audio, or video data in real time. Other computer telecommunications technologies that businesses frequently use include automated banking terminals and devices for credit card or debit card transactions. These transactions either bill charges directly to a customer's credit card account or automatically deduct money from a customer's bank account.

## **EXERCISES**

**I. Найдите в тексте соответствующие выражения на английском языке:**

*вознагражденные славой и богатством, для личного пользования; значительная роль; выполнять заказы; испытывать недостаток в фондах; быть вынуждены; менее одной восьмой дюйма; рассматривать как; самодельный (временный) конвейер; приходить в голову; чувствительный к нуждам; убедить скептиков; тем самым; дать возможность; съемные платы; поддержать интерес к; немецкие беженцы; ежегодная продажа; тогда как; конкурентная среда; неизбежные неудачи; сделать привлекательным; предвидеть потенциал; технические знания; одеваться неформально; слишком дорогая; существующая тогда технология;*

## 1. False or true?



1. Alpert's interest in technology was more passionate than his interest in medicine.
2. Jobs did not want the PC to be as intimidating to the general public as previous computers were, so he insisted that it include features that were practical and attractive.
3. Martin Alpert foresaw that the success of the first IBM personal computer was inevitable, so he bought the first two models and devised ways to change them.
4. Martin Alpert's wife was skeptical about the potential of her husband's technical innovations.
5. Robert Noyce graduated from a prestigious university and gained engineering expertise before he devised the integrated circuit.
6. When Wozniak designed the first model of the PC, he did not plan to market it to the general population.
7. The microprocessor influenced the world in ways that its inventors did not foresee and subsequently led to the invention of the integrated circuit.
8. The Apple Computer company sold their computers to thousands of American schools at discounted rates, thereby introducing their product into the homes of millions of students.
9. Stephen Wozniak and Steven Jobs used the state-of-the-art technology developed by Robert Noyce when they devised the first personal computer.
10. Robert Noyce was one of the pioneers of the computer industry.

**III. К словам, данным в скобках, подберите синонимы:**

1. Martin Alpert's wife was never (doubtful) about (the future possibilities) of Tecmar.
2. People seemed to be less (frightened) by computers when they were made in (soft) colors and were (easily understood by the average person).
3. Robert Noyce's (specialization) in computers was a result of his experience with the (first people) in the computer field while working at his first job.
4. Stephen Wozniak applied the (most up-to-date) (applied science) when designing the first personal computer, while Steven Jobs designed its (practical functions).
5. Steven Jobs and Stephen Wozniak (worked together) to (invent) the personal computer, and then produced it in a (temporary) production line in a garage.
6. Steven Jobs wanted to (advertise and sell) the personal computer to people who would use it in their homes, so he knew it could be neither (very large) nor (awkward).
7. Whereas some people (grow) as a result of competition, others are (threatened) by it.
8. Martin Alpert studied the first IBM personal computer (with great love and emotion), and (by that means) he was the first innovator to (come forward) with (supplementary devices) for the computer.

**IV. Some of the following statements describe an act of an entrepreneur (E), others describe an act of an inventor (I), and others could describe both titles (B).**

**Распределите в три колонки и объясните ваш выбор**

1. Steven Jobs had the original idea to market the first personal computer.

2. Robert Noyce's financial investments helped build one of the most successful companies in the Silicon Valley.
3. Robert Noyce's engineering expertise contributed to the development of the microprocessor.
4. Robert Noyce co-invented the integrated circuit and co-founded Intel.
9. Martin Alpert's wife managed his business and marketed his products.
10. Martin Alpert devised many new products for the personal computer.
5. King C. Gillette designed the first disposable razor blade.
6. In 1890 John Loud created the first ballpoint pen.
7. Alexander Graham Bell originated the first telephone.
8. A Frenchman named Benedictus introduced the idea of making safety glass in 1903 after he discovered a chemical that held broken glass together.

**V. What are the relationship between each of the following pairs of**

anticipate /foresee together

cumbersome/awkward potential/ability

expertise/innovation donate/loan

inevitable/avoidable genuine/insincere

massive/small skeptical/unfriendly

muted/bright collaborated/worked

venture/risk devise/invent

words (antonyms, synonyms, neither):

makeshift/permanent



**VI. Choose the word to complete each of the following sentences:**

1. It was Wozniak's (expertise/skepticism) that made it possible for him to devise the first personal computer.
2. The computer enthusiast devised a portable model that had several practical (applications/markets) for educators.
3. The executives bought a (cumbersome/portable) copy machine because they needed to take it to meetings.
4. The government (loaned/donated) \$100 million to the corporation, expecting it to be repaid with 12 percent interest.
5. The investors (anticipated/intimidated) the higher profits because of the activity in the stock market.
6. The new computer program was (collaborated/devised) by the newest student in the class.
7. When computers are not working, it is (inevitable/avoidable) that work will be delayed.
8. Whenever the inventor was working on an innovation, she (emerged from/withdrew to) her house because she didn't want to be disturbed.

**TEXT 4 THE PROCESSOR**

*1. Study the word-combinations:*

arithmetic-logical unit (ALU) – арифметико-логическое устройство

bus – шина; канал; линия (передачи данных)

call for – требовать; предусматривать

capability – способность; возможность

central processing unit (CPU) – центральный процессор (ЦП)

clock – часовой механизм

control unit (CU) – устройство управления

expansion slot – разъем для модуля расширения

fan – вентилятор

fin – *зд.* ребро, заусенец

input-output port – порт ввода-вывода

internal memory – внутренняя память; внутреннее ЗУ

register – регистр; счетчик; датчик; устройство регистрации

response – ответ; отклик; реакция; отвечать; реагировать

sink – *зд.* корпус

step-by-step operations – пошаговые операции

to interpret – интерпретировать; истолковывать

to issue – посылать (сигнал); выводить, выдавать (сообщение)

to load – загружать; выполнять загрузку

The microprocessor is the component of the personal computer that does the actual processing of data. A microprocessor is a central processing unit (CPU) that fits on one microchip. It is the “brain” of the computer, but that is a rather pretentious term since it really just a very complex switching circuit that executes simple instructions very rapidly.

The microprocessor integrated circuit package holds a silicon chip that contains millions of transistors and other components fabricated into the silicon.

Because the transistors on the chip are very tiny, even a small zap of high voltage current (such as from static electricity) can destroy a chip. This is why all largescale integrated circuits must be handled in ways that minimize the possibility of static electric discharge.

Because of the large amount of circuitry packed into such a tiny area, microchips produce a lot of heat and they require cooling systems to keep the chip from overheating. On computer motherboards the CPU chip is covered by a large metal *heat sink* with “fins” to allow airflow from *cooling fans* to carry the heat away.

There are three typical parts:

- the *control unit*, which examines instructions from memory and executes them;

- the *arithmetic and logic unit (ALU)*, which performs arithmetic and logical operations;

- the *registers*, high-speed units of memory used to store and control data.

The speed of a processor is measured in *gigahertz (GHz)*. Thus, a CPU running at 4 GHz can make about four thousand million calculations a second. An internal *clock* sends out signals at fixed intervals to measure and synchronize the flow of data.

The main circuit board is known as the *motherboard*. This contains the CPU, the memory chips, expansion slots and controllers for peripherals, connected by internal *buses*, or paths, that carry electronic signals. For example, the *front side bus* carries all data that pass from the CPU to other devices.

*Expansion slots* allow you to install *expansion cards* which provide extra functions, e.g. a video card or a modem. Laptops have PC cards, the size of a credit card, which add features like sound, memory and network capabilities.

**2. Look through the text then match the sentence beginning (1-6) with the correct endings (a-f):**

- 1) The CPU processes data and a) you can't make changes to it.
- 2) The control unit is the part of the CPU that b) the computer is turned off.
- 3) The arithmetic and logic unit is able to make c) controls the way instructions are executed.
- 4) The registers are high-speed storage d) areas within the CPU.
- 5) Data contained in RAM is lost when e) coordinates the other parts of the computer
- 6) ROM memory can only be read: f) calculations: add, subtract, multiply and divide.

**1. Answer the questions:**



# Questions and Answers

1. Where are data to be processed loaded into?
2. Where are data processed?
3. What operations are performed in the ALU?
4. What function of the CU do you know?
5. What are the CPU functional units made of?
6. Name the sequence of operations the CPU performs.
7. In what way does the CPU control the operation of the whole system?
8. What is the function of the CPU?
9. What components make up the heart of the computer system?

**4. Remember the meaning of the words and try to translate the combinations with these words:**

*Step:* final step; procedure step; conversion step; program step; step by step; programming step; one step at a time; to step down; to step out; to step up; to take steps.

*Level:* application level; data level; access level; difficulty level; error level; function level; hardware level; high level; input level; output level; performance level; presentation level; device level; program level; protection level; resource level; software level; structural level system level; transmission level; security level..

*Direction:* backward direction; negative direction, positive direction; printing direction; transmission direction.forward direction; inverse/reverse direction; data direction; counter-clockwise direction; clockwise direction;

*Switch:* to switch between programs; to switch between windows; to switch disks; to switch on; to switch off; to switch over; binary switch; command switch.

*Processor:*

message processor; numeric processor; parallel processor; peripheral processor; text processor; language processor; mail processor; error processor; general – purpose processor; special – purpose processor; image processor; data processor; control processor; command processor; central processor; arithmetic processor;

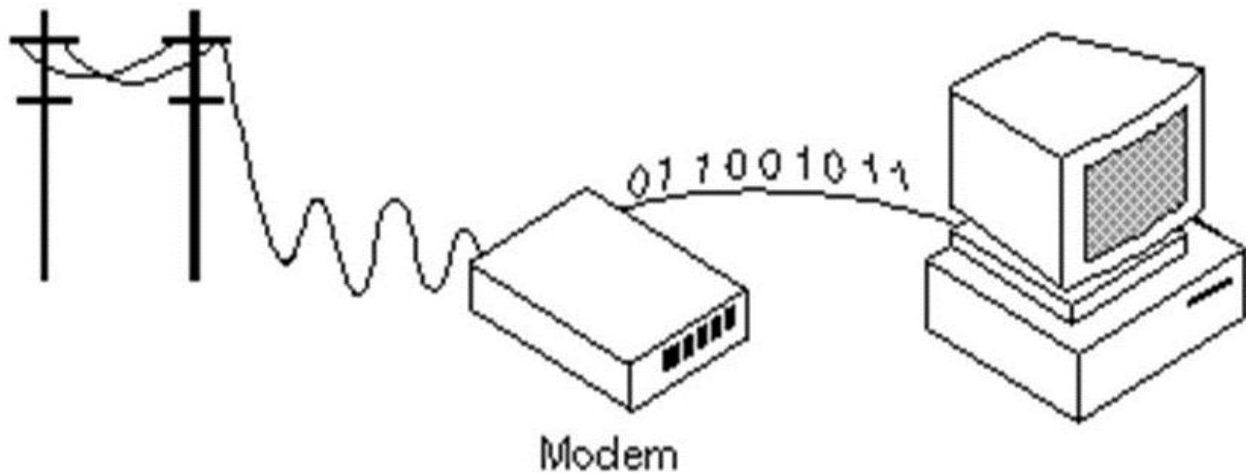
### ***5. Translate into English:***

Управлять работой всей системы; управлять ходом выполнения программы; порт ввода-вывода; режим включения-выключения; электрическая цепь; выполнять инструкции; сложная интегральная схема; материнская плата; разъем для модуля расширения; выполнить вычисления.

## UNIT VI MODEM

# What is MODEM

Short for *modulator-demodulator*



### 1.MODEM: DEFINITION. TYPES

## WHAT IS MODEM.?

- Modem, short for modulator-demodulator is an electronic device that converts a computer's digital signals into specific frequencies to travel over telephone or cable television lines. At the destination, the receiving modem demodulates the frequencies back into digital data. Computers use modems to communicate with one another over a network.

A modem is the piece of equipment that allows a computer to communicate with other computers over telephone lines. A **modem** may refer to any of the following:

#### Cable Modem



ComputerHope.com

1. A **modem** or **broadband modem** is a hardware device that connects a computer or router to a broadband network. For example, a cable modem and DSL modem are two examples of these types of Modems.

#### Tip

Today, a "modem" is most often used to describe a broadband modem. However, it also describes what was initially considered a modem (described below) to connect to the Internet. To help prevent confusion, use the terms "broadband modem" and "dial-up modem."

#### Note

A broadband modem is an external device that connects to your computers and other network devices using either a network cable or over a wireless connection.

2. Short for **modulator/demodulator**, a **modem** is a hardware device that allows a computer to send and receive information over telephoned lines. When sending a signal, the device converts ("modulates") digital data to an analog audio signal, and transmits it over a telephone line. Similarly, when an analog signal is received, the modem converts it back ("demodulates" it) to a digital signal.

#### Tip

To help prevent confusion between a broadband modem, you can refer to this modem as a dial-up modem.

The picture below is an example of an internal expansion card dial-up modem. Click the image to get a description of each component on the card.

Internal computer Modem expansion card



Modems are referred to as an **asynchronous device**, meaning that the device transmits data in an intermittent stream of small packets. Once received, the receiving system then takes the data in the packets and reassembles it into a form the computer can use.

<b>Stop</b> 1 bit	<b>Data</b> 8 bits	<b>Start</b> 1 bit	<b>Stop</b> 1 bit	<b>Data</b> 8 bits	<b>Start</b> 1 bit
<b>Packet</b> 10 bits			<b>Packet</b> 10 bits		

The above chart represents how an asynchronous transmission transmits over a phone line. In asynchronous communication, one byte(eight bits) is transferred within one packet, which is equivalent to one character. However, for the computer to receive this information, each packet must contain a Start and a Stop bit; therefore, the complete packet would be ten bits. The above chart is a transmission of the word **HI**, which is equivalent to two bytes (16 bits).

### TYPES OF COMPUTER MODEMS

Below are the four versions of a computer modem found in computers.

**Onboard modem** - Modem built onto the computer motherboard. These modems cannot be removed but can be disabled through a jumper or CMOS setup.



**Internal modem** - Modem that connects to a PCI slot inside a newer desktop computer or ISA slot on an older computer. The internal modem shown at the beginning of this document is an example of a PCI modem.



**External modem** - Modem within a box that connects to the computer externally, usually the serial ports or USB port. The picture is an example of an external USRobotics modem.

**Removable modem** - Modem used with older laptopsPCMCIA slot and can be added or removed as needed.

Where does Internal Modem plug?

1. When can you modem and telephone share one line?
2. What type of data is using in computers?
3. What problems arise when you use internal modems?
4. What kinds of modems do you know?
5. What kinds of modem do you know?
6. What kind of modem is usually cheaper?
7. What is the technology of using the telephone?
8. What is the piece of equipment that allows a computer to communicate with other computers over phone lines?
9. What is called a modem?
10. What is a bridge between digital and analog signals?
11. What does the modem allow?
12. How does the modem get its name?
13. How does the modem change information?
14. How can you use a computer modem?

## 2.THE HISTORY OF MODEM

This remarkable device, the modem (from MOdulator—DEModulator) heralded a new age of communications and played a major role in the explosion of the internet.

Modems were in action in teletype services since the 1920s. To send telegrams and cablegrams via teletype, the serial RS-232 standard was developed and used for teletype machines which could communicate with each other over phone lines. Each teletype would be physically connected to its modem (working on 110 bps) via an RS-232 connection and the modems could call each other to establish a remote connection between the teletypes. What one typed at a teletype (or had saved on punched paper tape) could be printed on a remote teletype located far away. No computer was involved.

In 1940 [George Stibitz](#) connected a New Hampshire teletype to a computer in New York by phone lines and [developed further the idea](#) of remote, multiple access to a computer.



**AT&T's modem from 1958**



**300 baud Hayes modem**

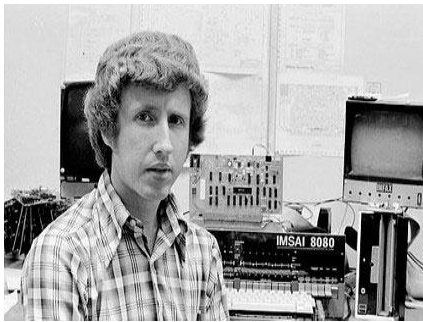
When the US Air Force needed a convenient way of transmitting hundreds of radar images to command centers during the Cold War in the end of 1940s, they turned to the telephone system and modems as a solution. Thus in 1949 the group of John (Jack) V. Harrington (1919-2009) at the Air Force Cambridge Research Center (AFCRC) near Boston developed a device for transmitting radar signals, modulating digital data into sounds, and demodulating received sounds into digital data. It was the first telephone-line modem.

In 1950s the old 110 bps modem was enhanced by Bell Laboratories (division of the US company AT&T) to improve upon the Teletype speed of

approximately 150 bits per second (bps).

In 1960 AT&T came out with a 300 bps modem (for use on its phone system), and in 1962 it started selling *Bell 103* modems to the public (see the nearby image). Such slow and expensive modems were later mainly used for transmitting data between mainframe computers or for connecting a dumb terminal to a mainframe computer over phone lines. Many dumb terminals didn't even have a screen display, but printed on paper what you typed at the keyboard along with responses from the computer.

The first PC modem (*80-103A*) was created in 1977, by Dale Heatherington and Dennis Hayes (see the lower image).



***Dale Heatherington with  
IMSAI 8080 computer***

Dennis Hayes (born 1950) met Dale Heatherington (born 1948) at National Data Corporation, when he worked after concluding his studies at Georgia Institute of Technology.

One day, over lunch, sitting once on a dining room table in Hayes' home, Dennis and Dale decided to start a company—*Hayes Associates*, with a modest \$5000 investment and this boot-strapped company will become the leader in the industry. They drew out on paper napkins his idea to provide a way for the earliest microcomputers to communicate with other computers via telephone lines. The first products were modem boards for the *S-100* bus, then for the *Apple II* computers, which were sold to computer hobbyists in April of 1977.

Solving the interface problems to allow any computer using a standard serial port to control the modem functions with software, they invented the Hayes Standard AT command set, introducing the first PC modem in June 1981.

During the 1980s and 1990s, *Hayes* was a premium brand with a reputation for high compatibility and reliability. At its peak, its market share was some 50 percent, and computer magazines encouraged their readers to shy away from any modem that was not Hayes-compatible. Later Hayes, which was one of

the strongest brands for 10-20 years, would face financial problems, and in 1990s go out of business.

Heatherington retired in 1985, taking \$20 million for his share in the company. Hayes went bankrupt in 1998 and its assets were liquidated. The brand name was purchased and revived by onetime rival Zoom.

***Exercise 1. Read and translate the text***

***Exercise 2. Write down unknown words and word-combinations with transcription and translation.***

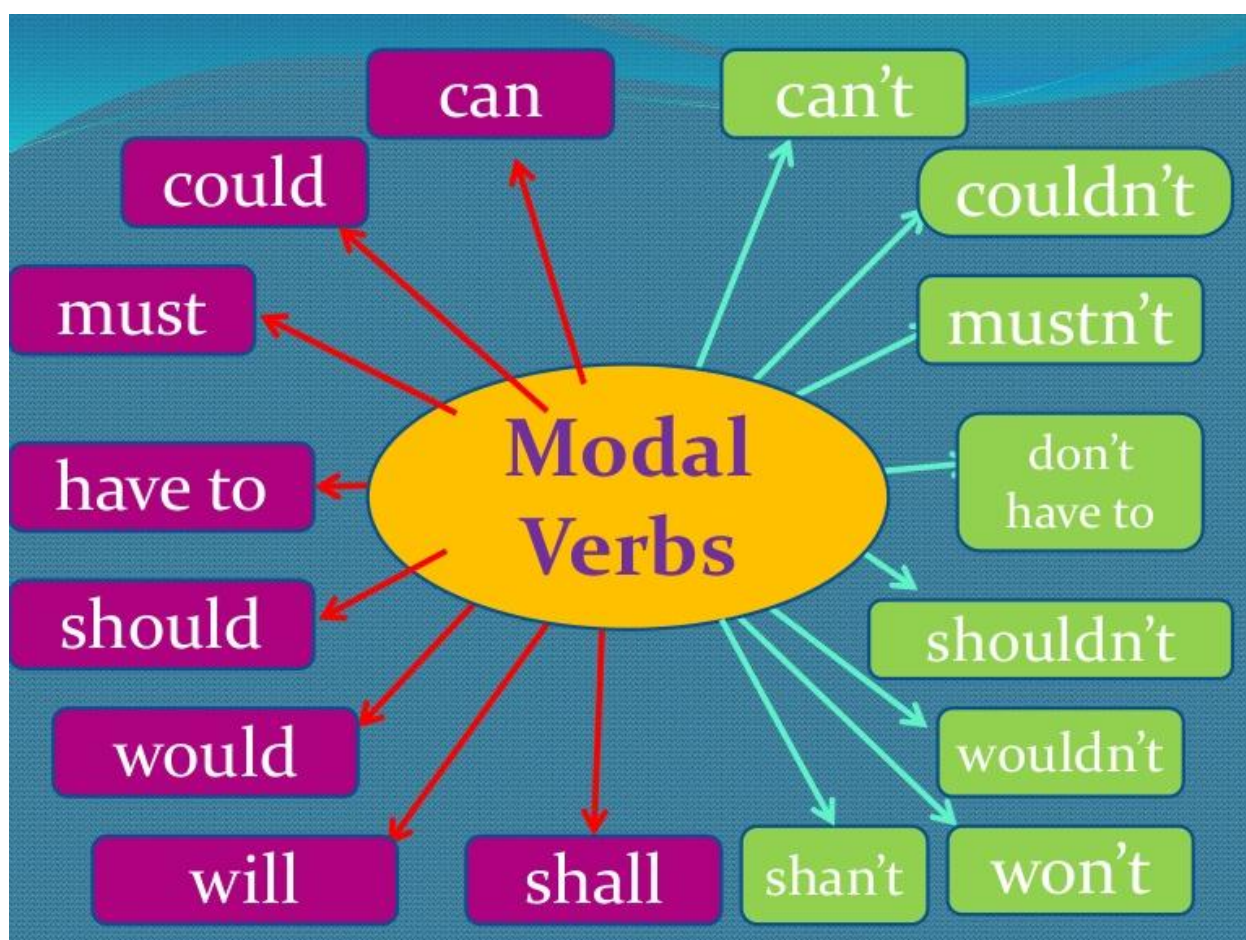
***Exercise 3 Put 10 special questions to the text***

***Exercise 4. Discuss with your group-mates main problems of the text.***

***Exercise 5. Make a summary of the text and be ready to tell it***

### 3. MODAL VERBS AND THEIR EQUIVALENTS:

#### GRAMMAR RULES AND EXERCISE



## Modal verbs and their equivalents

### *Модальные глаголы и их эквиваленты*

**Can/ to be able (to)/ may/to be allowed (to)/**

**must/ ought (to)/ to have (to)/**

**to have got (to)** (британский разговорный

вариант) /**to be (to) / to be obliged (to)/ shall/**

**should/ will/ would**

*Модальные глаголы выражают отношение к действию (его необходимость, вероятность, возможность его совершения и др.).*

MODAL	EXAMPLES	USES
CAN	He can find any street in London.	<i>Ability</i>
	You can take a taxi.	<i>Suggestion</i>
	Can you take me to Victoria Station?	<i>Request</i>
BE ABLE TO	He is able to find any street in London.	<i>Ability</i>
CAN'T	That story can't be true.	<i>Certainty that something is impossible</i>
COULD	I could play tennis when I was younger.	<i>Ability</i>
	Could you take me to Victoria Station?	<i>Request</i>
	You could take a taxi.	<i>Suggestion</i>
MAY	It may be quicker to travel by train.	<i>Possibility</i>
	May I come in?	<i>Formal request/Permission</i>
MIGHT	It might be quicker to travel by train.	<i>Possibility</i>
MUST	You must be back at 10 o'clock.	<i>Obligation</i>
	Look at the snow. It must be cold outside.	<i>Certainty that something is true.</i>
HAVE TO	You have to be back at 10 o'clock.	<i>Obligation</i>
NEED TO	You need to study a lot.	<i>Obligation.</i>
NEEDN'T	You needn't have a university degree.	<i>Lack of obligation.</i>
MUSN'T	You mustn't drive without a license.	<i>Prohibition</i>
DON'T HAVE TO	You don't have to call a taxi.	<i>Lack of obligation</i>
SHOULD	You should drive more carefully.	<i>Opinion/Advice</i>
OUGHT TO	You ought to drive more carefully.	<i>Opinion/Advice</i>

## Modal verbs

- **Модальный глагол SHOULD**
- С помощью этого глагола мы обычно выражаем:
- **Долг, обязанность (ослабленные до совета или упрека).**
- *A gentleman should be honest in his action.* – Джентльмену следует быть честным в своих поступках (деяниях).
- *If you want to succeed, you should have knowledge, experience and patience.* – Чтобы добиться успеха, нужно обладать знаниями, опытом и терпением.
- **Удивление, недоразумение, возмущение в вопросительных предложениях (эмоциональная речь) после слов why/how.**
- *How should I know?* – А откуда мне знать?
- *Why should she lie?* – Чего ради ей лгать?

## Modal verbs

- В отличие от таких **модальных глаголов английского языка** как **can** и **may**, у **модального глагола must** всего лишь одна форма – **must** в простом настоящем времени. И эта форма указывает на то, что действие относится к настоящему или будущему времени. Например:
- *He must take better care of himself.* – Ему надо лучше следить за собой.
- *Must you leave tomorrow?* – Тебе нужно завтра уезжать?
- В **косвенной речи в английском языке модальный глагол must** не претерпевает никаких изменений, да и согласование времен в данном случае не работает:
- *The boss said to the secretary that she must leave the office at 5 p.m.* – Начальник сказал секретарю, что она должна уходить с работы в пять часов вечера.

## Modal verbs

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- *Must you leave tomorrow?* – Тебе нужно завтра уезжать?
- В **косвенной речи в английском языке** **модальный глагол must** не претерпевает никаких изменений, да и согласование времен в данном случае не работает:
- *The boss said to the secretary that she must leave the office at 5 p.m.* – Начальник сказал секретарю, что она должна уходить с работы в пять часов вечера.

## Modal verbs

- Если мы встречаем **отрицательное предложение с модальным глаголом need**, помним, что в этом случае он будет выражать отсутствие необходимости, разрешение не делать что-либо (можно не делать или не пришлось делать).
- *We needn't work so much.* – Нам не нужно работать так много.
- И еще один нюанс: **модальный глагол need в отрицательной форме (needn't) в сочетании с перфектным инфинитивом** демонстрирует нам действие, которое было совершено, но **в котором не было никакой необходимости**.
- *You needn't have taken your umbrella.* – Ты напрасно взяла зонт.
- *I needn't have gone there.* – Зря я туда ходил.



## Modal verbs

- С помощью **can** мы можем не только просить разрешение, но и сами что-то предлагать.
- *Can I offer you a cup of tea?* – Я могу предложить Вам чашечку чая?
- *Can I help you choose a dress for the party?* – Я могу помочь тебе выбрать платье для вечеринки?
- **Удивление, сомнение, недоверие.**
- Переводится глагол *can* (*could*) в таких случаях словами «неужели», «не может быть», «вряд ли», «не верится», «возможно», «вероятно».
- *Can these shoes cost so much money?* – Неужели эти туфли столько стоят? (удивление)
- *He can't work all day round.* – Не может быть, чтобы он работал круглые сутки. (недоверие)

## Modal verbs

- **Разрешение, просьбу, запрет.**
- – *Can I take your car for the weekend?* – Я могу взять твою машину на выходные? (просьба)  
– *Yes, you can.* – Да, можешь. (разрешение)  
– *But you can't exceed the speed limit.* – Но нельзя превышать скорость. (запрет)
- Просьбу мы можем выразить с помощью *can* и *could*. Такие просьбы разнятся по степени вежливости.
- *Can you tell me where the nearest bus station is?* – Можешь сказать, где ближайшая остановка автобуса? (такое обращение скорее характерно, если вы общаетесь с человеком вашего же возраста)
- *Could you tell me where the nearest bus stop is?* – Могли бы Вы сказать, где ближайшая остановка автобуса? (это более вежливый вопрос, чаще англичане воспользуются именно таким вариантом, чтобы быть максимально вежливыми и учтивыми в беседе)

## Modal verbs

- **Ought to** - этот модальный глагол обладает только формой настоящего времени – . И стоит помнить, что **инфинитив**, используемый после этого модального глагола, обязательно употребляется с частицей *to*.
- *I ought to buy something for tea, biscuits or sweets.* – Мне нужно купить что-то к чаю, печенья или конфет.
- *You ought to have decided that.* – Вам следовало решить это давно.
- Модальный глагол *ought to* необходимо передавать в предложении при помощи таких слов, как «**надо (бы)**», «**следует**», «**следовало (бы)**», «**вы бы**». Если нам нужна отрицательная фраза, перед этими словами ставим отрицательную частицу «не».

## Modal verbs

- **Смысл модального глагола *to be to* состоит в том, что наличие этого глагола в предложении подразумевает предварительную взаимную договоренность о необходимости выполнения какого-либо действия.** Поэтому и **перевод этого модального глагола будет опираться на такую лексику, как «условились», «договорились», «должен был, обязан», «суждено», «собирались» и т.д.** Это можно очень четко рассмотреть на представленных примерах:
- *We are to decide it right now.* – Мы обязаны решить это прямо сейчас.
- *Who is to do the talking today?* – Кому сегодня предстоит вести разговор?
- *What am I to tell my parents?* – Ну и что мне теперь говорить родителям?

# Modal verbs

- **Модальные глаголы в английском языке** относятся к особой группе глаголов. Они **обозначают возможность, способность, необходимость и вероятность совершения действия.**
- **Значения, выражаемые модальными глаголами в английском языке**
- Модальные глаголы в английском языке **не употребляются самостоятельно**, а в сочетании с инфинитивом основного смыслового глагола, после них не ставится частица *to* (*исключение составляет ought*).
- I can do it. — Я могу сделать это.
- You ought to be there. — Вам следует быть там.

## I. Translate the sentences.

1. Your daughter could do this work herself.
2. Your friend might have informed them.
3. He should have shown his notes to the teacher.
12. You needn't come so late.
4. Would you tell us the way to the station?
5. They should have visited her, she was in the hospital.
13. We should be more attentive to her parents.
6. Nobody could translate this book.
7. Must I attend this birthday-party? - No, you needn't.
14. May I leave for a while? - Yes, you may.
8. Last spring we would often go to the country.
9. I asked him, but he wouldn't listen to me.
10. She has to do this task immediatly.

11. Who is to answer this question?

## II. Fill in the modal verbs.

*(could, must, should, needn't, can, would, ought to, have to, may)*

1. I ... not go to the cinema with them last Sunday, I ... revise the grammar rules and the words for the excersises.

2. My friend lives a long way from his office and ... wake up early.

3. All of us ... be in time for lessons.

4. When my friend has his French, he ... stay at the office after work. He (not) ... stay at the office on Monday, Wednesday and Friday and ... get home early.

5. ... you ... work hard to do well in your French?

6. ... we discuss this question now? No, we ... . We ... do it tomorrow morning.

7. I'm glad you ... come.

8. ... you ... come and have lunch with us next week? I'd love to.

9. Please send them that article. Oh, ... I do it right now?

## III. Fill in the modal verbs.

*(must, should, would, can, could, ought to, have to. needn't, may)*

1. Your daughter \_\_\_\_\_ have told about it.

2. You don't look well, you \_\_\_\_\_ consult the doctor.

3. You \_\_\_\_\_ take my dictionary.

4. Why \_\_\_\_\_ I give you my money?

5. They \_\_\_\_\_ not do this work themselves.

6. She \_\_\_\_\_ not speak any foreign language.

7. In winter we \_\_\_\_\_ often skate.

8. He \_\_\_\_\_ to help them, they need his help.

9. \_\_\_\_\_ I go with you ? No, you \_\_\_\_\_

10. \_\_\_\_\_ you tell me the time?

#### **IV. Translate the sentences.**

1. We should not have used that sort of steel.
2. This phenomenon should be explained by thermal expansion.
3. This building should have been constructed a year ago.
4. The tests of materials should have been conducted before their use.
5. The letter should have been sent yesterday.

#### **V. Translate the messages of the computer.**

1. Cannot recover non-removable drive X

- a) Не следует восстанавливать несъемный накопитель X
- б) Нельзя восстановить несъемный накопитель X
- в) Восстановите несъемный накопитель X

2. Target disk cannot be used for back-up.

a) Диск, на который осуществляется запись, не может быть использован для резервного копирования.

б) Не используйте диск, на который осуществляется запись, для резервного копирования.

в) Диск, на который осуществляется запись, может быть использован для резервного копирования.

3. Unable to create table in resident memory

- a) Возможно создать таблицу в резидентной памяти.
- б) Невозможно создать таблицу в резидентной памяти.
- в) Создайте таблицу в резидентной памяти.

4. Target diskette may be unusable.

- a) Дискета, на которую ведется запись, является непригодной.
- б) Дискета, на которую ведется запись, может быть непригодной.

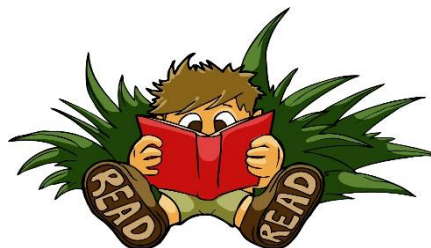
в) Дискета, на которую ведется запись, должна быть пригодной.

5. Drive letter must be specified.

а) Буква, определяющая дисковод, должна быть определена

б) Буква, определяющая дисковод, может быть определена

в) Буква, определяющая дисковод, определена



#### 4. Supplementary Reading

### WHAT IS A MODEM IN COMPUTER NETWORKING? DIAL-UP MODEMS GAVE WAY TO HIGH-SPEED BROADBAND MODEMS

A modem converts data to a signal so it can be easily sent and received over a phone line, cable, or satellite connection. For transmission over an analog telephone line—which was once the most popular way to access the internet—the modem converts data between analog and digital formats in real time for two-way network communication. In the case of the high-speed digital modems popular today, the signal is much simpler and doesn't require the analog-to-digital conversion.

#### History of Modems

The first devices called modems converted digital data for transmission over analog telephone lines. The speed of these modems was measured in baud (a unit of measurement named after Emile Baudot), although as computer

technology developed, these measures were converted into bits per second. The first commercial modems supported a speed of 110 bps and were used by the U.S. Department of Defense, news services, and some large businesses.

Modems gradually became familiar to consumers in the late 1970s through the 1980s as public message boards and news services like CompuServe were built on early internet infrastructure. Then, with the explosion of the World Wide Web in the mid and late 1990s, dial-up modems emerged as the primary form of internet access in many households around the world.

### Dial-Up Modems

Modems used on dial-up networks convert data between the analog form used on phone lines and the digital form. An external dial-up modem plugs into a computer at one end and a telephone line on the other end. In the past, some computer makers integrated internal dial-up modems into the computer.

Modern dial-up network modems transmit data at a maximum rate of 56,000 bits per second. However, the inherent limitations of public telephone networks often limit modem data rates to 33.6 Kbps or lower.

When you connect to a network through a dial-up modem, the modem relays through a speaker the distinctive handshaking sounds between your device and the remote modem. Because the connection process and data patterns are similar each time, hearing the sound pattern helps you verify whether the connection process is working.

### Broadband Modems

A broadband modem like those used for DSL or cable internet access uses advanced signaling techniques to achieve dramatically higher network speeds than earlier-generation dial-up modems. Broadband modems are often referred to as *high-speed modems*. Cellular modems are a type of digital modem that establishes internet connectivity between a mobile device and a cell phone network.

The word *modem* is a mashup of the term *modulation/demodulation*, which is the technical term for the conversion between digital and analog signals.

External broadband modems plug into a home broadband router or other home gateway device on one end and the external internet interface such as a cable line on the other. The router or gateway directs the signal to all the devices in the business or home as needed. Some broadband routers include an integrated modem as a single hardware unit.

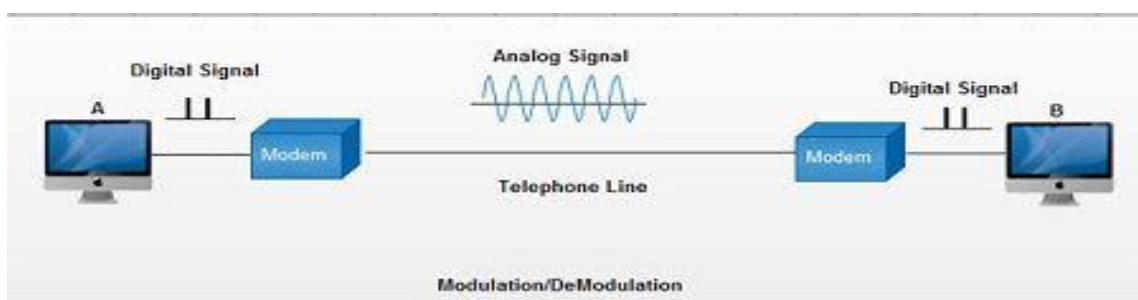
Many broadband internet providers supply suitable modem hardware to their customers at no charge or for a monthly fee.

## **TEXT 2** Modem: What is a Modem? Types of Modems

**Modem is abbreviation for Modulator – Demodulator.** Modems are used for data transfer from one computer network to another computer network through telephone lines. The computer network works in digital mode, while analog technology is used for carrying messages across phone lines.

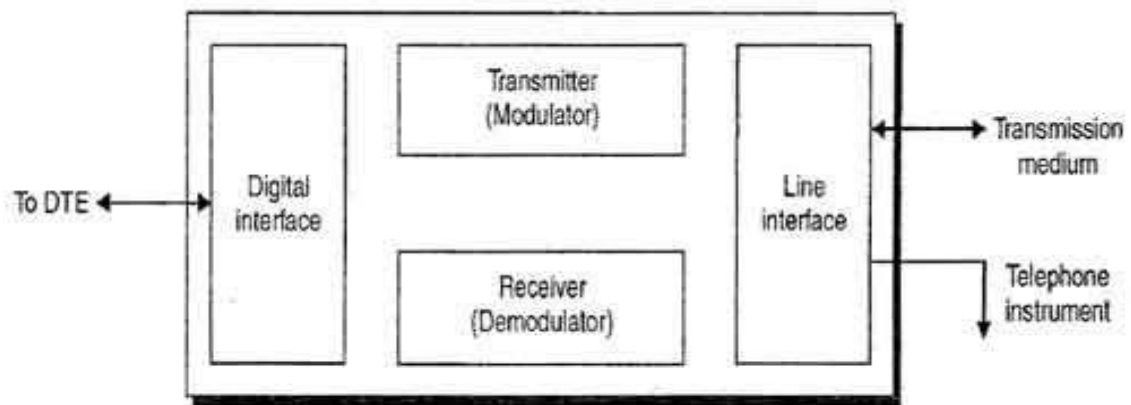
**Modulator** converts information from **digital mode to analog mode** at the transmitting end and demodulator converts the same from **analog to digital at receiving end**. The process of converting analog signals of one computer network into digital signals of another computer network so they can be processed by a receiving computer is **referred to as digitizing**.

When an analog facility is used for data communication between two digital devices called Data Terminal Equipment (DTE), modems are used at each end. DTE can be a terminal or a computer.





The modem at the transmitting end converts the digital signal generated by DTE into an analog signal by modulating a carrier. This modem at the receiving end demodulates the carrier and hand over the demodulated digital signal to the DTE.



Building blocks of a modem

The transmission medium between the two modems can be dedicated circuit or a switched telephone circuit. If a switched telephone circuit is used, then the modems are connected to the local telephone exchanges. Whenever data transmission is required connection between the modems is established through telephone exchanges.

## TYPES OF MODEMS

- Modems can be of several types and they can be categorized in a number of ways.

- Categorization is usually based on the following basic modem features:

1. Directional capacity: half duplex modem and full duplex modem.
2. Connection to the line: 2-wire modem and 4-wire modem.
3. Transmission mode: asynchronous modem and synchronous modem.

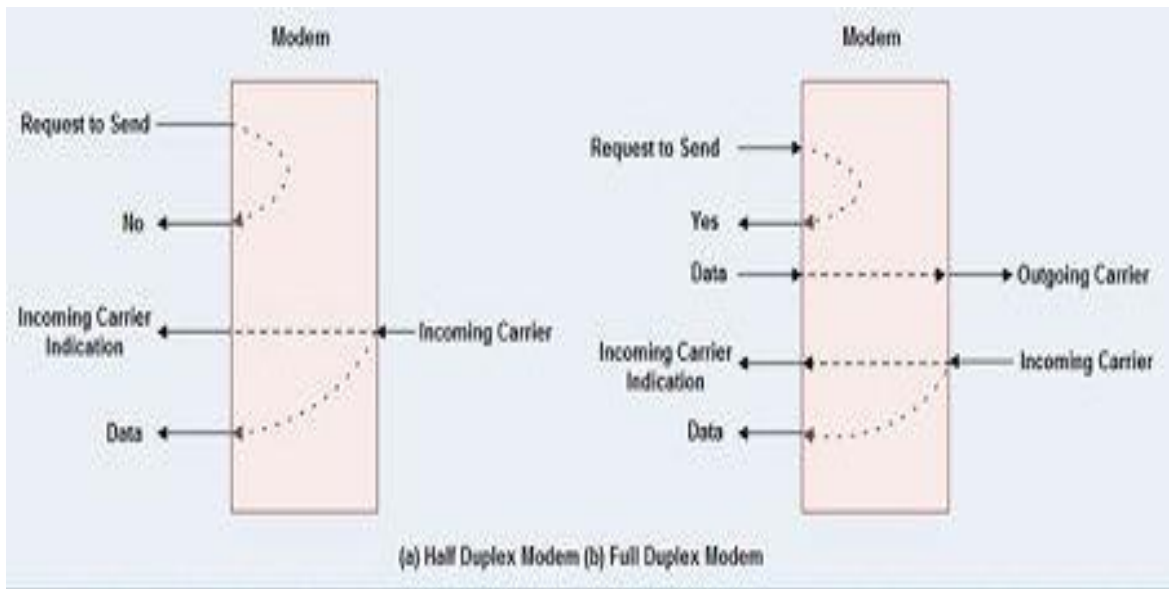
### Half duplex and full duplex Modems

#### Half duplex

1. A **half duplex modem** permits transmission in one direction at a time.

2. If a carrier is detected on the line by the modem, I gives an indication of the incoming carrier to the DTE through a control signal of its digital interface.

3. As long as they camel' IS being received; the modem does not give permission to the DTE to transmit data.



### Full duplex

- A **full duplex modem** allows simultaneous transmission in both directions.

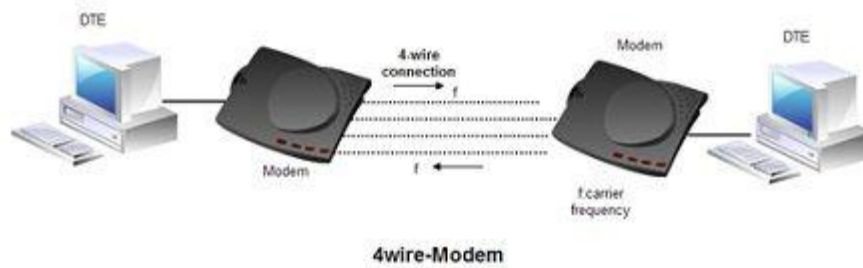
- Therefore, there are two carriers on the line, one outgoing and the other incoming. **Wire and 4-wire Modems**

- The line interface of the modem can have a 2-wire or a 4-wire connection to transmission medium. 4-wire Modem

- In a 4-wire connection, one pair of wires is used for the outgoing carrier and the other pair is used for incoming carrier.

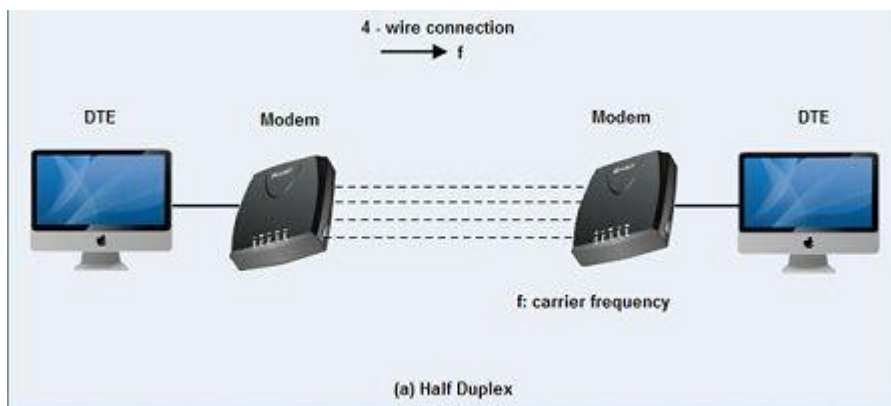
- Full duplex and half duplex modes of data transmission are possible on a 4- wire connection.

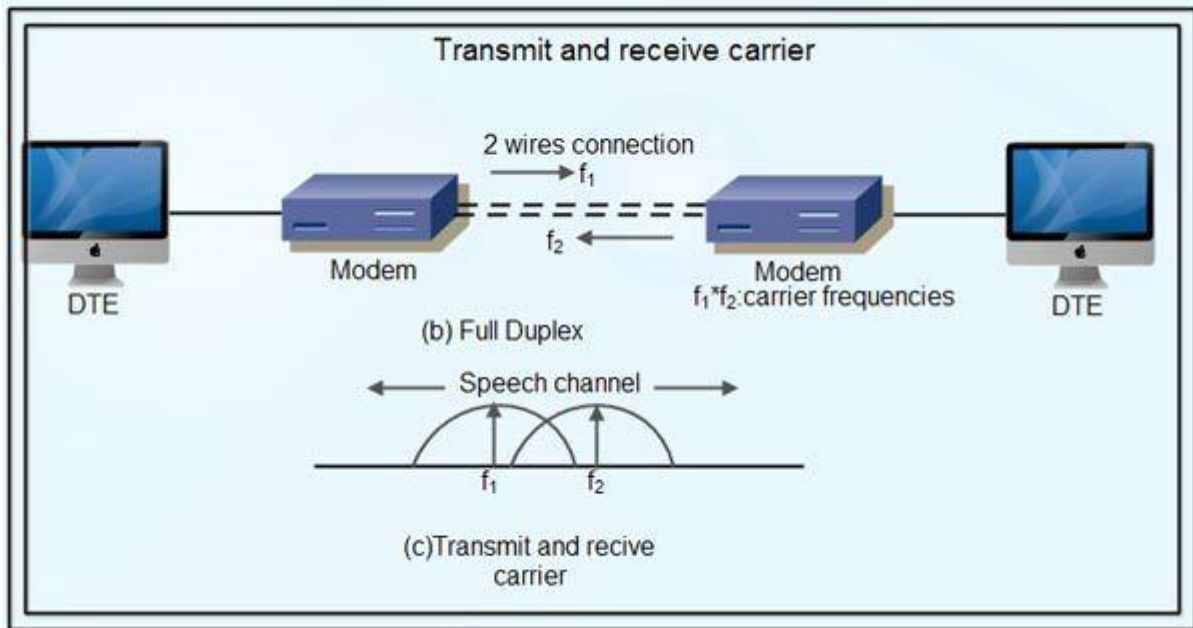
- As the physical transmission path for each direction is separate, the same carrier frequency can be used for both the directions.



## 2-wire Modem

- 2-wire modems use the same pair of wires for outgoing and incoming carriers.
- A leased 2-wire connection is usually cheaper than a 4-wire connection as only one pair of wires is extended to the subscriber's premises.
- The data connection established through telephone exchange is also a 2-wire connection.
- In 2-wire modems, half duplex mode of transmission that uses the same frequency for the incoming and outgoing carriers can be easily implemented.
- For full duplex mode of operation, it is necessary to have two transmission channels, one for transmit direction and the other for receive direction.
- This is achieved by frequency division multiplexing of two different carrier frequencies. These carriers are placed within the bandwidth of the speech channel.

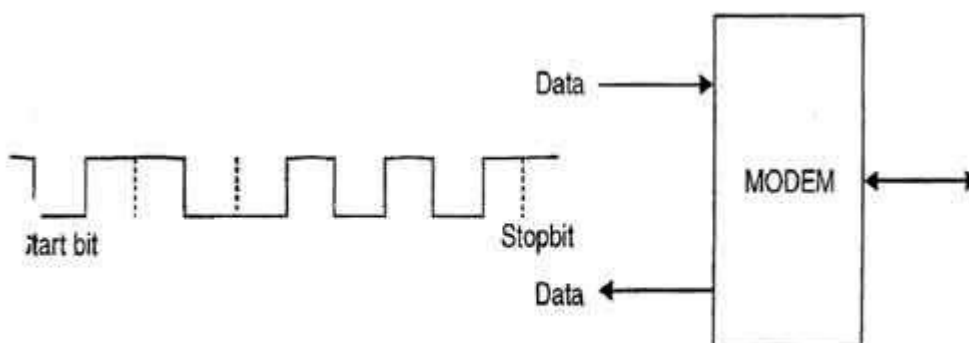




## Asynchronous & Synchronous Modems

### Asynchronous Modem

- Asynchronous modems can handle data bytes with start and stop bits.
- There is no separate timing signal or clock between the modem and the DTE.
- The internal timing pulses are synchronized repeatedly to the leading edge of the start pulse.

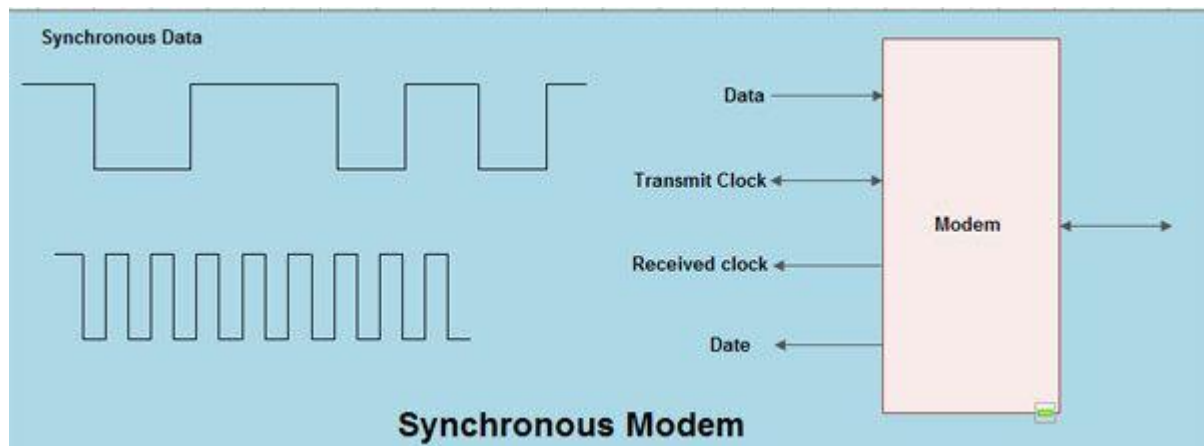


Asynchronous modem

### Synchronous Modem

- Synchronous modems can handle a continuous stream of data bits but requires a clock signal.
- The data bits are always synchronized to the clock signal.

- There are separate clocks for the data bits being transmitted and received.
- For synchronous transmission of data bits, the DTE can use its internal clock and supply the same to the modem.



Modulation techniques used for Modem:

The basic modulation techniques used by a modem to convert digital data to analog signals are :

- Amplitude shift keying (ASK).
- Frequency shift keying (FSK).
- Phase shift keying (PSK).
- Differential PSK (DPSK).

These techniques are known as the binary continuous wave (CW) modulation.

- Modems are always used in pairs. Any system whether simplex, half duplex or full duplex requires a modem at the transmitting as well as the receiving end.

- Thus a modem acts as the electronic bridge between two worlds - the world of purely digital signals and the established analog world

## UNIT VII CYBERTERRORISM



### 1. CYBERTERRORISM: DEFINITION, HISTORY, TYPES

Cybercrime is criminal activity that entails the use of a computer system, computer technology, or the internet.



## **TEXT 1 CYBERTERRORISM AS THE SIGNIFICANT THREAT**

Cyberterrorism has increasingly become one of the most significant threats nationally and internationally. Being that the internet makes it easier for terrorists to communicate, organize terrorist cells, share information, plan attacks; the internet also is used to cyber terrorist acts.

Since the September 11th terror attacks on the US, Americans have remained on high alert for possibly another terror attack. The government has many action plans ready in the event that they get wind of another attack or an attack happens. Law enforcement has received training in terrorism prevention and detection techniques, granted terrorists are always looking for ways to improve their methods of attack.

The use of computers and the internet have been an important part of our daily lives. Computers and the internet makes life easier because they can be used for “storing information, processing data, sending and receiving messages, communication, control machines, typing, editing, designing, drawing” and many other aspects of life. Businesses, government and different industries have all become accustomed to information technology. Their reliance on information technology creates lots of opportunities for terrorism. Being that computers play such a big role in our lives it stimulates criminals and terrorists to plan and create attacks. This is where cyberterrorism comes into play. There is a lot of misinterpretation of what the definition of cyberterrorism is and what is actually considered cyberterrorism.

Despite the substantial investment in technology and infrastructure, cyberterrorism is one of the major challenges when it comes to terrorism. "Terrorists can sit at one computer connected to one network and can create worldwide havoc."

## **What is Cyberterrorism?**

There are so many interpretation of the term cyberterrorism, but they all mean the same thing just different aspects of the terminology. The FBI's definition of cyber terrorism is "the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." (Krasavin ) The U.S. Department of State defines cyberterrorism as "premeditated politically motivated violence perpetrated against noncombatant targets by sub-national groups or clandestine agents." The U.S. National Infrastructure Protection Center defines it as a "criminal act perpetrated by the use of computers and telecommunication capabilities, resulting in violence destruction and/or disruption of services to create fear by causing confusion and uncertainty within a given population to conform to particular political, social or ideological uses cyber-attacks to take advantage and possibly causes harm or death."

## **The history of cyber terrorism**

"The history of cyber terrorism has already been established as a way of stealing money and shutting down important national systems. Cyber terrorism is an even greater issue today as more and more corporations are running their businesses online, and more people are willing to share information over the Internet." (Sizemore, 2007) Cyberterrorism doesn't date that far back because the use of the computers and the internet is relatively new. It was just in the past decades that cyber security threats has surface worldwide. "Obvious targets of cyber terrorism consist of critical infrastructure including transportation, electric power grids, oil and gas distribution, telecommunications, air traffic and financial institutions." (Olmstead and Siraj, 2009) Cyberterrorism has been around since the late 1980s, which the number of terrorist attack has increased since September 11th. There are several types of cyber terrorism activities which include email bombing, hacking into government portals, banking water and hospital websites to cause harm and endanger the lives of others. The cost of cleaning up after



attack not matter if its viruses or worm to malicious computer code to destroying all the data on a computer system can be very costly. “The worldwide cost reached \$17.1 billion in 2000, a 41 percent increase over the previous year, according to Computer Economics, an information technology research firm based in Carlsbad, California.”

### **Examples of Cyberterrorism**

Cyber-terrorism can be the use of computing assets to threaten or force others. There are so many examples of cyberterrorism some bigger than others. An example of cyberterrorism could be “hacking into a hospital computer system and changing someone's medicine prescription to a lethal dosage as an act of revenge.”

1996 - White Supremacist movement

An alleged White Supremacist movement computer hacker brought down Massachusetts Internet Service Provider (ISP) and destroyed a significant fraction of its record keeping system when the ISP had tried to stop him from using it to disseminate racist messages globally using its name. He left a message: “You have yet to see true electronic terrorism. This is a promise.”

1998 - Spanish protestors & Internet Black Tigers

The Institute for Global Communications (IGC) was flooded with thousands of spam email from Spanish protestors. It brought down the ISP's network causing a jam-up of all email on its network and all its users couldn't receive email. These users kept calling the ISP's support lines hogging these lines and creating problems for the ISP. The IGC staff and member accounts were also flooded and their Web pages were filled with fake credit card orders. The group of protestors also threatened to do the same to organizations which employ IGC's services as they wanted IGC to stop hosting the website of the Euskal Herrial Journal, a publication based in New York which supported Basque independence. As a section on the site contained information on the terrorist group ETA, which was responsible for assassinating Spanish political and security officials and

attacks on military installations, the protestors accused the IGC of supporting terrorism. In the end, IGC gave in and removed the site because it was flooded with too much email.

#### 1999 - Attack against NATO computers

NATO computers were flooded with email and hit with Denial of Service (DOS) attacks by hackers, who were activists, protesting the NATO bombings during the Kosovo conflicts. Businesses, public organizations and academic institutions reportedly received highly politicized emails filled with viruses from a host of European countries. When the US accidentally bombed the Chinese embassy in Belgrade, Chinese hactivists put up messages on US government websites stating "We won't stop attacking until the war stops!"

#### Levels of cyber terror capability

**Simple-Unstructured:** The capability to conduct basic hacks against individual systems using tools created by someone else. The organization possesses little target analysis, command and control or learning capability

**Advanced-Structured:** The capability to conduct more sophisticated attacks against multiple systems or networks and possibly, to modify or create basic hacking tools. The organization possesses an elementary target analysis capability and command and control structure for sequential attacks from a single location. Some learning ability - can assimilate some new technologies and train personnel.

**Complex-Coordinated:** The capability for coordinated attacks capable of causing mass-disruption. Ability to analyze vulnerabilities, penetrate integrated, heterogeneous defenses (including cryptography) and create attack tools. It has the strong ability to conduct target analysis and high confidence in results. Strong command and control structure capable of employing multiple, simultaneous attacks from different locations. Strong organizational learning capacity – can keep up with latest technology, train personnel, diffuse knowledge throughout the organization, and make necessary doctrinal and organizational changes to enhance capabilities

## Answer the questions



1. Explain what cyberterrorism is. cyberterrorism is.
2. Can a universal definition of cyberterrorism be created?  
Why do you think so?
3. Why is a definition of cyberterrorism important?
4. Cyberterrorist attacks have three key components: Motive, Intent, and Target. What are these motives, intent, and targets?
5. Has a case met all the requirements to be an act of cyberterrorism happened? Why or why not?
6. How can cyberterrorism be combated?
7. Who is a hacktivist?
8. Describe some ways that cyberwarfare differs from general cyberterrorism.

## 2. CYBERCRIME

*Read different definitions of cybercrime. Three of these definitions come from official bodies, agencies or institutions. There are a few of the typical features of formal language:*

A. Any criminal act that has to do with computers and networks; it also includes traditional crimes conducted through the Internet.

B. Any crime that is committed using a computer network or a hardware device.

C. Sophisticated attacks against computer hardware and software.

D. Any crime that involves a computer and a network.

E. Criminal acts that are committed online by using electronic communications networks and information systems.

F. Crimes which are directed at computers or other devices (for example, hacking), and where computers or other devices are integral to the offence.

G. Using a computer as an instrument for illegal ends, such as committing fraud, trafficking in child pornography and/or intellectual property, stealing people's identity, or violating privacy.

H. The violation of laws involving a computer or a network.

*Exercise 1. Choose the definition of cybercrime that you agree most with (A-H).*

*Exercise 2. Give one reason for each of the other definitions that has made you decide they are not the best.*

## **LEGAL ‘DEFINITIONS’ OF CYBERCRIME**

*Read the text below and decide if the statements below (1-5) are true or false (T/F) with reference to the text. Pay attention to ‘definitions’ of cybercrime which depend on the aim of using the term.*

A limited number of acts against the confidentiality, integrity and availability of computer data or systems represent the core of cybercrime. Beyond this, however, computer-related acts for personal or financial gain or harm, including forms of identity-related crime, and computer content-related acts (all of which fall within a wider meaning of the term ‘cybercrime’) do not lend themselves easily to efforts to arrive at legal definitions of the aggregate term. However, a ‘definition’ of cybercrime is not as relevant for other purposes, such as defining the scope of specialised investigative and international cooperation powers, which are better focused on electronic evidence for any crime, rather than a broad, artificial ‘cybercrime’ construct.

### **Statements:**



harm. T/F

1. The core of cybercrimes refers to a list of expressly defined crimes. T/F
2. Computer-related acts only fall within the scope of cybercrime if they result in causing personal harm. T/F
3. It is quite difficult to define acts that constitute cybercrimes. T/F

4. Without defining the individual cybercrimes precisely the scope of investigative powers cannot be specified. T/F

5. The core focus of the investigative and international cooperation powers is discovery of specific evidence of any criminal offence as such. T/F

***Read the text below which has been taken from the EUROPOL website and fill the gaps necessary form of the verb provided in square brackets. Look for clues in the text to help you decide which tense to use. Remember to check if the form should be an active verb (such as generate) or a passive one (is/are generated). Please note that alternative verb forms are provided in parentheses.***

Cybercrime is an EMPACT10 priority for the policy cycle from 2013 to 2017: the aim is to combat cybercrimes that (A) *are committed (have been committed)* [**commit**] by organised crime groups and that (B) \_\_\_\_\_ [**generate**] large profits from such activities as online and payment card fraud, cybercrimes that cause serious harm to their victims such as child sexual exploitation, and cyberattacks, which (C) \_\_\_\_\_ [**affect**] critical infrastructure and information systems in the EU.

Technical innovation (D) can \_\_\_\_\_ [**harness**] for social good, but just as readily for nefarious11 ends. This is truer of cybercrime than of perhaps any other crime area. And cybercriminals (E) \_\_\_\_\_ [**get, also**] more aggressive. That's why Europol and its partner organisations (F) \_\_\_\_\_ [**take**] the fight to them on all fronts.

According to the most recent Internet Organised Crime Threat Assessment (IOCTA), cybercrime (G) \_\_\_\_\_ [**become**] more aggressive and confrontational. This (H) can \_\_\_\_\_ [**see**]

across the various forms of cybercrime, including high-tech crimes, data breaches and sexual extortion.

Cybercrime is a growing problem for countries, such as EU Member States, in most of which internet infrastructure is well developed and payment systems are online. But it is not just financial data, but data more generally, that is a key target for cybercriminals. The number and frequency of data breaches are on the rise, and this in turn (I) \_\_\_\_\_ [*lead*] to more cases of fraud and extortion.

The sheer range of opportunities that cybercriminals (J) \_\_\_\_\_ [*seek*] to exploit is impressive. These crimes include:

- using botnets—networks of devices infected with malware without their users' knowledge— to transmit viruses that (K) \_\_\_\_\_ [*gain*] illicit remote control of the devices, steal passwords and disable antivirus protection;

- creating “back doors” on compromised devices to allow the theft of money and data, or remote access to the devices to create botnets;

- creating online fora to trade hacking expertise;

- bulletproof hosting and creating counter-anti-virus services;

- laundering traditional and virtual currencies;

committing online fraud, such as through online payment systems, carding and social engineering;

- various forms of online child sexual exploitation, including the distribution online of child sex-abuse materials and the live-streaming of child sexual abuse

- the online hosting of operations involving the sale of weapons, false passports, counterfeit and cloned credit cards, and drugs, and hacking services.

## High-tech crimes

Malware, or malicious software, (L) \_\_\_\_\_ [*infiltrate*] and (M) \_\_\_\_\_ [*gain*] control over a computer system or a mobile device to steal valuable information or damage data. There are many types of malware, and they (N) *can* \_\_\_\_\_ [*complement*] each other when performing an attack.

*Reread the text in part a) and look at the underlined words. Do you understand their meanings? Are the meanings already provided in the text? If not, look them up.*

### EXERCISES

#### TEST

<p>1. What are some common forms of cyber crime?</p> <p>2. Describe a computer as an instrument of crime.</p> <p>3. Obscenity Online: Cyber Bullying: Trends, offender/victim details</p> <p>4. Describe a computer as incidental to a crime.</p> <p>5. What is a honeypot and what is it used for?</p> <p>6. Crimes associated with the prevalence of computers</p> <p>7. What is a honeynet and what is it used for?</p>	<p><b>A.</b> easier to bully, make bullying more open to other people, no physical torment only mental/verbal</p> <p><b>B.</b> use of a computer to carry out illegal action. i.e. vandalism, DoD attacks,</p> <p><b>C.</b> fake computers/servers set up as a decoy with vulnerabilities to deter cyber intruders from getting to real system, these are then used to study the actions of intruders to prevent future occurrences. - this study can then be disseminated to other organizations to help protect their infrastructure</p> <p><b>D.</b> These types of crimes are occurring as a result of modern advancements of technology and widespread use of computers.</p> <p><b>E.</b> theft, fraud, destruction of data files, extortion, gambling, stalking, pornography,</p> <p><b>F.</b> multiple honeypots linked together to form one large decoy network. - seeks to raise awareness of threats and vulnerabilities, educate and inform security professionals</p> <p><b>G.</b> not primary instrument of crime, but facilitates it, such as money laundering</p>
--	--



*7 вопросов для подбора*

1.
2.
3.
4.
5.
6.
7.

*7 вопросов с выбором ответа*

1. computer or its data is the target of the crime
  1.  Describe a computer as incidental to a crime.
  2.  What is the "Silk Road"?
  3.  white collar crime
  4.  Computer as a target
2. mostly directed towards committing cyber crimes with the intention of aiding a terrorist organization. also using technology to communicate with terrorists
  1.  Computer as a target
  2.  Cyberterrorism
  3.  white collar crime
  4.  Obscenity Online: Sex tourism:
3. Makes stalking easier, can spread slander about victim to many people. can stalk them virtually, steal personal info and find new addresses or phone numbers. may set up webpage dedicated to victim
  1.  Obscenity Online: Cyber Bullying: Trends, offender/victim details
  2.  Crimes associated with the prevalence of computers
  3.  Obscenity Online: Cyberstalking: how has the internet changed stalking?

4.  Obscenity Online: Sex tourism:
  4. issues- no single policy plan for computer investigations
    1.  What is a honeynet and what is its appliance?
    2.  What is the issue of current computer investigations?
    3.  What is the "Silk Road"?
    4.  What is the USA PATRIOT Act?
  5. online drug, firearms, and illegal merchandise trading
    1.  What is the USA PATRIOT Act?
    2.  What are some common forms of cyber crime?
    3.  Computer as a target
    4.  What is the "Silk Road"?
  6. - self-proclaimed civil rights group that believes in relationships between men and boys
    1.  Obscenity: NAMBLA:
    2.  Role of the 4th Amendment in cyber realm.
    3.  How can Honeypots/Honeynets help law enforcement
    4.  Who is the biggest player in economic computer crimes against businesses?
  7. They can understand how hacker access certain things and create a guardian in response
    1.  Role of the 4th Amendment in cyber realm.
    2.  Who is the biggest player in economic computer crimes against businesses?
    3.  What are some common forms of cyber crime?
    4.  How can Honeypots/Honeynets help law enforcement
-



*6 вопросов "верно-неверно"*

- . - pen/trace- Electronic Communications Privacy Act (ECPA): regs how gov't can obtain info from ISPs
  - . - computer fraud and abuse act 1984- focuses on unauthorized access to computers
3. - Economics Espionage act- impose criminal penalties on theft of trade secrets
  4. - family entertainment and copyright act- increases penalties attached to acts of piracy → What are some common forms of cyber crime?
    - Верно  Неверно
  5. employees of victimized companies → How can Honeypots/Honeynets help law enforcement
    - Верно  Неверно
  6. 1/2 are children. online can have forums or hidden vacation package deals for sex tourism in places like southeast Asia. → Obscenity Online: Sex tourism:
    - Верно  Неверно
  7. Term coined by Edwin Sutherland
  8. A crime committed by a person high social status in the course of his work.
  9. Has to happen during one's occupation. → What is the USA PATRIOT Act?
    - Верно  Неверно
  10. Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism
  - 11.- after 9/11 expanded use of surveillance tools: wiretaps, search warrants, pen/trap and trace orders, court orders.
  - 12.- new revisions sought to backup constitutional rights → What is the "Silk Road"?
    - Верно  Неверно

13. right against unreasonable search and seizure, unless probable cause is present;  
best way to protect yourself is a warrant.

14.- search warrant: to get --> crime has occurred, evidence exists, exclusionary rule- evidence collected without warrant cannot be used in court of law, inevitable discovery doctrine- normal police investigation would have discovered the evidence and can now be used in court → How can Honeypots/Honeynets help law enforcement

Верно  Неверно

### 3.ABBREVIATIONS OF CYBERSPACE



CERT Computer Emergency Response Team

CSIRT Computer Security Incident Response Team

ECHR European Convention for the Protection of Human Rights and  
Fundamental Freedoms

ECtHR European Court of Human Rights

EU European Union

EUROPOL European Police Office

G8 Group of Eight

GDP Gross domestic product

HDI Human Development Index

ICCPR International Covenant on Civil and Political Rights

ICCPR-OP2 Second Optional Protocol

to the International Covenant on Civil and Political Rights, aiming at the  
abolition of the death penalty

ICERD International Convention on the Elimination of All Forms  
of Racial Discrimination

ICESCR International Covenant on Economic, Social and Cultural Rights

ICRMW United Nations International Convention on the Protection of the  
Rights of All Migrant Workers and Members of Their Families

ICT Information and communications technology

INTERPOL International Criminal Police Organization

IP Internet protocol

ISP Internet service provider

IT Information technology

ITU International Telecommunication Union

NFC Near field communication

P2P Peer-to-peer

SCO Shanghai Cooperation Organisation

SMS Short message service

UNESCO United Nations Educational, Scientific and Cultural  
Organization

UNODC United Nations Office on Drugs and Crime

UNSC United Nations Security Council

URL Uniform Resource Locator

USB Universal serial bus

VGT Virtual global taskforce

WEF World Economic Forum

***Ex. 1 Look at the examples above and try to complete the missing words  
or letters (small spaces) in parentheses. Translate them.***

1. AS (A \_ \_ \_ \_ s Server)

2. ATM (A \_\_\_\_\_ T \_\_\_\_\_ Machine)

3. BT (B \_ \_ \_ \_ \_ th)

4. BW (Band \_ \_ \_ \_ \_)

5. CERT (Computer E \_\_\_\_\_ R \_\_\_\_\_ Team)

6. CNP Transaction (C \_ \_ \_ Not Present Transaction)

7. CPS (C \_\_\_\_\_ s per Second)

8. CSP (C \_ \_ \_ \_ Service Provider)

9. CSV (C \_ \_ \_ \_ -separated values)

10. DBMS (D \_ \_ \_ \_ \_ e M \_\_\_\_\_ ment System)

11. DL (D \_ \_ \_ \_ \_ ad)

12. DNS (D \_ \_ \_ \_ n Name System)

13. EFS (En \_ \_ \_ \_ \_ ing File System)

15. FAQs (F \_\_\_\_\_ A \_\_\_\_\_ Q \_\_\_\_\_)

15. FxP (F \_ \_ \_ Exchange P \_ \_ \_ \_ \_ ol)
16. GB (\_\_\_\_\_)
17. IP (I\_\_\_\_\_ Protocol)
18. IS (I\_\_\_\_\_ Systems)
19. ISP (I\_\_\_\_\_ S\_\_\_\_\_ Provider)
20. IT (I\_\_\_\_\_ T\_\_\_\_\_)
21. LCD (L \_ \_ \_ \_ d C \_ \_ \_ \_ \_ Display)
22. MB (\_\_\_\_\_)
23. MS (M \_ \_ \_ \_ \_ Stick)
24. NFS (Network F \_ \_ \_ \_ System)
25. ODBC (O \_ \_ \_ D \_ \_ \_ \_ \_ se Connectivity)
26. OLTP (Online T \_\_\_\_\_ n Processing)
27. OS (O \_\_\_\_\_ System)
28. PDF (P \_ \_ \_ \_ \_ le D \_ \_ \_ \_ \_ nt Format)
29. RAS (R \_ \_ \_ \_ \_ A \_ \_ \_ \_ \_ Service)
30. RAM (R \_ \_ \_ \_ \_ m A \_ \_ \_ \_ \_ Memory)
31. RAT (R \_ \_ \_ \_ \_ e Administration T \_ \_ \_ l)
32. RC (R \_ \_ \_ \_ \_ n Code)
33. ROM (R \_ \_ \_ \_ O \_ \_ \_ \_ Memory)
34. SMTP (S \_ \_ \_ \_ \_ Mail T \_ \_ \_ \_ \_ r Protocol)
35. SSD (Software Spe \_\_\_\_\_ Document)
36. TB (\_\_\_\_\_)
37. URL (U \_\_\_\_\_ Resource L \_ \_ \_ \_ \_ tor)
38. VGA (Video Graphics Adapter)
39. VR (V \_\_\_\_\_ Reality)
40. WAN (W \_ \_ \_ \_ Area N \_ \_ \_ \_ \_ k)
41. WAP (W \_\_\_\_\_ Access P \_\_\_\_\_)
42. WiFi (W \_\_\_\_\_ F \_ \_ \_ \_ \_ \_ y)
43. WLAN (W \_\_\_\_\_ L \_ \_ \_ \_ Area N \_\_\_\_\_)
44. WWW (\_\_\_\_\_)

**Ex.2** *In the following activities you will review your knowledge of acronyms and abbreviations used in IOCTA, organizations and authorities, and telecommunications. Write the letter next to the abbreviation.*

**a) PART I: IOCTA general abbreviations**

1 APT	a) Internet service provider
2 APWG	b) European Money Mule Actions
3 AVC	c) Crime Abuse Material
4 CaaS	d) European Malware Analysis System
5 CAM	e) Critical Infrastructure
6 CI	f) Advanced Persistent Threat
7 CVV	g) Domain Name System
8 DNS	h) Card Verification Value
9 EMAS	i) Crime-as-a-Service
10 EMMA	j) Anti-Phishing Working Group
11 IIP	k) Internet Protocol
12 ISP	l) Automated Vending Card
13 IP	m) Organised crime group
14 OCG	n) Invisible Internet Project

**b) PART II: Organizations and authorities**

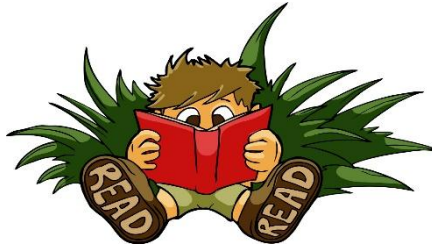
1 CERT	a) European Cybercrime Centre
2 J-CAT	b) Serious and Organised Crime Threat Assessment
3 ENISA	c) Supervisory control and data acquisition systems
4 EC3	d) European Union Agency for Network and Information Security
5 EAST	
6 SCADA	e) Computer emergency response team



7 SIENA	f) Society for Worldwide Interbank Financial
8 SOCTA	g) Computer Security Incident Response Team
9 SWIFT	h) Secure Information Exchange Network Application
10 CSIRT	i) European Association for Secure Transactions
	j) Joint Cybercrime Action Taskforce

**c) PART III: Telecommunications**

1 THB	a) Transaction Authentication Number
2 Tor	b) Trafficking in human beings
3 URL	c) The Onion Router
4 TAN	d) Virtual private network
5 VoIP	e) Uniform resource locator
6 VPN	f) Voice-over-Internet Protocol



## 4.SUPPLEMENTARY READING

### Introduction to crime prevention

‘Crime prevention’ refers to the strategies and measures that seek to reduce the *risk* of crimes occurring, and their harmful effects on society and persons, through interventions that influence the multiple causes of crime. The US Guidelines for the Prevention of Crime highlight that government leadership plays an important role in crime prevention, combined with cooperation and partnerships across ministries and between non-governmental organizations, authorities, the business sector, community organizations and private citizens.

Crime prevention practice begins with basic *principles* (such as leadership, cooperation, and the rule of law), suggests forms of *organization* (such as crime prevention plans), and leads to the implementation of *methods* (such as development of a sound knowledge base) and *approaches* (including reducing criminal opportunities and target hardening).

Cyber crime presents particular challenges of crime prevention. These include the increasing ubiquity and affordability of online devices leading to large numbers of potential victims; the comparative willingness of persons to assume ‘risky’ online behaviour; the possibility for anonymity and obfuscation techniques on the part of perpetrators; the transnational nature of many cyber crime acts; and the fast pace of criminal innovation. Each of these challenges

has implications for the *organization*, *methods* and *approaches* adopted for prevention of cyber crime.

*Methods* will need to ensure a constantly updated picture of cyber threats, and *approaches* will need to involve a range of stakeholders – in particular the private sector organizations that own and operate internet infrastructure and services.

1. Найдите в тексте и выпишите из него предложения, демонстрирующие те или иные изученные вами грамматические явления (видо-временные формы глагола, неличные формы глагола, модальность, нестандартные случаи употребления множественного числа, степени сравнения, типы предложений). Подчеркните эти явления и дайте перевод этих предложений.

2. Выпишите из текста 10 незнакомых слов и выражений и составьте с ними предложения в различных видо-временных формах и в разных типах предложений (утвердительной, отрицательной, вопросительной).

3. Сформулируйте 10 специальных вопросов, раскрывающих основное содержание.

4. Напишите аннотацию и выразите своё отношение к прочитанному.

### **Prevention of Cyberterrorism**

According to the Info Security there are several ways to prevent cyberterrorism. Listed below is what Info Security felt were the best way to prevent cyberterrorism:

-having highly trained internationally certified, experienced security professional that analyze the problem

-policies, practices, tests, hardware, software, literature, training and education is designed to protect against cyber attacks

-Implementing strong access control systems to ensure that only authorized individuals can access cyber systems

-Using strong encryption to ensure confidentiality and integrity of information stored, processed, and transmitted on and through cyberspace

-Closely monitoring all cyber activity by using log files and log analyzers

-Keeping policies up to date, and ensuring they are strictly enforced

-Implementing effective detection systems to recognize cyber-attacks quickly

-Appointing active cyber security leadership to implement a real-time national defense strategy

1. Найдите в тексте и выпишите из него предложения, демонстрирующие те или иные изученные вами грамматические явления (видо-временные формы глагола, неличные формы глагола, модальность, нестандартные случаи употребления множественного числа, степени сравнения, типы предложений). Подчеркните эти явления и дайте перевод этих предложений.

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4. Напишите аннотацию и выразите своё отношение к прочитанному.

### **Cybercrime strategies**

Many countries framed responses related to *prevention of cyber-crime* within the overall context of the need for a national cyber-crime *strategy*. In its turn, a lot of countries also highlighted the strong links between *cyber-crime* and *cyber-security* strategies.

Countries referred to all of ‘cyber’ strategies, ‘cyber-security’ strategies, ‘information security’ strategies, ‘cyber-space’ strategies, and ‘cyber-crime’ strategies when asked about the existence of a national strategy (or equivalent)

‘for cybercrime’,<sup>10</sup> This range of responses highlights the increasing interdependence of citizen security and vulnerability to cyber-crime, and the security of national computer infrastructure, as well as that of transnational corporations. While significant overlap exists between cyber crime and cyber security approaches, the two fields nonetheless also have some differences.

Rather it seeks to reflect information provided through the Study questionnaire, encompassing all strategy types reported.

Overall, around 30 per cent of responding countries indicated the existence

of a national cybercrime strategy. Depending upon the region, a further 20 to 50 per cent of countries reported that such a strategy was under preparation. Countries in Africa, Asia and Oceania reported the lowest levels of cybercrime strategies – with 50 per cent or more of countries indicating that such an instrument did not exist.

Cyber-crime strategies are important for ensuring that national law enforcement and criminal justice responses fully take into account both the challenges of cyber-crime, as well as electronic evidence components of all crimes.

The development of a cyber crime strategy represents a critical first step in determining operational and strategic priorities before engagement in processes such as legislative reform.

As evidenced by the range of country responses, cyber crime strategies may be prepared as ‘stand-alone’ documents, or integrated as cyber security strategies components.

1. Найдите в тексте и выпишите из него предложения, демонстрирующие те или иные изученные вами грамматические явления (видо-временные формы глагола, неличные формы глагола, модальность, нестандартные случаи употребления множественного числа, степени сравнения, типы предложений). Подчеркните эти явления и дайте перевод этих предложений.

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33.Professional English: Computer Technologies: навч. посіб. / О. М. Акмалдінова, О. Є. Бугайов, Г. В. Бабій, С. А. Волгіна. — К.: НАУ, 2014. — 352 с.

34.What Is a Modem in Computer Networking? Dial-up modems gave way to high-speed broadband modems / by Bradley Mitchell Updated on January 09, 2020 URL:<https://www.lifewire.com/what-is-a-modem-817861> (дата обращения: 20.05.2020).

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36.What is microcomputer?  
<https://internetofthingsagenda.techtarget.com/definition/microcomputer>

**Тестовые задания для самоконтроля**  
по специальности  
10.05.05 Безопасность информационных технологий в  
правоохранительной сфере



*Компьютерные системы*

**1 The two essential types of computers are ... and digital**

analog

hybrid

physical

accounting

**2. Digital computers count rather than .....**

measure

numbers

quantities

write

**3. Many industrial, business and scientific computer applications depend on the combination of analog and ..... devices.**

digital

hybrid

communications

engine

*Этапы создания компьютера*

1 The next main ..... in the computing origin was the invention of the transistor in 1947.

step

level

class

stage

2. The first high level general purpose programming ....., FORTRAN, was also being developed around this time.

language

word

phrase

level

3. Her brother said he ..... never .....that film before.

had seen

has seen

have seen

saw

*Цифровые компьютеры*

1. Data as well as instructions must flow into and out of...

second storage

primary storage

outputting

electromechanical

2. Computer memory must retain very large numbers of ..... .

bipolar semiconductor

symbol combinations

field-effect transistor

codes

3. Data are stored in ..... codes in primary as well as in secondary storage.

numerical

digital

code

binary

### *Персональные компьютеры*

1. Perhaps one of the most distinguishing feature of a personal computer is that it is used by an .....

students

person

people

individual

2 PC enjoy great popularity among experimenters and ....

persons

people

individual

hobbyists

3. Personal computers have a lot of .....

applications

binary

numerical

digital

### *Применение персональных компьютеров*

1. We live ... Moscow.

in

at

on

by

2. I get up ... seven o'clock and leave ... eight

at

from

by

during

3. There are three rooms ... our flat

to

in

during

from

*Modem*

1. Fax Modem can be hooked up to a phone and used to send information

to .....

user

person

producer

your computer

2. External Modem attaches to the back of the computer

by means of a cable that plugs into the .....

mouse

scanner

keyboard

3. Internal Modem is a board which plugs into the expansion slots of .....

hard

fixed

floppy

the computer

**ВОПРОСЫ** к экзамену

по дисциплине «Иностранный язык»

специальность 10.05.05 Безопасность информационных технологий в  
правоохранительной сфере

1. Could you introduce yourself?
2. How old are you?
3. Where was you born?
4. Where are your family (parents, sisters, brothers) now?
5. Are you a cadet of the Krasnodar University of the Ministry of Interior?
6. What is your future profession?
7. What problems are you to handle in your future work?
8. Is your future profession difficult?
9. Are the trainees to wear a special uniform?
10. What professional skills and abilities are you to get at the KU?
11. Who is to study many different subjects?
12. What are these subjects?
13. What foreign languages and special subjects do you study here?
14. What is the final object of your training at the KU?
15. Where is your Law University situated?
16. What is the territory of your institute?
17. How many years do you study at the KU?
18. What teachers and professors do you have here?
19. How many faculties are there at the KU?
20. Are there many lecture-halls, classrooms and special laboratories at your institute?
21. How are they equipped?
22. What helps our cadets to become skilled and well-trained militia officer?



23. Doyou know the capital of Scotland?
24. What do you know about the capital of Wales?
25. What is the main city of Northern Ireland?
26. How is the British flag named?
27. What is the financial center of London?
28. Where are the famous parks and historical places of London situated?
29. What part of London is port?
30. What is the Queen's residence in London?
31. Where are the important Government offices situated?
32. What part of London is mostly for work, not for living?
33. What is the order of the Tower's functions?
34. What is the Tower now?
35. Who are "the Beefeaters"?
36. What happens in the Tower at 10 p.m.?
37. Where is the residence of the British Prime Minister?
38. What is the main Queen's residence?
39. What is Westminster Abbey famous for?
40. Where is Poets' Corner?
41. What is Poets' Corner?
42. What does the British Parliament consist of?
43. How often are British Parliamentary elections held?
44. What is national English sport?
45. What game is not of British origin?
46. What do Americans mark on July 4?
47. In what century was the Civil War between the American states?
48. Between what states of America was the Civil War?
49. How many states is the USA composed of?
50. Name the most popular summer sport in the USA?
51. What are British Isles formed of?
52. Where are they situated?

53. What parts is the United Kingdom composed of?
54. What seas are the British Isles washed by?
55. What are the biggest rivers in Great Britain?
56. The climate of the country is rather mild, isn't it?
57. Where are the centres of textile industry situated?
58. Do you know any big industrial centres in Great Britain? What are they?
59. Is Liverpool the biggest port in Great Britain?
60. What is the population of the country?
61. Do you know any famous English writers, poets, scientists and painters?
62. What is the City of London famous for?
63. Why is London attractive for tourists?
64. There are four parts in London, aren't there?
65. What sights of London do you know?
66. Is the East End associated with the rich?
67. What are the most well-known streets in London?
68. Where is the United States of America situated?
69. What is the area and the population of the USA?
70. Which countries does the USA border upon?
71. What are the biggest rivers and largest lakes of the United States?
72. The highest mountain chains?
73. Which branches of heavy industry and light industry are highly developed in the United States?
74. What can one say about the capital of the USA?
75. What are forms of sports in America?
76. Which kinds of sports are the most popular in America?
77. Why is the United States often described as a nation on wheels?
78. What national holidays are established in most states of the USA?
79. Can you correct mistakes while typing any material and how?

80. Do you enjoy computer games?
81. How can computers be used in education?
82. Is it necessary for a person to be an analyst or a programmer to play computer games?
83. What are the main spheres of PC application?
84. What is "a word processing program"?
85. What other changes in the typed text can you make using a display?
86. What other home and hobby applications, except computer games, can you name?
87. What possibilities can it give you?
88. Which professions are in great need of computers?
89. What is a computer virus?
90. How many types of viruses are there? What are they?
91. How many groups of file-Infector do you know?
92. What do companion viruses do?
93. What don't viruses do?
94. What do special feature of POS path-companion viruses use?
95. Computer viruses do spontaneously generate, don't they?
96. What viruses will erase your entire hard disk?
97. How are viruses divided?
98. Viruses don't necessarily let you know that they are there-even after they do something destructive, do they?
99. What was the very first calculating device?
100. When did the first Calculating machine appear?
101. Can you imagine modern life without electronics?
102. How did electromechanical machines appear and what were they used for?
103. How were those electromechanical machines called and why?
104. What advantages did the transistor have over the vacuum tubes?
105. What aim was realized with the invention of the transistor?

106. What are instructions?
107. What are the basic structures of pseudocode?
108. What are the main techniques for planning the program logic?
109. What do you understand by “pseudocode”?
110. What is a program?
111. What is a template and what is it used for?
112. What is electronics?
113. What is programming?
114. What is the essence of programming?
115. How can you explain the term security?
116. What does the word “transistor” mean?
117. What kind of computers appeared later?
118. What made the progress in radio communication technology possible?
119. What should be done with the problem before processing by the computer?
120. What was the beginning of electronics development?
121. When was the transistor invented?
122. Where are electronic devices used?
123. Which are the major technical areas of computer security?
124. What do confidentiality, integrity, and authentication mean in terms of PC security?
125. What is nonrepudiation?
126. What disciplines does the term concern?
127. What is the most important aspect of computer security nowadays?
128. What is protected while surfing the Internet?
129. What does “ a computer-literate person” mean?
130. Are you aware of the potential of computers to influence your life?
131. Do you know where the instructions and digits are stored?
132. Give the examples of using computers in everyday life.
133. Prove that we all are on the way to becoming computer-literate.

134. What are the main advantages of computers?
135. What capabilities should data-processing systems combine when designed?
136. What do the people mean by “the basics”?
137. What do you know of computers accuracy?
138. What is the meaning of the word“computing”
139. What does a program mean?
140. What computer roles do you know in our society?
141. Give examples of a data communication network.
142. How can we respond to the challenges and opportunities of our post-industrial society?
143. Name the most usually used circuits in a computer?
144. What do you understand by capacity storage?
145. What is an important objective in the design of computer data processing systems?
146. What is the function of communication networks?
147. What is the most effective computer data processing system?
148. What kind of a system is a digital computer?
149. What other values of computer data processing systems do you know?

## English-English GLOSSARY of Cyber-Terms

Here is a list of some of the most important terms in the field of cybercrime. Some of the terms already dealt with in the exercises for each unit have been excluded from this list so as not to duplicate entries.

For each term, the Standard British English pronunciation definition and an example of usage are provided, as well as, where applicable, the sources of such definitions and examples.

Glossary by M. A. Campos Pardillos.

### **0-day (zero-day) attack** ('zɪərəʊ 'deɪ ə'tæk)

an attack which exploits a previously unknown vulnerability in software.  
(2015 NTT Group Global Threat Intelligence Report)

Example: *DEATH by PowerPoint: Microsoft warns of 0-day attack hidden in slides.* ([http://www.theregister.co.uk/2014/10/22/powerpoint\\_attacks\\_exploit\\_ms\\_0day/](http://www.theregister.co.uk/2014/10/22/powerpoint_attacks_exploit_ms_0day/))

### **adware** ('æd,wɛə)

[type of software that ] collects information about an Internet user in order to display advertisements in the user's Web browser based upon information it collects from the user's browsing patterns. (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf>)

Example: *According to the plea agreement, MAXWELL and two unnamed co-conspirators created the botnet to fraudulently obtain commission income from installing adware on computers without the owners' permission.* (<https://www.justice.gov/archive/criminal/cybercrime/press-releases/2006/maxwellPlea.htm>)

**APT (Advanced Persistent Threat)** (æd'vɑ:nst pə'sistənt 'θret)

An attacker with long-term goals who is highly skilled and well-funded, generally by a government or by organized crime. An APT is usually a complex attack using multiple techniques for maximum benefit.

(2015 NTT Group Global Threat Intelligence Report)

Example: *The most challenging part of Advanced Persistent Threat Attacks is to exfiltrate the collected data because; this has to be transported out of the network in to the attacker's server.* (<http://resources.infosecinstitute.com/advanced-persistent-threats-attack-and-defense/>)

**ATM** ('ei 'ti: 'em)

Automatic Teller Machine.

Example: *Through the use of specially designed malware, attackers no longer need to use traditional safe cracking methods to empty an ATM's money safe.* ([https://www.europol.europa.eu/latest\\_news/europol-and-trend-micro-release-comprehensive-overview-atm-malware-threat](https://www.europol.europa.eu/latest_news/europol-and-trend-micro-release-comprehensive-overview-atm-malware-threat))

**back door** ('bæk'dɔ:)

Secret (undocumented), hard-coded access codes or procedures for accessing information. Some back doors exist in commercially-provided software packages; e.g., consistent (canonical) passwords for third-party software accounts. Alternatively, back doors can be inserted into an existing program or system to provide unauthorized access later. (<http://www.mekabay.com/overviews/glossary.pdf>)

Example: *In some cases, the victim learned that personal and financial information had also been removed from their computer via the back door.*

(<https://archives.fbi.gov/archives/news/testimony/the-fbis-cyber-division>)

**bot** ('bɒt)

[..] derived from the word “robot”, [...] and commonly refers to a software program that performs repetitive functions, such as indexing information on the Internet. Bots have been created to perform tasks automatically on Internet Relay Chat (“IRC”) servers. The term “bot” also refers

to computers that have been infected with a program used to control or launch distributed denial of service attacks against other computers. (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

Example: *On or about August 21, 2004, during a chat in IRC, ANCHETA told an unindicted co-conspirator using the nickname “o\_2riginal” that he was hosting “around 100k bots total,” that in a week and a half 1,000 of his bots scanned and infected another 10,000, and that his botnet would be bigger if he had not used some himself for “ddosing.”* (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

**botnet** ( 'bɒt ,nɛt)

A network of computers infected with bots that are used to control or attack computer systems.

Botnets are often created by spreading a computer virus or worm that propagates throughout the Internet, gaining unauthorized access to computers on the Internet, and infecting the computer with a particular bot program.

(<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

Example: *Once he received payment, ANCHETA would set up or configure the purchased botnet for the purchaser, test the botnet with the purchaser in order to ensure that DDOS attacks or proxy spamming would be successfully carried out, or advise the purchaser about how to properly maintain, update, and strengthen the purchased botnet.* (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

**bot herder, bot herder** ( 'bɒt ,hɛrdər)

Individuals who operate SpyEye botnets through SpyEye C&C servers. (<http://krebsonsecurity.com/wp-content/uploads/2014/01/Panin-Indictment.pdf>

Example: *After confidential personal and financial information is obtained through a SpyEye botnet, it is available to the bot herder) to use or provide to other co-conspirators.* (<http://krebsonsecurity.com/wp-content/uploads/2014/01/Panin-Indictment.pdf> )

**breach** ( 'bri:tʃ)



A cyberattack in which an organization's data has been stolen or made public through compromise of networks or systems. (2015 NTT Group Global Threat Intelligence Report)

Example: *Former home office minister Hazel Blears said the TalkTalk data breach was “a wakeup call”. She said it should prompt a debate about whether further regulation was needed “because this is probably the biggest threat to our economy”.*

(<http://www.bbc.com/news/uk-34622754>)

**brute force (attack)** ('bru:t 'fɔ:s 'ə'tæk)

Process whereby an attacker tries many passwords or passphrases with the hope of eventually guessing correctly. The attacker systematically checks all possible passwords and passphrases until the correct one is found. Example: *On Tuesday, we reported that cybercriminals had launched a brute force attack against GitHub accounts. Users reported seeing failed login attempts coming from China, Venezuela, Indonesia, Ecuador and other countries.*

**CERT** ('si: 'i: 'ɑ: 'ti)

Computer Emergency Response Team. Expert groups that handle computer security incidents. Also called computer emergency readiness team and computer security incident response

team (CSIRT). ([https://en.wikipedia.org/wiki/Computer\\_emergency\\_response\\_team](https://en.wikipedia.org/wiki/Computer_emergency_response_team))

Example: *Apart from the national/governmental CERTs, private CERTs who lack a formal governmental mandate could also play a significant role in ensuring the correct functioning of key national communication networks.* ([https://www.enisa.europa.eu/publications/the-directive-on-attacks-against-information-systems/at\\_download/fullReport](https://www.enisa.europa.eu/publications/the-directive-on-attacks-against-information-systems/at_download/fullReport))

**clicker** ('klikə)

Malicious code or exploits that redirect victim machines to specified web sites or other Internet resources. (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

Example: *Clickers can be used for advertising purposes or to lead a victim computer to an infected resource where the machine will be attacked further by other malicious code.* (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf>)

**cloud computing** ('klaʊd kəm'pjʊ:tɪŋ)

A kind of Internet-based computing that provides shared processing resources and data to computers and other devices on demand.

Example: *The main concern arising from the growing reliance on cloud computing is less the possible increase in cyber fraud or crime than the loss of control over individual identity and data.*

([http://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/462509/IPOL-LIBE\\_ET\(2012\)462509\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/462509/IPOL-LIBE_ET(2012)462509_EN.pdf))

**CNP (transaction)** ('si: 'en 'pi: træn'zækʃən)

Card not present: payment card transaction made where the cardholder does not or cannot physically present the card for a merchant's visual examination at the time that an order is given and payment effected, such as for mail-order transactions by mail or fax, or over the telephone or Internet. ([https://en.wikipedia.org/wiki/Card\\_not\\_present\\_transaction](https://en.wikipedia.org/wiki/Card_not_present_transaction))

Example: *In 2012, 60% of the total payment card fraud value occurred when the card was not present (CNP) at the transaction, which occurs predominantly online.* (<https://www.europol.europa.eu/iocta/2014/chap-3-4-view1.html>)

**computer data** (kəm'pjʊ:tə 'deɪtə, also 'dɑ:tə)

Any representation of facts, information or concepts in a form suitable for processing in a computer system, including a program suitable to cause a computer system to perform a function.

(CoE Convention on Cybercrime).

Example: *If only a minuscule fraction of offences involving computer data and systems can be prosecuted, victims have a very limited expectation of justice. This raises questions regarding the rule of law in cyberspace.* ([http://www.coe.int/t/dghl/cooperation/economiccrime/Source/Cybercrime/TCY/2015/T-CY\(2015\)10\\_CEG%20challenges%20rep\\_sum\\_v8.pdf](http://www.coe.int/t/dghl/cooperation/economiccrime/Source/Cybercrime/TCY/2015/T-CY(2015)10_CEG%20challenges%20rep_sum_v8.pdf))

**computer system** (kəm'pjʊ:tə 'sɪstəm)

Any device or a group of interconnected or related devices, one or more of which, pursuant to a program, performs automatic processing of data. (CoE Conventions on Cybercrime, Example: *Each Party shall adopt such legislative and other measures as may be necessary to establish*

*as criminal offences under its domestic law, when committed intentionally, the access to the whole or any part of a computer system without right.* (CoE Convention on Cybercrime)

**cookie** ('kʊki)

Cookies are small files stored on a user's computer by the user's web browser. Upon a user's connection to a webmail server, the server can read the data in the cookie and obtain information about that specific user. (US v Dokuchaev et al.) Example: *The cookie itself does not reveal any personal information about you, but it allows the website storing the cookie to link a particular action with a specific user.* ([http://cybercrimenews.norton.com/nortonretail/feature/prevention/cookies\\_friend\\_or\\_foe/index.html](http://cybercrimenews.norton.com/nortonretail/feature/prevention/cookies_friend_or_foe/index.html))

**cracking** ('krækiŋ)

Gaining access to a system by cracking a password (<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *Another method of cracking a password include combining letters, symbols or numbers to form the all possible combinations of a password and then trying them one by one to find the correct password.* (<http://www.ijcaonline.org/research/volume127/number16/singh-2015-ijca-906706.pdf>)

**credit card fraud** ('krɛdɪt 'kɑ:d fr'ɔ:d)

Theft of goods or services using false or stolen credit card information.  
([http://cyber.law.harvard.edu/cybersecurity/Keyword\\_Index\\_and\\_Glossary\\_of\\_Core\\_Ideas#Keyword\\_Index\\_and\\_Glossary\\_of\\_Core\\_Ideas](http://cyber.law.harvard.edu/cybersecurity/Keyword_Index_and_Glossary_of_Core_Ideas#Keyword_Index_and_Glossary_of_Core_Ideas))

Example: *IP addresses are also recorded in e-commerce type transactions to provide a point of reference in situations where credit card fraud has occurred.* (<https://www.icewarp.eu/privacy/>)

**crimeware** ('kraɪm,wɛə)

Software tools designed to aid criminals in perpetrating online crime. Refers only to programs not generally considered desirable or usable for ordinary tasks. ([http://cyber.law.harvard.edu/cybersecurity/Keyword\\_Index\\_and\\_Glossary\\_of\\_Core\\_Ideas#Keyword\\_Index\\_and\\_Glossary\\_of\\_Core\\_Ideas](http://cyber.law.harvard.edu/cybersecurity/Keyword_Index_and_Glossary_of_Core_Ideas#Keyword_Index_and_Glossary_of_Core_Ideas))

Example: *The increasing proportion of these attacks which relate to some form of hacking or malware can be attributed to the increasing availability of crimeware kits and hacking services available on the digital underground.* (<https://www.europol.europa.eu/iocta/2014/chap-3-7-view1.html>)

**cryptocurrency** (,kɹɪptəʊ'kɹɒnsɪ)

Medium of exchange using cryptography to secure the transactions and to control the creation of additional units of the currency. Bitcoin is one of the most famous ones. (<https://en.wikipedia.org/wiki/Cryptocurrency>)

Example: *It is difficult to evaluate the EC's plan, since at the moment it is extremely general and vague. However, very likely it will open the door for the introduction of cryptocurrencies to the EU payment services regulations.* (<https://www.onelife.eu/zh/news/eu-proposal-cryptocurrencies>)

**cryptography**(kɹɪp'tɒgrəfi)A method of storing and transmitting data in a particular form so that only those for whom it is intended can read and process it. (<http://searchsoftwarequality.techtarget.com/definition/cryptography>)

Example: *ENISA started its efforts in the area of cryptography by identifying and analysing reference documents from EU member states where the cryptographic protective measures are identified and recommended.* (<https://www.enisa.europa.eu/topics/data-protection/security-of-personal-data/cryptographic-protocols-and-tools>)

**CSRF attack** ('si: 'es 'ɑ:r 'ɛf ə'tæk)

Cross-site request forgery (or “sea-surf”) attack. Malware from someone who appears to be a trusted user of a site. (<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *Unlike cross-site scripting (XSS), which exploits the trust a user has for a particular site, CSRF exploits the trust that a site has in a user’s browser.* (<http://remote.eptron.eu/etms/docs/general/security.html>)

**cyberattack, cyber attack** ('saɪbərə,tæk)

An attempt by hackers to damage, disrupt or destroy a computer network system (2015 NTT Group Global Threat Intelligence Report) Example: *During that time period, certain members of Anonymous have waged a deliberate campaign of online destruction, intimidation, and criminality, as part of which they have carried out cyber attacks against businesses and government*

**cyberbullying** (saɪbə'bulɪŋ)

Using the Internet, cell phones, video games, or other technology gadgets to send, text, or post images intended to hurt or embarrass another person. (<https://nobullying.com/what-is-cyberbullying/>) Example: *If it is simple to read intentionality in the episodes of traditional bullying, in cyberbullying responsibility can be extended and shared to those who “simply” watch a video and decide to send it to others.* (<http://www.bullyingandcyber.net/en/definitions/>)

**cyberstalking** ('saɪbə ,stɔ:kɪŋ)

Crime of using the Internet, email, or other types of electronic communications to stalk, harass, or threaten another person.

(<http://legaldictionary.net/cyberstalking/>) Example: *A victim of cyberstalking can apply to the courts under the Protection from Harassment Act 1997 (PfHA) to obtain an immediate civil injunction restraining a stalker from continuing the offensive conduct online.* ([http://www.stalkinghelpline.org/wpcms/wp-content/uploads/8005352\\_1-NSH-FAQ-Final-2.pdf](http://www.stalkinghelpline.org/wpcms/wp-content/uploads/8005352_1-NSH-FAQ-Final-2.pdf))

**dark web** ('da:k 'wɛb)

Private networks not accessible by the general public. These networks are often used for nefarious or illegal purposes. (2015 NTT Group Global Threat Intelligence Report) Example: *A hacker is reportedly selling on the dark web copies of databases stolen from three unidentified U.S. healthcare organizations and one unnamed health insurer containing data on nearly 10 million individuals for prices ranging from about \$96,000 to \$490,000 in bitcoin for each database.* (<http://www.databreachtoday.com/3-stolen-health-databases-reportedly-for-sale-on-dark-web-a-9227>)

**data diddling**

('deɪtə ('da:tə) 'dɪdlɪŋ)

Modifying data for fun and profit;  
e.g., modifying grades, changing credit ratings, altering security clearance information, fixing salaries, or circumventing book-keeping and audit regulations.

**data leakage**

('deɪtə ('da:tə) 'li:kɪdʒ)

Uncontrolled, unauthorized transmission of classified information from a data center or computer system to the outside. (*For the first time this European Fraud Update also includes information on Payment Fraud, with Nine countries reported data leakage from hotel booking sites and one country reported contactless card fraud.*)

**data mining** ('deɪtə also 'da:tə'maɪnɪŋ)

The process of extracting hidden information and correlations from one or more databases or collections of data that would not normally be revealed by a

simple database query. *One example of data mining techniques used in the financial sector with the aim of detecting potential terrorists is the Investigative Data Warehouse (IDW) of the FBI.*

**deep web** ('di:p 'web)

Any Internet information or data that is inaccessible by a search engine and includes all Web pages, websites, intranets, networks and online communities that are intentionally and/or unintentionally hidden, invisible or unreachable to search engine crawlers. Also known as hidden Web, Undernet, Deepnet or Invisible Web.

**defacement**

(di'feismənt) A type of vandalism, when a website is marked by hackers or crackers who are trying to make their mark. The usual targets for defacement are government organizations and religious websites..

**denial of service** (di'naɪəl əv 'sɜ:vɪs)

An action where a user or organization is deprived of the services of a resource they would normally expect to have. (Example: *But the minister responsible for the census, Michael McCormack, dismissed privacy concerns and insisted the website was not “attacked”, despite confirming the site was shut down after repeated denial of service attempts.*

**DoS attack** ('di: 'əʊ 'ɛs ə'tæk)

Overwhelming or saturating resources on a target system to cause a reduction of availability to legitimate users. On the Internet, it usually involves spoofing packets or e-mail headers. *The DoS attacks (Denial of Service) are different than the previous (IP spoofing, ...) as the goal is no longer to gain access to a network, but rather to render a service offered by a car unavailable to users, using different techniques*

**DDoS attack** ('di: 'di: 'əʊ 'ɛs ə'tæk)

A type of malicious computer activity where an attacker causes a network of compromised computers to “flood” a victim computer with large amounts of

data or specified computer commands. (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

Example: *A DDOS attack typically renders the victim computer unable to handle legitimate network traffic and often the victim computer will be unable to perform its intended function and legitimate users are denied the services of the computer.* (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

**domain hijacking** (də'mein 'haɪdʒækɪŋ)

Act of changing the registration of a domain name without the permission of its original registrant. ([https://en.wikipedia.org/wiki/Domain\\_hijacking](https://en.wikipedia.org/wiki/Domain_hijacking))

Example: *This will help prevent domain hijacking which happens when a domain registrar is hacked and the ip addresses changed to point to another server.* (<http://www.ippatrol.eu/blog2011.html>)

**domain name system** (DNS) (də'mein 'neɪm 'sɪstəm)

System for naming computers and hierarchical system of names, standards, and servers that organizes the internet as an aggregate of domains, and enables the translation of domain names into their unique four-part Internet Protocol (IP) addresses. (<http://www.businessdictionary.com/definition/domain-name-system-DNS.html>)

Example: *The Infoblox DNS Threat Index is an indicator of malicious infrastructure-building activity worldwide that exploits the Domain Name System (DNS).* ([https://www.infoblox.com/sites/infobloxcom/files/resources/infoblox-whitepaper-dns-threat-index-q1-2016-report\\_0.pdf](https://www.infoblox.com/sites/infobloxcom/files/resources/infoblox-whitepaper-dns-threat-index-q1-2016-report_0.pdf))

**dox** (dɒks)

Publicly disclosing online a victim's personal identifying information, such as the victim's name, address, Social Security number, email account, and telephone number, with the object of, among other things, intimidating the victim and subjecting the victim to



harassment. (US v Ackroyd et al, <https://freakons.org/wp-content/uploads/court-documents/Ryan-Ackroyd.pdf> )

Example: *[The] coconspirators used information gained from those stolen emails to access, without authorization, and steal the contents of an email account belonging to a senior executive of HBGary, Inc. (the “HBGary, Inc. Executive”); [...]; and dox the HBGary Federal Executive by, among other things, posting his Social Security number and home address on his Twitter account without his authorization or approval.* (US v Ackroyd et al).

**DNS** ('di: 'en 'es)

See **domain name system**.

Example: *Cybercriminals are increasingly using false DNS servers to intercept legitimate Web addresses and redirect users to fake sites in order to capture personal information or install malware.*

(<http://www.computerweekly.com/tip/DNSserver-security-Finding-and-using-DNSSEC-tutorial-resources>)

**dumpster diving** ('dʌmpstə 'daɪvɪŋ)

A method of obtaining proprietary, confidential or useful information by searching through trash discarded by a target.

([http://cyber.law.harvard.edu/cybersecurity/Keyword\\_Index\\_and\\_Glossary\\_of\\_Core\\_Ideas#Keyword\\_Index\\_and\\_Glossary\\_of\\_Core\\_Ideas](http://cyber.law.harvard.edu/cybersecurity/Keyword_Index_and_Glossary_of_Core_Ideas#Keyword_Index_and_Glossary_of_Core_Ideas))

Example: *Dumpster diving may provide them with even more sensitive information such as usernames, passwords, credit card statements, bank statements, ATM slips, social security numbers, telephone numbers, etc.*

(<http://blog.globalknowledge.com/technology/security/hacking-cybercrime/the-5-phases-every-hacker-must-follow/>)

**electronic funds transfer fraud** (ɪlɛk'trɒnɪk 'fʌndz 'trænsfə 'frɔ:d)

Crime related to the transfer of funds over the Internet, by diverting funds, stealing financial information, etc.

**encryption** (ɪnˈkrɪptʃən)

Scrambling sensitive information so that it becomes unreadable to everyone except the intended recipient. (<http://www.businessdictionary.com/definition/encryption.html#ixzz4Gk3nm2sY>) Example: *However, striking the right balance in cyberspace has become particularly challenging due to the ever increasing use of encryption and online anonymity tooling.* (<https://www.europol.europa.eu/content/privacy-digital-age-encryption-anonymity-online>)

**exchangeable image file format (EXIF)**

(ɪksˈtʃeɪndʒəbl̩ ˈɪmɪdʒ ˈfaɪl ˈfɔːmət)

A variation of JPEG, used by almost all digital cameras to record extra interchange information to image files as they are taken. (<http://graphicssoft.about.com/od/exifinformation/>)

Example: *Government expert witnesses testified that they had examined the “metadata” or “EXIF” data, which is information about a picture that is embedded in the picture such as the date and time the photo was taken, from Mr. Gutierrez’s electronic devices to determine the dates and times the photographs were taken.* (<http://cases.justia.com/federal/appellate-courts/ca10/14-2129/14-2129-2015-09-14.pdf?ts=1442246454>)

**exploit** (ˈɛksplɔɪt)

Computer code written to take advantage of a vulnerability or security weakness in a computer system or software. (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf>)

Example: *If attackers have control of your Internet connection, they have the ability to insert exploits into any website you visit.* ([https://securityevaluators.com/knowledge/case\\_studies/iphone/](https://securityevaluators.com/knowledge/case_studies/iphone/))

**extension** (ɪkˈstɛnʃən)

An identifier specified as a suffix to the name of a computer file. The extension indicates a characteristic of the file contents or its intended use. A file extension is typically delimited from the filename with a full stop (period). ([https:// en.wikipedia.org/wiki/Filename\\_extension](https://en.wikipedia.org/wiki/Filename_extension))

Example: *If child pornographic photographs were taken by the user himself, the exif data of the photographs may shed light on the tools and locations for taking those photographs.* (Information Resources Management Association (2011) *Cyber Crime: Concepts, Methodologies, Tools and Applications*. Gale Virtual Reference Library.)

**firewall** ('faɪəwɔ:l)

Software or hardware designed to control incoming and outgoing network traffic having analyzed the data packets and having determined whether they should be allowed, based on a predetermined rule set. (2015 NTT Group Global Threat Intelligence Report)

Example: *Personal firewalls should be installed on each computer that is connected to the internet and monitors (and blocks, where necessary) internet traffic. They are also sometimes known as 'software firewalls' or 'desktop firewalls'.* ([https:// www.getsafeonline.org/protecting-your-computer/ firewalls/](https://www.getsafeonline.org/protecting-your-computer/firewalls/))

**flash drive** ('flæʃ 'draɪv)

See **USB stick**.

Example: *Ratigan was charged in May 2011 after police received a flash drive from his computer containing hundreds of images of children, most of them clothed, with the focus on their crotch areas.* ([https://www.neweurope.eu/article/us-prosecutors- seek-50-year-sentence-priest-who-pleaded- guilty-child-porn-charges/](https://www.neweurope.eu/article/us-prosecutors-seek-50-year-sentence-priest-who-pleaded-guilty-child-porn-charges/))

**grooming** ('gru:mɪŋ; also 'gromɪŋ)

Building an emotional connection with a child to gain their trust for the purposes of sexual abuse or exploitation. ([https://www.nspcc.org. uk/preventing-abuse/child-abuse-and-neglect/ grooming/](https://www.nspcc.org.uk/preventing-abuse/child-abuse-and-neglect/grooming/))

Example: *The court ruled that the doctor could testify about “grooming,” his opinion that Hofus was not a hebophile, and generally about fantasy- based communications.* (US v Hofus, <http://cyb3rcrim3.blogspot.com.es/2010/03/fantasy-alone.html>)

**hacker** ('hækə(r))

In computing, any skilled computer expert that uses their technical knowledge to overcome a problem. While “hacker” can refer to any computer programmer, the term has become associated in popular culture with a “security hacker”, someone who, with their technical knowledge, uses bugs or exploits to break into computer systems. (<https://en.wikipedia.org/wiki/Hacker>) Example: *At certain times relevant to this Indictment, AMIN SHOKOHI, the defendant, was a computer hacker who worked for ITSec Team.* (US v Fathi et al)

**hacktivism, hactivism** ('hæktivizəm)

Politically- or ideologically-motivated vandalism.

Defacing a Web site for no particular reason is vandalism; the same defacement to post political propaganda or to cause harm to an ideological opponent is hacktivism. (<http://www.mekabay.com/overviews/glossary.pdf> )

Example: *The government sector has been targeted the most by hacktivism in 2016 by a large margin. The data breach of the Philippines Commission on Elections is by far the top trending hacktivism target.* (<https://blog.surfwatchlabs.com/2016/05/26/anonymous-ops-trendinggovernment-targeted-where-are-the-otherhacktivists/>)

**hoax email** ('həʊks 'i:meɪl)

Phoney email, usually an alert about a non-existent threat, that is passed throughout a system by a large number of individuals who believe it to be true – and that overwhelms the system as a result. (<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *A fisherman from Messolonghi, a car worker from Chania, a self-employed from Athens and two other unidentified persons are targeted by*

*the cyber-crime police as the senders of the hoax e-mail claiming the collapse of the Greek economy.* (<http://www.keeptalkinggreece.com/2011/03/17/five-targetted-by-cyber-police-on-hoax-e-mail-claiming-collapse-of-economy/>)

**honeypot** ('hʌni,pɒt)

Decoy systems set up to gather information about an attack or attacker and to potentially deflect that attack from a corporate environment. (2015 NTT Group Global Threat Intelligence Report)

*Example: As soon as an attacker sends data to the honeypot, it issues an alert. The attacker will most likely start rummaging around, performing passive scans of hosts on the network. The beauty of a honeypot is, legitimate users know it is fake.* (<http://www.americanbanker.com/news/bank-technology/deception-may-be-the-bestway-to-catch-cybercriminals-1076667-1.html>)

**hosting** ('həʊstɪŋ)

Using a remote hosting service provider to host websites, data, applications and/or services. Also also known as Web hosting. *Example: Earlier this year, the FBI busted shady web-hosting company Freedom Hosting – known for turning a blind eye to child porn websites.* (<https://www.newscientist.com/article/dn24345-silk-road-bust-hints-at-fbis-new-cybercrimepowers/>)

*Example: Even people who don't use social networks at all can be affected by identity theft.*

**identity theft** (aɪ'dentɪtɪ 'θɛft)

Creating a false identity using someone else's identifying information (e.g., name, Social Security Number, birthday)

to create new credit cards or establish loans which then go into default and affect the original victim's credit record.

*Example: Even people who don't use social networks at all can be affected by identity theft.*

**injection** (ɪn'dʒɛkʃən)

An attack performed by inserting malicious code or data into what the receiving system sees as a valid query. (2015 NTT Group Global Threat Intelligence Report)

Example: *Beginning on or about October 23, 2007, Company A was the victim of a SQL Injection Attack that resulted in the placement of malware on its network.* ([https://www.wired.com/images\\_blogs/threatlevel/2009/08/gonzalez.pdf](https://www.wired.com/images_blogs/threatlevel/2009/08/gonzalez.pdf))

**IP ('ai 'pi:)**

Intellectual property.

Example: *It is essential to deepen the understanding of how the online environment interacts with IP infringements. We noticed IPRs are systematically being misused as a way to disseminate malware, carry out illegal phishing and simple fraud to the detriment of consumers, businesses and the ordinary user of the internet.* (<https://www.europol.europa.eu/content/launch-ipc3-europe%E2%80%99s-response-intellectual-property-crime>)

**IP address ('ai 'pi: ə'dres)**

Internet Protocol Address. A unique numeric address used by computers on the Internet. An

IP address is designated by a series of four numbers, each in the range 0-255, separated by periods (e.g., 121.56.97.178). (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> ) Example: *Interestingly, a pretty impressive 26% [of teenagers] knows how to hide their IP address.* ([http://newsroom.kaspersky.eu/en/texts/detail/article/is-your-teenager-a-hacker/?no\\_cache=1&cHash=101e326a5cdaa60ec6086efd](http://newsroom.kaspersky.eu/en/texts/detail/article/is-your-teenager-a-hacker/?no_cache=1&cHash=101e326a5cdaa60ec6086efd)

1b08193d)

**IRC (Internet Relay Chat) ('ai 'ɑ: 'si:)**

A network of computers connected through

the Internet that allows users to communicate with others in real time text (known as “chat”). (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

Example: *IRC channels are also used to control botnets) that are used to launch DDOS attacks, send unsolicited commercial email, and generate advertising affiliate income.* (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

**ISP** ('aɪ 'ɛs 'piː)

Internet Service Provider.

Example: *If the ISPs exercise editorial control over messages posted on bulletin boards, use Board Leaders to enforce the content guidelines or provide them with an emergency delete function to control content there is great likelihood that they may end up being treated as a primary publisher.* (<https://indiancaselaws.files.wordpress.com/2014/04/cyberdefamation-liabilities-of-internet-service-providers-isp-and-intermediary.pdf> )

**IT** ('aɪ 'tiː)

Information technology.

Example: *If members of management are found to be in breach of their duty to ensure appropriate IT security, they are personally at risk of claims for damages being brought against them by their employer.* (<http://de.vgd.eu/en/news/in-practicehow-secure-is-your-it-system>)

**keylogger** (ki: 'lɒgə)

A type of malicious software designed to monitor the keystrokes input into an infected computer and to transmit this data back to the hacker. Example: *Backdoor Trojans typically come with a built-in keylogger; and the confidential data is relayed to a remote hacker to be used to make*

**key logging** (ki: 'lɒgɪŋ)

Recording the keystrokes made by an authorized user. (<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *Imran Uddin used four key-logging devices on university computers to capture login details from staff members, including one who had access to the system which kept records of his grades.*

(<https://www.easterneye.eu/news/>  
alteringgrades)

detail/scamming-student-jailed-for-

**latency** ('leitənsɪ)

Period during which a time bomb, logic bomb, virus or worm refrains from overt activity or damage (delivery of the payload).

Example: *Long latency coupled with vigorous reproduction can result in severe consequences for infected or otherwise compromised systems.*

**logic bomb** ('lɒdʒɪk 'bɒm)

Program in which damage (the payload) is delivered when a particular logical condition occurs; e.g., not having the author's name in the payroll file. Logic bombs are a kind of Trojan Horse; time bombs are a type of logic bomb. Example: *Former UBS PaineWebber system administrator, Roger Duronio, has been charged with sabotaging company computer systems in an attempt to manipulate its stock price. Duronio*

*placed logic bombs that deleted files on the computers.*

**mail-bombing** ('meɪl ,bɒmɪŋ)

Sending large numbers of unwanted e-mail messages to a single recipient or to a group of such recipients. To be distinguished from spamming. Mail-bombing is a form of denial of service. Example: *Spammers could become the victims of mail-bombing, as thousands of irate spam recipients.*

**malware** ('mæl ,wɛ(ə))

Computer code with malicious intentions. Malware includes Trojan horses, ransomware, rootkits, scareware, spyware, viruses and worms

**misinformation spread** ( ,mɪsɪnfə'meɪʃən 'spred)

Using the Internet to circulate incorrect information and cause panic

**moneymule** ('mʌni ,mju:l)

Individual who is used to transport or launder stolen money in furtherance of criminal activity and its related organizations. These individuals can be either wittingly or unwittingly participating in the fraud. **notice and takedown**

('nəʊtɪs ən 'teɪkdaʊn)



Process operated by online hosts in response to court orders or allegations that content is illegal. Content is removed by the host following notice

**P2P** ('pi: 'tu: 'pi:)

Peer to peer, person to person. A computing or networking distributed application architecture that partitions tasks or workloads among peers. (<https://en.wikipedia.org/wiki/P2P>) Example: *Of P2P users arrested in 2009, 33 percent had photos of children age three or younger and 42 percent had images of children that showed sexual violence.* ([http://www.huffingtonpost.com/mary-l-pulido-phd/child-pornography-basic-f\\_b\\_4094430.html](http://www.huffingtonpost.com/mary-l-pulido-phd/child-pornography-basic-f_b_4094430.html))

**payload** ('peɪ,ləʊd)

Unauthorized activities of malicious software. (<http://www.mekabay.com/overviews/glossary.pdf> )

Example: *Attachments attempt to install their payload as soon as you open them. Your internal defenses may protect you, but don't count on it.* (<https://cybercoyote.org/security/av-top.htm>)

**penetration** (,pɛnɪ'treɪʃən)

Unauthorized access to restricted systems or resources. Example: *For many computer virus writers and cybercriminals, the objective is to distribute their virus, worm or Trojan virus to as many computers or mobile phones as possible – so that they can maximise malware penetration.* (<http://www.kaspersky.co.uk/internet-security-center/threats/malware-system-penetration>)

**pharming** ('fɑ:mɪŋ)

Redirecting users from a legitimate site to a bogus one; information entered on the phoney site is captured for fraudulent purposes.

**phishing** ('fɪʃɪŋ)

Directing users to a bogus site through an email that appears legitimate; information entered on the phony site is captured for fraudulent purposes. (<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *We caution consumers to be on the lookout for phishing scams in which various fraudulent emails, claiming to come from the bank, that ask you to click on links to update account or personal information. These are not legitimate emails from the bank; instead, they are fraudulent emails sent as part of a scam in which criminals try to trick people into divulging their confidential information.* (<https://www.vistbank.com/security/online-scams/>)

**piggybacking** ('pi:gi,bækɪŋ)

Entering secure premises

by following an authorized person through the security grid; also unauthorized access to information by using a terminal that is already logged on with an authorized ID (identification). (<http://www.mekabay.com/overviews/glossary.pdf>)

Example: *Furthermore, a network that is vulnerable to piggybacking for network access is equally vulnerable when the purpose is data theft, dissemination of viruses, or some other illicit activity.* (<http://whatis.techtarget.com/definition/piggybacking>)

**POS** ('pi: 'əʊ 'es)

Point of Sale.

Time and place where a retail transaction is completed. Acronym for point of sale. ([https://en.wikipedia.org/wiki/Point\\_of\\_sale](https://en.wikipedia.org/wiki/Point_of_sale))

Example: *POS malware aims to scrape the RAM memory of POS terminals in order to steal credit and debit card data. It is particularly attractive for cybercriminals because rewards can be lucrative and they do not need to be physically present to execute an attack.* (<https://securityintelligence.com/pos-malware-and-loyalty-card-fraud-growing-in-popularity/>)

**proxy server** ('prɒksɪ 'sɜ:və)

A server (a computer system or an application)

that acts for client's requests seeking resources from other servers. ([https://en.wikipedia.org/wiki/Proxy\\_server](https://en.wikipedia.org/wiki/Proxy_server))

Example: *Using a proxy server anyone can bounce their activity off a system that is either in a far distant country, or keeps no records of where the activity originated, or worse still, both.* (<http://www.bbc.com/news/technology-17302656>)

**ransomware** ('rænsəm,wɛə)

A type of malicious software designed to block access to a computer system until a sum of money is paid. (<http://www.oxforddictionaries.com/definition/english/ransomware>) Example: *The United Kingdom Police Ransomware is a computer infection targeted at people who live in the United Kingdom and does not allow you to access your Windows desktop, applications, or files until you pay a ransom.* (<http://www.bleepingcomputer.com/virus-removal/remove-united-kingdom-police-virus>)

**RAT** ('ɑ:r 'eɪ 'ti)

See **remote administration tool**.

Example: *RATs have been used by nation states and hacktivists for many years, but only recently 12 have we seen this remote access attack vector migrate to online banking fraud, where the main use is to neutralize all device-related defenses such as device recognition, IP geo-location, and proxy detection.* ([http://informationsecurity.report/Resources/Whitepapers/bbb3b0fb-9ba1-4602-8cec-17dcb2381892\\_detecting-remote-access-attacks-on-online-banking-sites-pdf-7-w-1088.pdf](http://informationsecurity.report/Resources/Whitepapers/bbb3b0fb-9ba1-4602-8cec-17dcb2381892_detecting-remote-access-attacks-on-online-banking-sites-pdf-7-w-1088.pdf))

**remote administration tool (RAT)** (rɪ'məʊt əd'mɪnɪ'streɪʃən 'tu:l)

A piece of software that allows a remote “operator” to control a system as if he has physical access to that system. While desktop sharing and remote administration have many legal uses, “RAT” software is usually associated with criminal or malicious activity. ([https://en.wikipedia.org/wiki/Remote\\_administration\\_software](https://en.wikipedia.org/wiki/Remote_administration_software))

Example: *The art of hacking has become extremely simple in the last couple of years. In the past 10 years, hundreds of new remote administration*

*tool builders were released to the public.* ([http://www. redsocks.nl/blog-2/cybercriminals-use-these-weak- passwords-to-ex-filtrate-stolen-data/](http://www.redsocks.nl/blog-2/cybercriminals-use-these-weak-passwords-to-ex-filtrate-stolen-data/))

**responsible disclosure** (rɪˈspɒnsəbəl dɪsˈklɒʒə)

A vulnerability disclosure model. It is like full disclosure, with the addition that all stakeholders agree to allow a period of time for the vulnerability to be patched before publishing the details ([https://en.wikipedia.org/wiki/Responsible\\_ disclosure](https://en.wikipedia.org/wiki/Responsible_disclosure))

Example: *Implementing a responsible disclosure policy will lead to a higher level of security awareness for your team. Bringing the conversation of “what if” to your team will raise security awareness and help minimize the occurrence of an attack.* (<https://bugcrowd.com/resources/what-is-responsible-disclosure>)

**rogueware** ('rəʊg,wɛə)

A standalone malware computer program that pretends to be a well-known program or a non-malicious one [antivirus] in order to steal money and/or confidential data ([http:// www.collinsdictionary.com/submission/13869/ Rogueware](http://www.collinsdictionary.com/submission/13869/Rogueware))

Example: *Rogueware fake antivirus strains are increasing at a stunning rate. Panda Security reports that this cyber crime bilks users out of about \$34 million every month.* ([http://searchsecurity.techtarget.com/news/1363031/Panda-reports-fast-spreading-rogueware-antivirus-fraud-rakes- in-millions](http://searchsecurity.techtarget.com/news/1363031/Panda-reports-fast-spreading-rogueware-antivirus-fraud-rakes-in-millions))

**rootkit** ('ru:t,kɪt)

A set of programs used to gain unauthorized access to a computer's operating system, esp. in order to destroy or alter files, attack other computers, etc. ([http://www.wordreference.com/ definition/ rootkit](http://www.wordreference.com/definition/rootkit))

Example: *Rootkits have been used increasingly as a form of stealth to hide Trojan virus ity. When installed on a computer, rootkits are invisible to the user and also take steps to avoid being detected by security software.* ([http://www. kaspersky.com/internet-security-center/internet safety/faq](http://www.kaspersky.com/internet-security-center/internet-safety/faq))

**router** ('ru:tə; US 'raʊtə)

Device or, in some cases, software in a computer, that determines the next network point

to which a packet should be forwarded (<http://searchnetworking.techtarget.com/definition/router>)

Example: *Maitland explained to them that as an officer who worked in child protection he used such software some time ago but not recently. He also offered the explanation that he had had issues with his broadband router. He was duly arrested on the suspicion of having downloaded indecent images of children.* (<http://www.mirror.co.uk/news/uk-news/child-abuse-detective-who-wanted-7964107>)

**sabotage** ('sæbə,tɑ:ʒ)

Deliberate damage to operations or equipment (<http://www.mekabay.com/overviews/glossary.pdf>)

Example: *In some countries, computer sabotage may be regarded as a breach of civil law rather than criminal law, but there are laws clearly defining cyber-crime as a criminal offense.* (<http://definitions.uslegal.com/s/sabotage/>)

**salami (slicing) attack** (sə'lɑ:mɪ 'slaisɪŋ ə'tæk)

Making small, undetectable changes over an extended period of time; “penny shaving” is a type of salami attack. Also called salami slicing attack (<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *A typical salami attack would add a small amount to a debit that the account holder would not check, such as a debit that represented a service charge. This small increase in debit (often a few pence or a few cents) would then be credited to the perpetrator's bank account.* (<http://cybercrimeandforensic.blogspot.com.es/2009/11/salami-attacks.html>)

**scareware** ('skeə,wɛə)

Malicious computer programs designed to trick a user into buying and downloading unnecessary and potentially dangerous software, such as fake

antivirus protection: (<http://www.oxforddictionaries.com/definition/english/scareware>)

Example: *A Swedish credit card payment processor was sentenced today to 48 months in prison for his role in an international cyber crime ring that netted \$71 million by infecting victims' computers with scareware and selling rogue antivirus software that was supposed to secure victims' computers but was, in fact, useless.* (<https://archives.fbi.gov/archives/seattle/press-releases/2012/payment-processor-for-scareware-cybercrime-ring-sentenced-to-48-months-in-prison>)

**script kiddy** ('skript 'kɪdɪ)

A derogative term, originated by the more sophisticated crackers of computer security systems, for the more immature, but unfortunately often just as dangerous exploiter of security lapses on the Internet. (<http://searchmidmarketsecurity.techtarget.com/definition/script-kiddy>)

Example: *Because of the many programs available on the internet that were developed by true hackers or crackers, script kiddies are able to easily create mischief, sometimes by simply entering an IP address and clicking a button.* (<http://www.pctools.com/security-news/script-kiddie/>)

**server** ('sɜ:və)

A centralized computer that provides services for other computers connected to it via a network. The other computers attached to a server are sometimes called "clients." (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf>)

Example: *In preparing for a DDoS attack, the malicious actor typically compromises and gains remote control of computers and computer servers by placing malicious software, or malware, on them.* (<https://www.justice.gov/opa/file/834996/download>)

**service provider** ('sɜ:vɪs prə'vaɪdə)

Entity that provides the ability to communicate with the help of a computer system; any other entity that processes or stores computer data on

behalf of such communication service or users of such service. (CoE Convention on Cybercrime) Example: *Each Party shall adopt such legislative and other measures as may be necessary to oblige a service provider to keep confidential the fact of the execution of any power provided for in this article and any information relating to it.* (CoE Conventions on Cybercrime, [http://www.europarl.europa.eu/meetdocs/2014\\_2019/documents/libe/dv/7\\_conv\\_budapest\\_/7\\_conv\\_budapest\\_en.pdf](http://www.europarl.europa.eu/meetdocs/2014_2019/documents/libe/dv/7_conv_budapest_/7_conv_budapest_en.pdf))

**sexting** ('sekstɪŋ)

The sending of sexually explicit photos, images, text messages, or e-mails by using a cell phone or other mobile device. (<http://www.dictionary.com/browse/sexting>) Example: *Over the last year in the province of Ontario, five teens caught sexting (three in Norfolk County and three in the Woodstock area) have been charged with possessing and distributing child pornography.* (<https://news.vice.com/article/canadas-new-cyberbullying-law-is-targeting-teen-sexting-gone-awry>)

**sextortion** (seks'tɔ:ʃən)

Blackmail in which sexual information or images are used to extort sexual favours and/or money from the victim. (<http://www.interpol.int/es/Crime-areas/Cybercrime/Online-safety/Sextortion>)

Example: *And the sentences meted out in sextortion cases in state courts seem inadequate both in purely punitive terms and, given the high rates of recidivism among sex offenders, in terms of public protection.* (<https://www.brookings.edu/research/closing-the-sextortion-gap-a-legislative-proposal/>)

**shoulder surfing** ('ʃəʊldə 'sɜ:fiŋ)

Using direct observation techniques, such as looking over someone's shoulder, to get information. It is commonly used to obtain passwords, PINs, security codes, and similar data.

([https://en.wikipedia.org/wiki/Shoulder\\_surfing\\_\(computer\\_security\)](https://en.wikipedia.org/wiki/Shoulder_surfing_(computer_security)))

Example: *Are you alert to criminals' shoulder- surfing your PIN at a checkout?* ([https:// nationaldebtadvisors.co.za/cybercrime-howsecure- are-our-banks/](https://nationaldebtadvisors.co.za/cybercrime-howsecure-are-our-banks/))

**skimming** ('skɪmɪŋ)

Getting private information about somebody else's credit card used in an otherwise normal transaction. The thief can procure a victim's card number using basic methods such as photocopying receipts or more advanced methods such as using a small electronic device (skimmer) to swipe and store hundreds of victims' card numbers. ([https://en.wikipedia.org/wiki/Credit\\_card\\_fraud#Skimming](https://en.wikipedia.org/wiki/Credit_card_fraud#Skimming))

Example: *Credit card skimming incidents can be difficult to detect. Since your credit card is never lost or stolen. The best way to detect a skimmed credit card is to watch your accounts frequently. Monitor your checking and credit card accounts online at least weekly and immediately report any suspicious activity.* ([http://credit.about.com/od/ privacyconcerns/a/credit-card-skimming.htm](http://credit.about.com/od/privacyconcerns/a/credit-card-skimming.htm))

**smishing** ('smɪʃɪŋ)

Phishing using text messages rather than emails  
(<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Examples: *With this specific wave of smishing attacks, hackers fool customers into downloading their malware by posing as a legitimate, unrelated app. The malware then takes over a legitimate SMS communication between the customer and their bank to socially engineer the customer into giving away their PII information and access their account.* ([http://www.scmagazineuk.com/natwest-online-banking-suffers-sms-smishingscams/ article/481378/](http://www.scmagazineuk.com/natwest-online-banking-suffers-sms-smishingscams/article/481378/))

**social engineering** ('səʊʃəl ,ɛndʒɪ'nɪərɪŋ)

Psychological people manipulation of people with actions or confidential information. Confidence trick which aim is fraud, information gathering, system access, it differs from a traditional “con” in that it is often one of many steps in a



more complex fraud scheme. ([https://en.wikipedia.org/wiki/Social\\_engineering\\_\(security\)](https://en.wikipedia.org/wiki/Social_engineering_(security)))

Example: *Social engineering is becoming ever more targeted and personal, which is why it's no surprise that the number of cases is on the rise. What's worrying, however, is the complex nature of these scams and how they tap perfectly into feelings that make us panic - if we get an email purporting to come from someone we trust (such as our bank) about something that is emotive to us all (money) and then demand that we act urgently, it's almost like the perfect storm.* (<https://www.cityoflondon.police.uk/news-and-appeals/Pages/think-twice-before-act-phishingscams.aspx>)

aspx)

**spam** ('spæm)

Unsolicited commercial email. "Spamming" refers to the mass or bulk distribution of unsolicited commercial email. (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf>)

Example: *Often spammers use computers infected with malicious code and made vulnerable to subsequent unauthorized access by routing spam through the victim computer in order to mask their originating email and IP address information. In this way, the infected computer serves as a "proxy" for the true spammer.* (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf>)

**spear-phishing** ('spiə 'fiʃɪŋ)

A highly targeted phishing attack, using knowledge about a specific person or organization.

(2015 NTT Group Global Threat Intelligence Report) Example: *However, in recent years cybercriminals have upped their phishing game with more sophistication. Spear phishing emails are crafted in order to make someone believe they're from a legitimate source. The messages might appear to come from banks or businesses, and could include full names, usernames, and other*

*personal info.* (<https://blog.malwarebytes.com/101/2016/01/hacking-your-head-how-cybercriminals-use-social-engineering/>)

**spoofing** ('spu:fiŋ)

A fraudulent or malicious practice in which communication is sent from an unknown source disguised as a source known to the receiver. (<https://www.techopedia.com/definition/5398/spoofing>)

Example: *Phishing is basically tricking someone to give up sensitive information – usually social and bank account credentials and credit card details. Spoofing, on the other hand, refers to how cybercrooks actually trick their target – by posing as a well-known, trustworthy entity. So, more often than not, phishers rely on spoofing in order for their phishing scams to be successful.* (<http://www.bullguard.com/bullguard-security-center/internet-security/internet-threats/spoofing-recurring-internet-security-threat.aspx>)

**spyware** ('spai,wɛə)

Except as provided in Subsection 7)(b), “spyware means software on the computer of a user who resides in this state that: (i) collects information about an Internet website at the time the Internet website is being viewed in this state, unless the Internet website is the Internet website of the person who provides the software; and (ii) uses the information described in Subsection (7)(a)(i) contemporaneously to display pop-up advertising on the computer (<https://le.utah.gov/~2005/bills/static/HB0104.html>)

Example: *The implementation and enforcement of the provisions of this Directive often require cooperation between the national regulatory authorities of two or more Member States, for example in combating cross-border spam and spyware.* (Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009)

**synflood** ('sɪn,flʌd)

A type of DDOS attack where a computer or network of computers send a large number of “syn” data packets to a targeted computer. Syn packets are sent by a computer that is requesting a connection with a destination computer. A

synflood typically involves thousands of compromised computers in a botnet that flood a computer system on the Internet with “syn” packets containing false source information.

The flood of syn packets causes the victimized computer to use all of its resources to respond to the requests and renders it unable to handle legitimate traffic. (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

Example: *On or about July 24, 2004, during a chat in IRC, zxpL again asked ANCHETA to conduct a synflood DDOS attack, this time against an IP address belonging to Sanyo Electric Software Co., Ltd. in Osaka, Japan, which zxpL identified for ANCHETA.* (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf>)

**temporary internet file** ('tempərərɪ 'ɪntəˌnɛt 'faɪl)

A file that is located on a computer’s hard drive that a browser uses to store Web site data for every Web page or URL address that is visited. ([http://www.webopedia.com/DidYouKnow/Internet/Temporary\\_Internet\\_Files.asp](http://www.webopedia.com/DidYouKnow/Internet/Temporary_Internet_Files.asp))

Example: *Under the “Jim” profile, there was a temporary internet file known as the Web “cache,” an*

*automatic storage mechanism designed to quickly display previously visited web pages.* ([http:// www.ediscoverylawalert.com/2010/11/articles/legal-decisions-court-rules/cached-webfiles-may-serve-as-evidence-in-child-pornography- case/](http://www.ediscoverylawalert.com/2010/11/articles/legal-decisions-court-rules/cached-webfiles-may-serve-as-evidence-in-child-pornography-case/))

**thumbnail** (θʌmˌneɪl)

A miniature display of a page to be printed. Thumbnails enable you to see the layout of many pages on the screen at once (<http://www.webopedia.com/TERM/T/thumbnail.html>)

Example: *Special Agent Blackmore attempted to download these files, but was unsuccessful. (Id.). He did, however, capture of number of thumbnail images that depicted child pornography.* ([https://www.gpo.gov/fdsys/pkg/USCOURTS-mnd-0\\_13-cr-00256/pdf/USCOURTS-mnd-0\\_13-cr-00256-0.pdf](https://www.gpo.gov/fdsys/pkg/USCOURTS-mnd-0_13-cr-00256/pdf/USCOURTS-mnd-0_13-cr-00256-0.pdf))

**time bomb** ('taɪm ,bɒm)

Program or batch file waits for a specific time before causing damage. Often used by disgruntled and dishonest employees who find out they're to be fired or by dishonest consultants who put unauthorized time-outs into their programs without notifying their clients. (<http://www.mekabay.com/overviews/glossary.pdf> ) Example: *Clayton did not pay its bill, and PSC, claiming the need to make program changes, went to Clayton's place of business and secretly installed a "time bomb" that at a pre-set time would lock the system so Clayton could not access its files.* (<http://cyber.law.harvard.edu/property00/alternatives/roditti.html>)

**trojan (horse)** ('trɔʊdʒən 'hɔ:s)

A malicious program that is disguised as a harmless application or is secretly integrated into legitimate software. (<http://news.findlaw.com/hdocs/docs/cyberlaw/usanchetaind.pdf> )

Example: *Ukrainian experts in information security are sure that 95% of victims of the hacker group were wiretapped via a trojan on their phones.* (<http://belsat.eu/en/news/banda-hakerau-tsikankurenty-kdb/>)

**unallocated cluster** (ʌn'ælə ,keɪtɪd 'klʌstə)

Area on a hard drive where the data belonging to deleted files can be found. The data will remain there until it is overwritten by another file. (<http://kb.digital-detective.net/display/HstEx3/File+System+Data+Recovery>)

Example: *Using my forensic software I was able to locate 73 pictures files in the unallocated clusters which had been deleted and were no longer accessible to the camera user.* ([http://www.mccannpjfiles.co.uk/PJ/VIDEO\\_MEMORY.htm](http://www.mccannpjfiles.co.uk/PJ/VIDEO_MEMORY.htm))

**URL** ('ju: 'ɑ:r 'el, also 'ɜ:l)

Uniform Resource Locator. Unique address for a file that is accessible on the Internet. (<http://searchnetworking.techtarget.com/definition/URL>)

Example: *It is no secret that cyber criminals also use URL shorteners to aid them in achieving their objectives. URL shorteners are often used by cyber*

*criminals to obfuscate redirects to malicious destinations.*  
(<https://blog.malwarebytes.com/threatanalysis/2016/01/when-url-shorteners-andransomware-collide/>)

**USB stick** ('ju: 'es 'bi: 'stik)

A plug-and-play portable storage device that uses flash memory and is lightweight enough to attach to a keychain. Also called flash drive.  
(<http://searchstorage.techtarget.com/definition/USB-drive>)

Example: *In February 2012 he was arrested and confessed to using his work computer to download pictures of children, share them online, and discuss them with other adults. Officers found a total of 3,699 images and videos stored on his computer, a USB stick and a hard drive, including 295 of children being abused.* ([http://www.oxfordmail.co.uk/news/10554932.Ex\\_Brookes\\_lecturer\\_guilty\\_over\\_child\\_abuse\\_pictures/?ref=nt](http://www.oxfordmail.co.uk/news/10554932.Ex_Brookes_lecturer_guilty_over_child_abuse_pictures/?ref=nt))

**vandalism** ('vændə,lɪzəm)

Obvious, unauthorized, malicious modification or destruction of data such as information on web sites. (<http://www.mekabay.com/overviews/glossary.pdf>) Example: *Wikipedia bans editing of its pages by Congressional staffers after 'online vandalism. The internet encyclopaedia announces ban in response to "persistent disruptive editing" – such as describing Donald Rumsfeld as a "alien lizard" – by anonymous users in House of Representatives.* (<http://www.telegraph.co.uk/technology/wikipedia/10992143/Wikipedia-bans-editing-of-its-pages-by-Congressional-staffers-after-online-vandalism.html>)

**virus** ('vaɪrəs)

A program that replicates rapidly within a computer causing damage to the host computer  
(<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *Further problems arise with the mass victimization caused by offences such as virus propagation, because the numbers of victims are simply too large to identify and count, and because such programs can continue*

*creating new victims long after the offenders have been caught and punished.*  
([http://www.unodc.org/pdf/crime/10\\_commission/4e.pdf](http://www.unodc.org/pdf/crime/10_commission/4e.pdf) )

**vishing** ('vɪʃɪŋ)

(From “voice” + “phishing”) tricking a user (through an email or phone call) into entering credit card information into a bogus voice response system; information entered into the phony system is captured for fraudulent purposes.  
(<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *The vishing campaign was discovered by researchers from cybercrime intelligence firm PhishLabs while investigating a recent attack against customers of an unnamed midsize bank. The bank’s customers had received text messages claiming their debit cards had been deactivated and instructing them to call a phone number.*  
(<http://www.pcworld.com/article/2149840/voice-phishing-campaign-hits-customers-atdozens-of-banks.html>)

**VoIP** ('vi: 'əʊ 'aɪ 'pi:)

VoIP is short for Voice over Internet Protocol, a category of hardware and software that enables people to use the Internet as the transmission medium for telephone calls (<http://www.webopedia.com/TERM/V/VoIP.html>)

Example: *VoIP systems are being used to support vishing (telephone-based phishing) schemes, which are now growing in popularity.* ([https://en.wikipedia.org/wiki/International\\_cybercrime](https://en.wikipedia.org/wiki/International_cybercrime))

**vulnerability** (vʌlnərə'bɪlɪti)

Weakness or flaw permitting an attack on a computer system or network.  
(<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *Cisco says there is no evidence that this vulnerability has been exploited in the wild, but users are advised to update their installations to protect themselves against potential attacks.*  
(<http://www.securityweek.com/hackers-can-exploit-libreoffice-flaw-rtf-files>)

**watering hole** ('wɔ:tərɪŋ ,həʊl)

A computer attack strategy, in which the victim is a particular group (organization, industry, or region). In this attack, the attacker guesses or observes which websites the group often uses and infects one or more of them with malware. Eventually, some member of the targeted group gets infected. ([https://en.wikipedia.org/wiki/Watering\\_Hole](https://en.wikipedia.org/wiki/Watering_Hole))

Example: *A Chinese attack group infected Forbes.com back in November in a watering hole attack targeting visitors working in the financial services and defense industries, according to two security companies.* (<http://www.securityweek.com/chinese-attackers-hacked-forbes-website-watering-hole-attack-security-firms>)

**XSRF attack** ('ɛks 'ɛs 'ɑ:r 'ɛf ə'tæk )

See **CRSF attack**.

Example: *Forced browsing is an XSRF attack in which a user is forced to browse a content without his/her knowledge.* (<https://programmingmastercoding.blogspot.com.es/2011/05/forced-browsing-attack.html>)

**XXS attack** ('ɛks 'ɛks 'ɛs ə'tæk)

Cross-site scripting attack. Malware injected into a trusted site, presented through a hyperline (<http://news.nicsa.org/2013/08/14/the-vocabulary-of-cyber-crime/>)

Example: *Three websites of the Mexican chapter of Article 19, an international nonprofit organization focused on freedom of expression, were attacked over the course of three days via a Cross-Site Scripting (XXS) attack.* (<https://freedomhouse.org/report/freedom-net/2015/mexico>)

**zombie** ('zɒmbɪ)

(Also “drone”) Unsuspecting computers infected or compromised by a botnet, used to launch distributed denial of service attacks.)

## ENGLISH-RUSSIAN VOCABULARY

### А

- accept- принимать  
access- 1) доступ, 2) проход, подход, 3) выборка информации  
according(to)- соответственно  
active- 1) деятельный, активный; 2) действующий  
add- прибавлять, присоединять  
additional- добавочный, дополнительный  
allow- позволять, разрешать  
appearance- внешний вид, наружность  
append- прибавлять, добивать  
appendix- приложение  
apply- использовать применять  
archive- архив  
arrange- приводить в порядок, систематизировать  
assign- назначать, определять  
attach- прикреплять, присоединять  
attempt- 1) попытка 2) пытаться  
attribute- свойства  
avoid- избегать

### В

- backslash- обратная косая черта  
back-up - дублирование  
basic - основной, главный  
batch - 1) ряд, партия 2) группа, серия  
belong - принадлежать  
blink - мерцание



boot - осуществить первоначальную загрузку  
bootable - способный выполнить первоначальную загрузку  
break - прерывать  
buffer - 1) буфер 2) промежуточная область памяти  
bug - ошибка, дефект, помеха  
build - строить  
build into - встраивать

## С

cable - кабель, провод  
capital - заглавная буква  
carry on - продолжать  
carry out - выполнять  
cause - вызывать, быть причиной  
caution - 1) осторожность 2) предосторожность  
chain - последовательность, цепь  
change - заряд, заряжать  
check - проверять  
choice - выбор  
circular - круглый  
clear - 1) чистый 2) очищать  
close - закрывать  
cluster - 1) группа 2) кластер, пакет, блок  
code - 1) код 2) программа 3) кодировать  
combine - объединять, комбинировать  
compare - сравнивать  
compatible - совместимый  
complete - полный, законченный  
completely - современно, полностью  
compute - вычислять  
connect - соединять

conserve - сохранять  
consist (of) - состоять (из)  
consistent - последовательный, совместный  
console - 1) кронштейн 2) пульт  
contain - содержать в себе  
contents - содержимое  
contiguous - смежный, соприкасающийся  
continue - продолжать  
control - управление, контроль, регулировать  
cord - шнур  
correct - правильный  
correspond - соответствовать  
cover - покрывать  
current - 1) текущий 2) течение, ток

## **D**

deal - заниматься чем-либо, иметь дело  
debug - устранять неполадки, неисправности  
define - определять  
delete - стирать  
deny - отрицать, отказываться  
design - проектировать, предназначать  
destination - назначение  
destination disk - диск, на который ведется запись  
destroy - разрушать  
differ - отличаться, разлагать  
direct - руководить, направлять  
directory - директория  
default directory - директория, имя которой можно не указывать  
disk - диск  
blank disk - гибкий диск

double-density disk - диск с удвоенной плотностью

double-sided disk - двусторонний диск

master disk - диск оригинал

MS DOS installed disk - инсталляционный диск для установки  
операционной системы

single-sided disk - диск, с которого осуществляется копирование

write-protected disk - диск, защищенный от записи

divide - разделять

drive - дисковод

default drive - дисковод используется по умолчанию

external floppy disk drive - внешний дисковод

internal floppy disk drive - встроенный дисковод

drive identifier - идентификатор дисковода

## Е

echo - отображение выполненных команд на экране

edit - редактировать

editor - редактор

embedded - встроенный, включенный

empty - пустой

encounter - встречаться

entire - полный, целый, весь

equal - одинаковый

error - ошибка

disk error writing - ошибка допущенная при записи данных на диск

disk error reading - ошибка, допущенная при считывании

divide error - ошибка, допущенная при делении

escape - выход из текущего режима

exceed - превышать

except - кроме

except for - за исключением

executable - выполнимый  
executive - исполнительный  
extend - расширять, продлить  
extension, file extension - расширение имени файла  
extra - добавочный  
extremely - крайне, чрезвычайно

## **F**

fail - потерпеть неудачу  
failure - отказ, сбой  
fast - быстро  
file - файл  
batch file - файл, содержащий группу команд  
finite -ограниченный  
fit - соответствовать  
fix - укреплять, закреплять  
floppy - гибкий  
follow - следовать  
font - шрифт  
format - 1)формат, 2)форматировать

## **H**

halt - остановка  
handle - управлять, оперировать  
handler - программа обработки  
handy - удобный  
hard - жесткий  
harm - вред, ущерб

hide - прятаться

hold - держать

## I

identify - идентифицировать

illegal - недопустимый

include - включать, содержать в себе

indicate - показывать

initialize - инициализировать, устанавливать в исходное положение

input - 1) ввод информации, 2) информация на входе

insert - вставлять

install - устанавливать

interchangeably - заменяя друг друга

italics - курсив

## J

job - задание, задача, работа

joint - соединяться

## K

keep - иметь, хранить

kind - сорт, разновидность, класс

## L

label - 1) метка, 2) маркировать, различать

leftmost - крайний левый

level - уровень  
link - связь, соединение  
list - список  
locate - устанавливать  
lowercase - нижний регистр

## **М**

manage - руководить, управлять  
menudriven - (программа) управляемая с помощью меню  
message - сообщение  
multilevel - многоуровневый

## **Н**

nest - 1) гнездо, 2) вставлять  
network - сеть  
notation - обозначение  
notch - метка  
numerical – числовой, цифровой

## **О**

occupy – занимать, заполнять  
option - выбор  
optional – необязательный  
order – 1) порядок 2) исправное состояние  
overcome – преодолеть  
overflow – переполнение  
overview - обзор

overwrite – переполнить записью

## **P**

path – тропа, путь к файлу

permit - разрушать

point – точка, пункт

portable – портативный, переносной

portion – часть, доля

power - мощность

powerful – сильный, мощный

press – жать, давить

prevent – предотвращать

previously – предварительно, заранее

primary – первоначальный

prompt – напоминание, подсказка

proper – правильный, надлежащий

protect – защищать

provide – обеспечивать

## **R**

range – диапазон, предмет

rate – норма, скорость, степень

receive – получать, принимать

record – записывать, запись

recover – возвращать, восстанавливать

reload – перезагружать

remainder – остаток

remark – примечание

remove – передвигать  
rename – переименовывать  
repeat – повторять  
replace – заменить  
report – сообщать  
require – требовать, нуждаться  
reserved – запасной, резервный  
reset – перенастроить  
response – 1) ответ 2) реакция  
restart – начинать снова  
return – возвращение  
review – рассматривать

## S

safe – безопасный  
sample – образец, шаблон, модель  
schedule – список, каталог  
select – отбирать  
separate – отделять  
sequence – последовательность  
serial port – разъем  
series – ряд, серия  
session - сеанс работы с системой  
set - устанавливать, назначать  
share - разделять  
shell - оболочка  
shift - сдвиг  
side - сторона  
similar - подобный



skip - пропускать, перепрыгивать  
slash - разрез, косая черта  
specification - спецификация, перечень  
specify - определять  
spot - место  
start-up - 1) начало, пуск, 2) начинать  
string - ряд, последовательность  
substitute - заменять, замещать  
sufficient - достаточный  
support - 1) поддержка, 2) поддерживать  
suspend - приостанавливать  
switch - 1) переключение, 2) переключатель

## **T**

tab - учет  
table - таблица, график  
target - цель  
template - шаблон, модель  
temporary - временный  
term - термин  
terminate - завершать, заканчивать  
track - дорожка  
transfer - перенос, перемещение  
transmit - сообщать, передавать  
turn – поворачиваться ,turn on – включать, turn off - выключать  
in turn - в свою очередь

## **U**

unable - неспособный

unique - уникальный

unless - если не, пока не

unlock - открывать

update - модернизировать

uppercase - верхний регистр

utmost - крайний, предельный

## V

vary - меняться

verify - проверять, контролировать

## **CYBERTERRORISM, COMPUTER AND TECHNOLOGY-RELATED NEWS OF 2020**

### **14 MOST ALARMING CYBER SECURITY STATISTICS IN 2020**

Last updated: September 30, 2020

Rob Mardisalu

I've updated these statistics to reflect 2018 and 2019. If you want to point out any corrections, let me know.

Cyber attacks are growing in prominence every day – from influencing major elections to crippling businesses overnight, the role cyber warfare plays in our daily lives should not be underestimated.

In fact, billionaire investor Warren Buffett claims that cyber threats are the biggest threat to mankind and that they are bigger than threats from nuclear weapons.

We have been compiling a list of relevant cyber-security statistics for you for years now and have decided to update our list with the most alarming cyber security statistics for 2020:

1. Americans are more worried about being a victim of cybercrime than being a victim of violent crime.

Read that again and let it sink in for a minute.

According to a Gallup study, Americans are more worried about cybercrime than violent crimes (including terrorism, being murdered, and being sexually assaulted). Not only are Americans more worried about cybercrime than other crimes, but their worries about cyber crimes has been consistent for about a decade now.

Specially, Americans are more worried about identity theft and being hacked:

- **71 percent** of Americans are worried about having their personal or financial information hacked.

- **67 percent** of Americans are worried about being a victim of identity theft.

By contrast:

- **24 percent** are worried about being a victim of terrorism.
- **22 percent** are worried about being attacked while driving, 20 percent about being sexually assaulted, and 17 percent about being murdered.
- **7 percent** are worried about being assaulted at the workplace.

2. There were more than 1.76 billion records leaked in January 2020 alone.

The year has barely started, but 2020 is on track to be a dangerously interesting year as far as data leaks is concerned.

In January 2020 alone, exactly 1,769, 185,063 user records were leaked. These include records from the famous Collection #1 breach containing user info and plain text passwords for about 772 million people compiled from some of the biggest data breaches to have happened, a MongoDB instance containing 854GB of data that exposed CVs containing sensitive information about 202 million Chinese users, and an Oklahoma government data leak that exposed 7 years of FBI investigations.

3. Ransomware is expected to cost businesses and organizations \$11.5 billion in 2020.

The WannaCry ransomware attack made many people cry in 2017 — including the British National Health Service (NHS). It affected an estimated 200,000 computers in 150 countries and caused damages estimated to be in the billions of dollars. Other popular ransomware attacks include CryptoLocker, CryptoWall, TeslaCrypt, and SamSam.

Ransomware attacks aren't slowing down any time soon. They will cost organizations an estimated \$11.5 billion this year alone — and from individual computer users to governments, nobody is exempt. In fact, just recently, the local government of Jackson County, Georgia, had to pay \$400,000 in ransom

due to a ransomware attack and North Carolina's Orange County experienced its third ransomware attack in six years.

4. Microsoft Office extensions are the most malicious file extensions used by email hackers.

According to data from Cisco's *2018 Annual Cybersecurity Report*, the most malicious file extension used by email hackers in 2018 was Microsoft Office formats. This includes files in the Word, PowerPoint, and Excel formats.

While the .EXE executable file format used to be very popular among hackers, most email service providers now block attachments with these formats due to their tendency to be exploited to distribute Malware. Microsoft Office formats have now taken the top spot for malicious file extensions; these formats are being exploited with the hope of using macros embedded in the documents to evade email security checks and computer antivirus programs.

Cisco's study shows that 38 percent of malicious file extensions are Microsoft Office files. This is followed by archive file formats (.zip and .jar) at 37 percent and PDF files at 14 percent.

5. The main cause of data breaches are malicious or criminal attacks — and they are responsible for 48 percent of all data breaches.

Several factors have been found to be responsible for data breaches. They include:

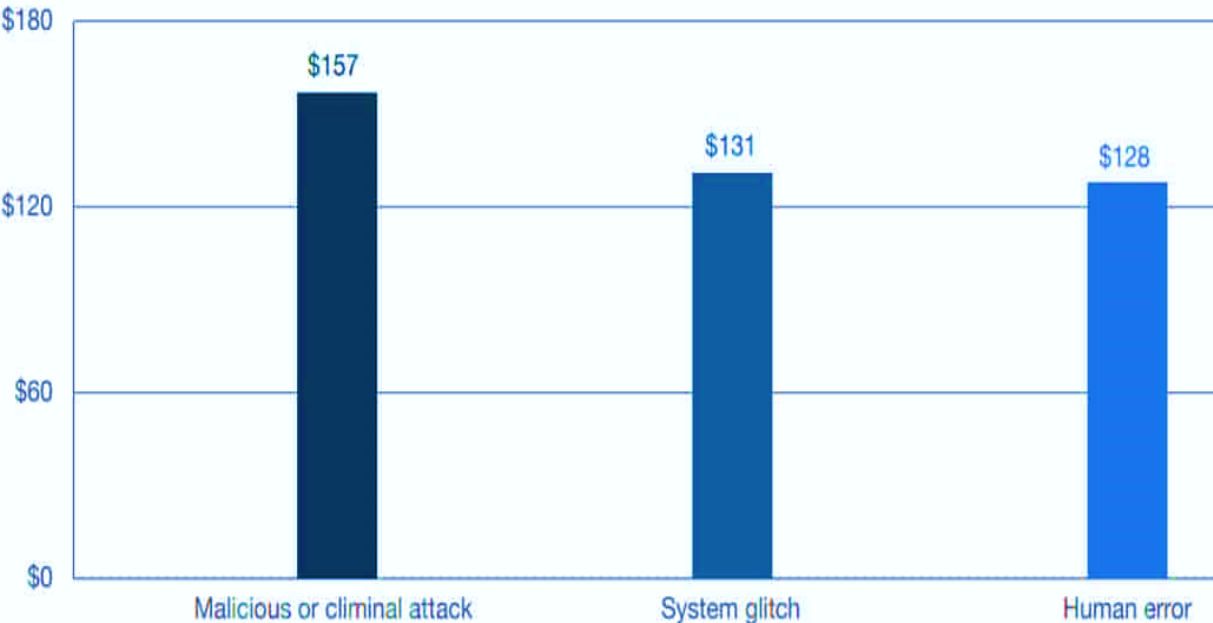
- **Human error (such as negligence on the part of employees or contractors)**
- **System glitches**
- **Malicious or criminal attacks (in which a business was intentionally targeted with malicious intent)**

IBM and Ponemon's Institute's *Cost of a Data Breach Study* found that not only are malicious or criminal attacks the major cause of a data breach, they are also the most costly. According to the study, 48 percent of data breaches are as a result of malicious or criminal attacks (compared to 27 percent for human error and 25 percent for system glitch).

These attacks commonly involve malware infections, SQL injection, phishing/social engineering, and criminal insiders. These attacks generally cost \$157 per user, compared to that from system glitches that costs \$131 per user and that from human error that costs \$128 per user.

Figure 9. Per capita cost for three root causes of the data breach

Measured in US\$



6. The global average cost of a data breach is \$3.6 million — and it keeps increasing every year.

IBM and Ponemon Institute’s *Cost of a Data Breach study* also found that the average cost of a data breach for organizations worldwide is \$3.6 million.

For the 2018 version of the study, IBM and Ponemon Institute interviewed over 2,200 IT, data protection, and compliance professionals from 477 companies that have suffered from a data breach in the past 12 months and found that, *globally*, the average data breach costs \$3.86 million. What is perhaps more worrisome is that this is a 6.4 percent increase from the average cost of a data breach from the previous year. In the U.S., however, data breaches are more costly at an average of \$7.91 million.

7. The global cost of cybercrime is expected to exceed \$2 trillion in 2020.

According to Juniper Research's *The Future of Cybercrime & Security: Financial and Corporate Threats & Mitigation* report, the total cost of cybercrime is expected to exceed \$2 trillion this year. According to Juniper, this is a four-fold increase when compared to the estimated cost of cybercrime in 2015 — just four years ago.

8. Mobile malware is on the rise but “grayware” could pose a more dangerous risk to mobile users.

According to data from Symantec's *2018 Internet Security Threat Report*, mobile malware is on the rise — with the number of new mobile malware variants introduced increasing by a massive 54 percent in one year. This is not helped by the fact that most mobile devices are running on older operating systems (only 20 percent of Android devices are running the newest release).

Despite the rise in mobile malware, a more alarming threat however is that posed by grayware; these are apps that appear to be safe but are rife with issues that put users' privacy at risk. Symantec's study found that 63 percent of grayware apps leak a device's mobile number.

Remember that we recently released a study on how VPN apps ask for dangerous permissions? Specifically, 62 percent of top VPN apps ask for dangerous permissions and will qualify as grayware.

If you're interested in reading more about VPNs, the following links might be valuable for you:

- Top 10 best VPNs that we've reviewed
- What is a VPN?
- How to hide my IP?

9. Cryptojacking is one of the more serious cyber threats to watch out for in 2020.

It's highly unlikely you haven't heard about cryptocurrency in the past few years.

There's a new term you need to add to your vocabulary, however. It's called "cryptojacking."

Cryptojacking is when a hacker hijacks your computer and then uses its CPU power to mine cryptocurrencies.

According to Symantec's *2020 Internet Security Threat Report*, there were four times more cryptojacking events in 2018 than in 2017. Cryptojacking particularly peaked in 2018, and the month of January and February 2018 were particularly noteworthy — with Symantec blocking about 8 million cryptojacking attempts each month.

Cryptojacking will only rise in 2020, particularly as the cryptocurrency market continues to show new signs of life.

10. The number of groups using destructive malware increased by 25 percent in 2018.

Malware attacks is on the rise, but destructive malware more so. Destructive malware are malware that target computer systems with the aim of destroying them and rendering them inoperable.

According to Symantec's *2020 Internet Threat Report*, the number of groups using destructive malware increased by 25 percent in 2018. Notable attacks involving groups that use destructive malware that were exposed in 2018 involved the Thrip group compromising a satellite communications operator and then looking for and infecting computers running software that monitor and control satellites such as MapXtreme, Garmin, and Google Earth Server and the Iran-based Chafer group compromising a Middle East telecoms service provider.



Thrip Attack Group

# Spying on Communications, Mapping and Defense Targets

Wide-ranging espionage operation uncovered using Symantec's new Targeted Attack Analytics tool



## Targeted Sectors



Satellite communications



Mapping/geospatial imaging



Telecommunications



Defense

## Motives



Espionage



Possible disruption

## Tools



Catchamas malware

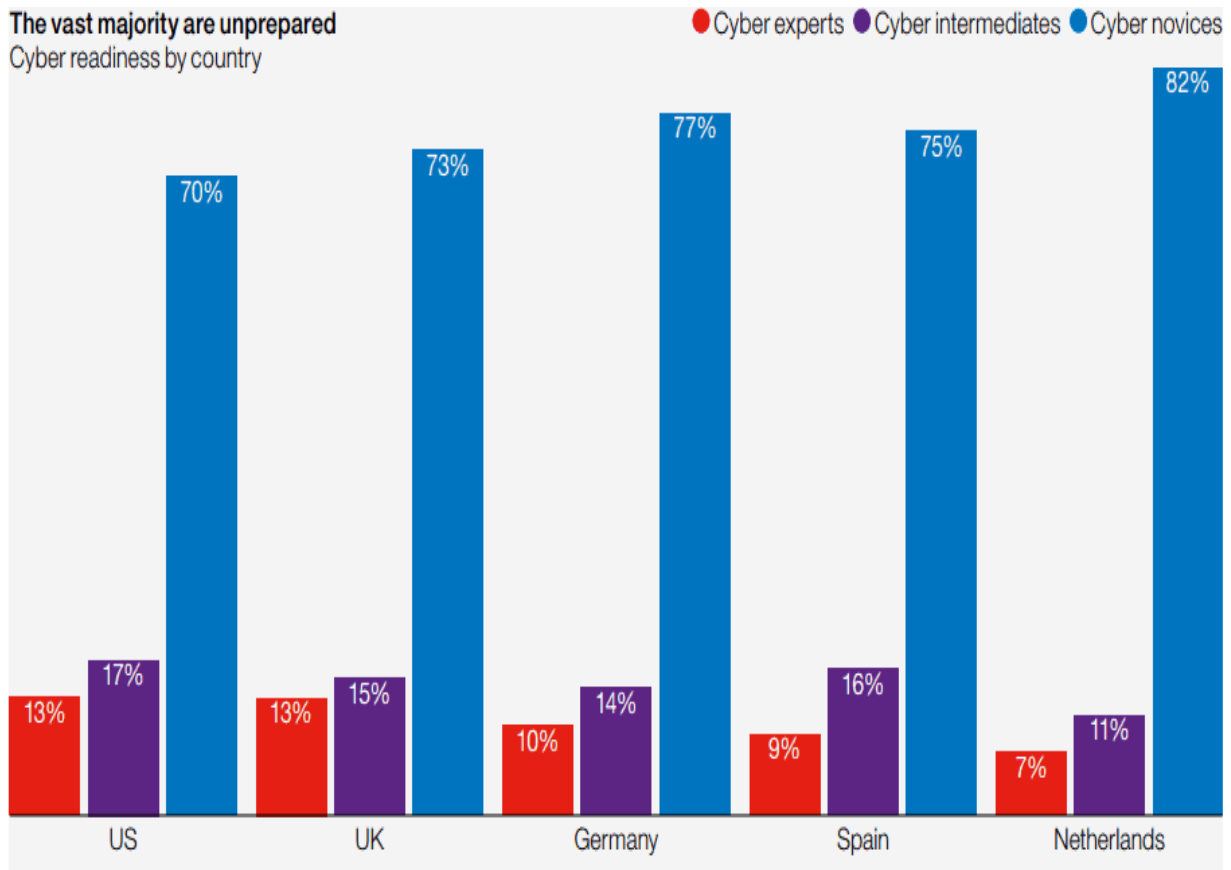


Off-the-shelf administration and penetration testing tools

Symantec. Copyright © Symantec Corporation

## **AROUND 7 OUT OF 10 BUSINESSES ARE NOT PREPARED TO RESPOND TO A CYBER ATTACK.**

We've taken a look at some shocking cyber statistics that show that the average cost of a data breach is in the millions and that malicious attacks are on the rise, yet a whopping 73 percent of businesses are not ready to respond to a cyber attack. This is according to the *2018 Hiscox Cyber Readiness Report*. The study of more than 4,000 organizations across the US, UK, Germany, Spain, and the Netherlands found that most organizations are unprepared (cyber novices) and would be seriously impacted by a cyber attack.



12. Phishing emails are responsible for about 91 percent of cyber attacks.

In most cases, 9 out of 10 successful cyber attacks can be traced to a phishing attempt. This is according to research conducted by PhishMe.

After sending 40 million simulated phishing emails to about 1,000 organizations, PhishMe found that 91 percent of cyber attacks start with a spear phishing email. Worse, these attacks are on the rise.

13. A staggering 92 percent of malware is delivered via email.

Email is a top contender when it comes to cyber attacks, and in line with PhishMe’s study above, according to Verizon’s 2018 Breach Investigations Report, email is responsible for 92 percent of malware.

The 2018 Verizon study that analyzed 53,308 security incidents and 2,216 data breaches in 65 countries found that email is responsible for 92.4 percent of malware while the web is responsible for a measly 6.3 percent.

14. More than 76 percent of cyber attacks are financially motivated.

As the cyberspace gets more sophisticated and intertwined with the real world, the stakes will continue to increase. More cyber attacks, hacks, and data breaches are motivated by financial purposes than anything else.

Verizon's 2018 Breach Investigations Report also found that 76 percent of cyber attacks are motivated by money; most of these attacks (73 percent) are perpetrated by people outside of the organization, with the majority being carried out by organized criminal groups and 12 percent being carried out by nation-state or state-affiliated actors.

### **MAJOR COMPUTER EVENTS IN 2020**

In early February 2020, the outbreak of the COVID-19 coronavirus in China caused significant disruption to the worldwide technology industry.



**COVID-19 cases in China, February 2020**

Google announced the temporary closure of all offices in mainland China, and all Apple stores in China were closed indefinitely. Companies including [Qualcomm](#), [Nintendo](#), and [Facebook Oculus](#) announced major losses in production from their factories located in China. The Chinese government reported a 50% decrease in smartphone sales.

[NVIDIA](#) announced it was acquiring [Arm](#) for \$40 billion on September 13, 2020.

[AMD](#) announced it would be buying [Xilinx](#) for \$35 billion on October 27, 2020.

## COMPUTER AND TECHNOLOGY-RELATED EVENTS IN 2020

On January 1, 2020, U.S. retailers, including Walmart, added a "do not sell my info" option to online customers, complying with the CCPA, a new

Amazon Fire TV



consumer protection law in California. The law grants consumers the right to opt out of the sale of their private information by companies with whom they conduct online transactions.

On January 6, 2020, Amazon announced its Fire TV video streaming devices exceeded 40 million global active users.

On January 14, 2020, Windows 7 reached EOL (end-of-life). On this date, Microsoft ceased providing any support or security updates for Windows 7, and strongly advised users to upgrade to Windows 10.

On January 14, 2020, Microsoft issued an urgent security update for Windows 8 and Windows 10 operating systems, patching a severe security vulnerability discovered by the NSA. The vulnerability allowed third parties to forge digital certificates, and improperly validate malicious software on a Windows computer.

On January 16, 2020, Alphabet, the parent company of Google, joined the "four-comma club," achieving a market valuation over \$1 trillion. The other two members of the club at the time were Apple (\$1.3 trillion) and Microsoft (\$1.2 trillion). The next closest company, Amazon (\$930 billion), briefly joined the club in 2018.

On January 21, 2020, Jeff Bezos, CEO of Amazon, revealed that his personal smartphone was hacked. The revelation spotlighted the severity of security vulnerabilities in mobile devices.

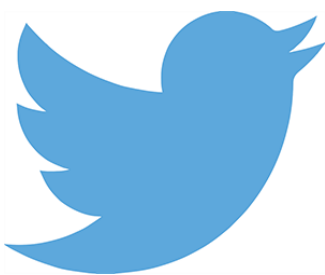
On January 22, 2020, the Microsoft Internet Games service ended for Windows 7.

On January 29, 2020, Facebook agreed to pay \$550 million to settle a class-action lawsuit filed in Illinois regarding facial recognition data collected from users without their consent.

On January 29, 2020, WireGuard was accepted by Linus Torvalds for inclusion in the Linux kernel, marking an important milestone for the software.

Microsoft released a new version of the Microsoft Edge browser in January 2020. The new version is based on Chromium, being more lightweight than the original Microsoft Edge browser, and with features similar to the Google Chrome browser.

On February 3, 2020, an app commissioned by the U.S. Democratic party failed to properly report votes in the Iowa Democratic caucuses. The backup system of two dozen telephone volunteers was massively overwhelmed, and the results of the voting were not made official for several days. The failure of the app drew widespread criticism, and renewed doubts about the reliability of digital voting machines in public elections.



On February 4, 2020, Twitter announced a commitment to detect and label deepfakes, and other deceptive media, on its social media platform.

On February 7, 2020, a major Android vulnerability was announced (CVE-2020-0022). The flaw allowed a nearby attacker to completely take over any mobile device running Android versions 8 or 9 with Bluetooth enabled. Although Android 10 is not affected by this vulnerability, versions 7 and below may be susceptible.

On March 3, 2020, UC Berkeley announced the indefinite hiatus of the SETI@home project, which used volunteer computing to search for extraterrestrial life. However, data continues to be processed on the university's computers.

On March 12, 2020, Twitter announced all of its employees, who had been working remotely from home due to the COVID-19 pandemic, would be allowed to do so indefinitely.

On April 24, 2020, Apple released a revamped version of the original iPhone SE. It features an A13 Bionic processor, 4.7-inch Retina HD display, and Touch ID. It also includes a single, 12-megapixel camera, in contrast to the dual or triple cameras on previous iPhone models.

On July 15, 2020, a hacker used social engineering to gain access to a Twitter employee account that gave them access to all accounts where they interacted with 130 accounts. For 45 accounts, the hacker sent a tweet promoting a cryptocurrency scam. Some of the people and companies on Twitter affected include Apple, Bill Gates, Elon Musk, Jeff Bezos, Joe Biden, President Barack Obama, and Uber.

On October 6, 2020, the U.S. House Judiciary Antitrust Subcommittee released a report detailing monopolistic and anticompetitive behavior by tech giants Amazon, Apple, Facebook, and Google. The subcommittee recommended that Congress structurally separate the companies, and take action that "restores competition, improves innovation, and safeguards our democracy."

On December 8, 2020, FireEye disclosed that their secure systems had been breached by hackers. The security breach was traced to the network infrastructure software Orion, developed by the company SolarWinds. Approximately 500 companies and government organizations were compromised in the attack, which was believed to have been launched by Russian intelligence.

## NEW COMPUTER PRODUCTS AND SERVICES INTRODUCED

### IN 2020



On January 5, 2020, Samsung announced the Q950TS, a bezel-free 8K QLED Smart TV, at CES.

On January 6, 2020, Lenovo announced the Yoga 5G, a 5G-capable laptop, at CES.



On January 8, 2020, AMD announced the Ryzen Threadripper 3990X CPU, featuring 64 cores (or 128 logical cores with hyper-threading enabled) for \$3990, at CES.

On January 8, 2020, founders Meg Whitman and Jeffrey Katzenberg announced video streaming service Quibi (pronounced "KWIH-bee," short for "quick bites"), at CES. Planned for launch on April 6, it offers short-form scripted content that "fits into any moment of your day," created specifically to be viewed on smartphones. The subscription service costs \$4.99/month with advertisements, or \$7.99/month without ads.



Galaxy Z Flip

On February 11, 2020, Samsung unveiled three new smartphones at the *Unpacked* keynote. The Galaxy S20 and S20 Ultra were entries in the Galaxy S series, following the release of the Galaxy S10 in 2019. Also, a foldable phone called the Samsung Galaxy Z Flip was introduced. The Z Flip features a horizontal hinge behind a folding glass screen, allowing the full-sized phone to fold to half its size. The design represents the next iteration of Samsung's foldable screen designs, following 2019's Galaxy Fold.

Samsung announced the Galaxy Z Fold 2 in August 2020.

Google released the Pixel 4a on August 20, 2020.

Android version 11 released on September 8, 2020.

Google released the Pixel 5 on October 15, 2020.

Apple released the iPhone 12 on October 23, 2020.

RIAA filed DMCA claim on October 23, 2020, arguing that YouTube-dl was only used for piracy and forcing GitHub to disable all YouTube-dl repositories. GitHub reinstated YouTube-dl on November 16.

On November 10, 2020, Apple launched the M1, an ARM SoC to be the CPU in its next-generation computers. The first computers to use the M1 were the 2020 models of the MacBook Air, Mac Mini, and 13-inch MacBook Pro. The development marks Apple's departure from Intel CPUs, which were used in Apple computers since January 2006.

Discontinued products and services in 2020

Savefrom.net terminated its service on April 28, 2020.

On June 22, 2020, Microsoft announced the Mixer service would be shut down and merged into Facebook Gaming.

On October 21, 2020, six months after introduced, Quibi announced it would be ending the service.

Adobe ended its support for Adobe Flash on December 31, 2020.

Computer company events in 2020

On February 26, 2020, the startup Clearview AI announced that the 3 billion pictures of people it copied from the Internet had been stolen in a data breach.

T-Mobile completed the \$26.5 billion merger with Sprint on April 1, 2020.

In May 2020, Giphy was purchased by Facebook.

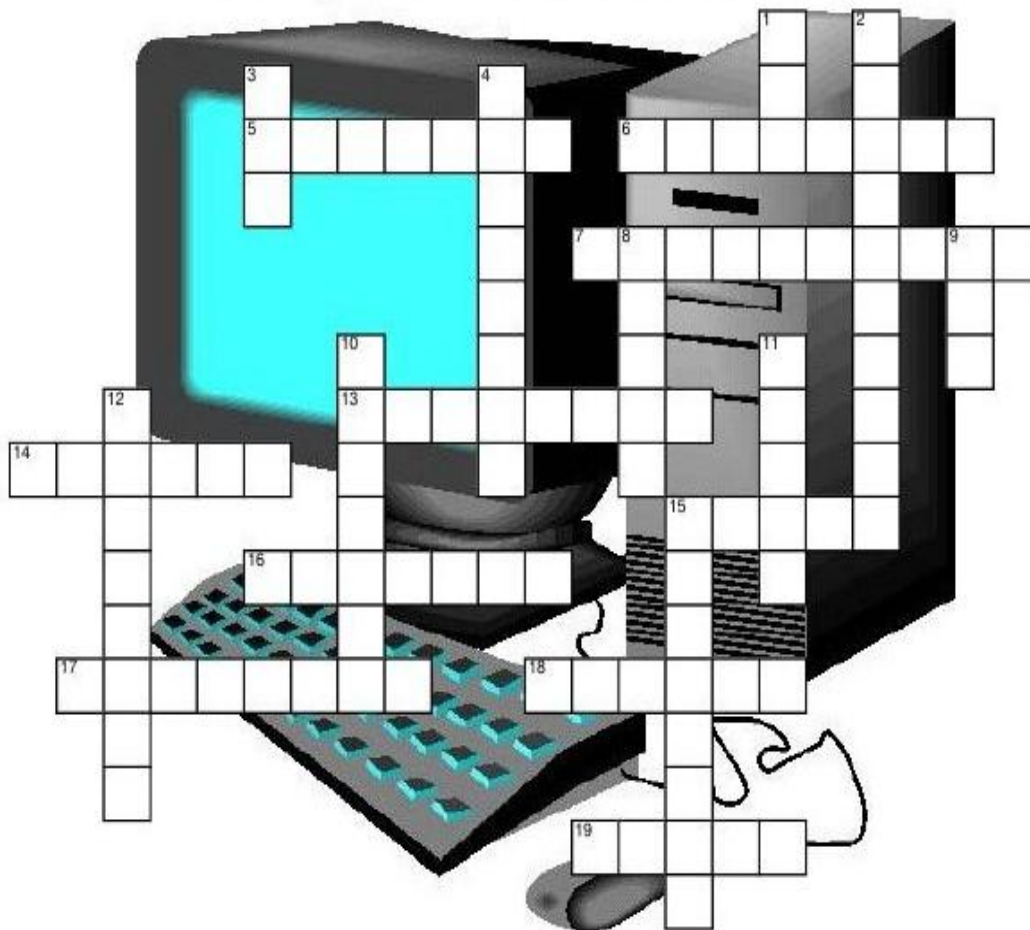
Announced on September 21, 2020, Microsoft acquired ZeniMax Media and its game publisher Bethesda Softworks.

Red Ventures officially acquired CNET Media Group and GameSpot on October 30, 2020.

Salesforce signed a definitive agreement on December 1, 2020, to acquire Slack for approximately \$27.7 billion.



## Computer Parts Word Puzzle



KEYBOARD MOUSE SPELLCHECK VIRUS PAINT MOUSEPAD MONITOR CURSOR  
 EMAIL GOOGLE CPU HARDWARE SOFTWARE FLASHDRIVE USB CHATTING MP3  
 MEGABYTE PRINTER SCANNER

### Across

- 5. the machine that lets you put documents and such on paper
- 6. the tool you use to type words onto the computer
- 7. the program that checks your spelling
- 13. talking to other users by typing or using headphones
- 14. the most popular internet search engine
- 15. what you use to click things on the screen
- 16. what is another word for computer screen
- 17. any physical part of a computer
- 18. the object on your screen that lets you point at things
- 19. internet mail

### Down

- 1. a small port on your computer that you can attach drives to
- 2. a mass storage device that is portable that connects through a USB port
- 3. music form most played on the computer
- 4. one of the many different sizes in regards to computers storage
- 8. a program that lets you draw on your computer
- 9. the brain of a computer
- 10. a machine that lets you put paper documents onto your computer
- 11. a program that destroys your computer system
- 12. any program on the computer
- 15. the object that your mouse sits on

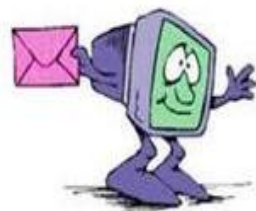
# High Tech Wordsearch



D	Q	T	L	N	Z	F	D	D	I	S	T	M	X	E
N	S	E	I	R	S	A	D	S	C	E	S	A	C	B
E	R	X	A	W	P	V	X	X	B	H	E	R	O	U
I	T	T	M	I	S	L	F	O	M	M	R	G	M	T
R	E	M	E	M	O	A	O	T	L	H	E	A	P	U
F	L	E	S	L	C	K	O	E	K	V	T	T	U	O
B	B	T	P	E	R	O	A	S	L	F	N	S	T	Y
U	A	J	B	E	I	T	U	N	E	S	I	N	E	E
Z	T	O	A	R	E	T	T	I	W	T	P	I	R	N
I	O	D	B	L	U	E	T	O	O	T	H	E	S	O
K	E	K	T	E	P	X	M	N	D	L	L	K	Y	H
R	D	R	H	K	P	B	E	B	M	D	Y	S	R	P
M	R	C	E	J	A	B	A	G	N	P	W	U	O	I
U	Z	H	O	F	K	E	T	I	E	R	M	Z	O	R
K	P	U	Y	W	O	D	K	M	S	U	C	V	C	P



- APP
- BLUETOOTH
- COMPUTER
- EBOOKREADER
- EMAIL
- FACEBOOK
- FRIEND
- INSTAGRAM
- IPAD
- IPHONE
- ITUNES
- KINDLE
- LOL
- PINTEREST
- SKYPE
- SMS
- TABLET
- TEXTME
- TWITTER
- YOUTUBE



# Computer

## Word Search



D	X	O	I	A	O	T	E	M	O	N	I	T	O	R	W	I
C	Q	P	D	A	M	V	T	S	Y	T	X	O	L	K	I	Z
P	U	Y	K	J	V	Y	O	Q	M	L	D	O	S	R	P	M
U	F	C	V	K	K	G	O	C	O	Z	C	S	P	T	O	A
Z	X	B	H	D	H	R	R	O	M	E	O	Z	E	W	I	V
C	L	L	A	P	T	O	P	A	Z	N	N	K	A	J	N	E
B	D	X	Z	N	D	P	B	W	M	C	T	D	K	X	T	P
R	H	T	Y	I	X	W	H	P	J	M	R	Q	E	R	E	A
T	C	A	O	T	N	I	T	M	P	E	O	Y	R	W	R	Z
A	G	T	S	L	M	O	U	S	E	C	L	M	J	N	P	X
B	V	W	A	M	G	G	Z	Q	K	S	L	M	I	Y	M	G
L	S	Q	V	M	I	P	C	Q	P	M	E	B	K	U	C	H
E	F	R	E	G	W	R	L	D	X	M	R	S	O	Y	W	C
T	O	C	X	N	P	E	O	H	L	P	D	O	P	L	C	I
R	X	X	X	S	B	I	U	J	S	Q	T	N	E	B	B	L
J	Y	A	U	H	V	R	D	T	F	R	E	B	O	O	T	V
O	J	H	C	C	C	C	W	G	U	H	M	C	I	H	C	X
F	Q	K	E	Y	B	O	A	R	D	W	Q	K	F	P	O	D
E	M	M	B	D	J	G	C	Q	B	E	J	E	T	B	U	Q
D	R	I	V	E	I	Y	D	Y	J	G	A	M	E	S	Q	Q
W	W	F	T	W	Y	P	Q	E	U	V	P	H	M	Z	N	O
H	U	C	L	R	K	R	S	S	H	U	T	D	O	W	N	C

MOUSE

CPU

MONITOR

POINTER

KEYBOARD

CONTROLLER

LAPTOP

TABLET

SHUTDOWN

SAVE

REBOOT

SPEAKER

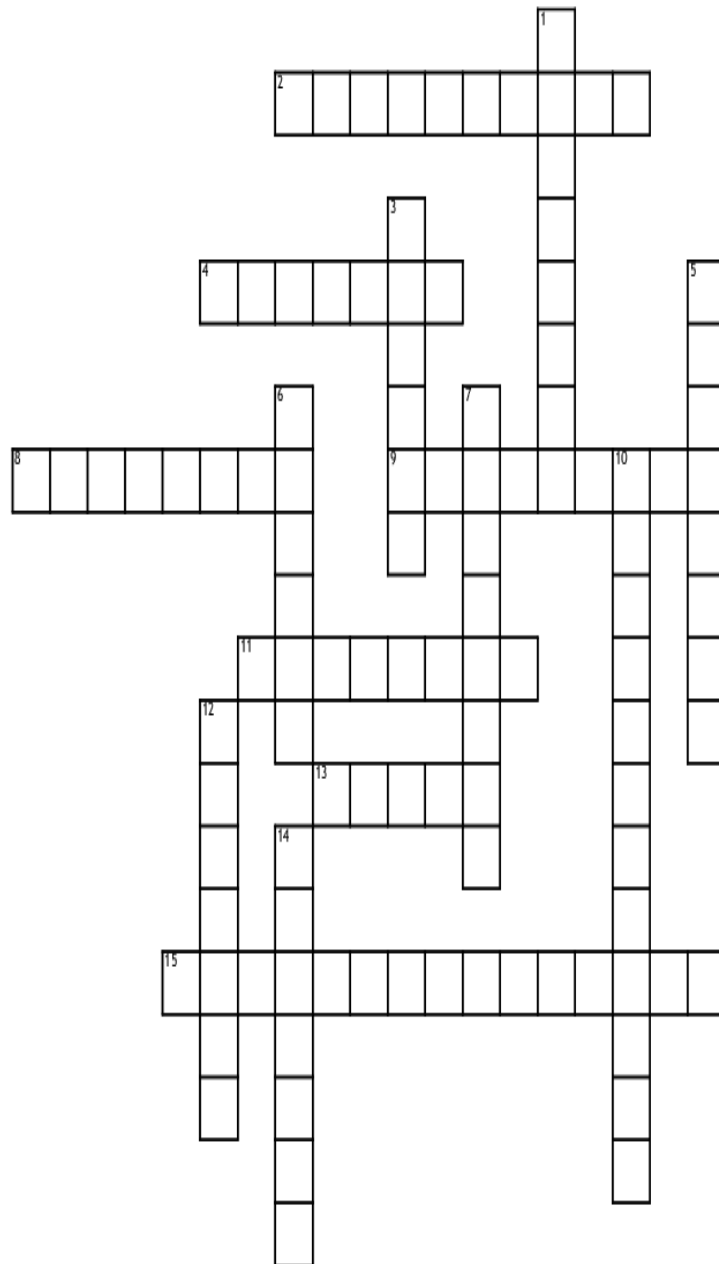
DRIVE

CLOUD

GAMES



# Computer Crossword



## Across

- 2. Scientific knowledge for practical purpose
- 4. collection of instructions
- 8. Protection of data
- 9. Program that allows you to communicate with a computer
- 11. What you use to type stuff on the computer
- 13. Mini computer
- 15. running two or more applications at the same time

## Down

- 1. Stores and processes data
- 3. Network protocol
- 5. Global computer network
- 6. Parts that work together to run a computer
- 7. Connects multiple computer systems to a local area network
- 10. Different features on an iphone (camera, facebook, etc.)
- 12. Distinguishes the real from the fake
- 14. Set of computers connected together to share resources



# COMPUTER PARTS CROSSWORD PUZZLE WORKSHEETS

Do The Crosswords and Write Sentences.

The crossword puzzle grid consists of 19 numbered clues, each with a corresponding illustration of a computer part:

- 1: A vertical tower PC case.
- 2: A green mouse with a cord.
- 3: A CD-ROM disc.
- 4: A microphone on a stand.
- 5: A mouse pad.
- 6: A horizontal mouse pad.
- 7: A vertical mouse pad.
- 8: A pair of red speakers.
- 9: A webcam.
- 10: A black CPU chip.
- 11: A keyboard.
- 12: A blue USB drive.
- 13: A blue CD-ROM drive.
- 14: A green printer.
- 15: A desktop computer monitor.
- 16: A purple mouse.
- 17: A blue game controller.
- 18: A laptop computer.
- 19: A pair of black headphones.

The crossword puzzle grid is a 19x19 grid with the following numbers indicating the starting positions of the words:

- 1: Down, (1,1)
- 2: Down, (1,2)
- 3: Down, (1,3)
- 4: Down, (1,4)
- 5: Down, (1,5)
- 6: Across, (1,6)
- 7: Down, (1,7)
- 8: Across, (1,8)
- 9: Across, (1,9)
- 10: Across, (1,10)
- 11: Across, (1,11)
- 12: Across, (1,12)
- 13: Across, (1,13)
- 14: Across, (1,14)
- 15: Across, (1,15)
- 16: Across, (1,16)
- 17: Across, (1,17)
- 18: Across, (1,18)
- 19: Across, (1,19)

# PARTS OF A COMPUTER

U Y U S H J A H Z R E T N I R P G S H E D K J X  
 N E Y U N E F E V I R D D R A H L A N R E T X E  
 M C G W N C L B Q G A I D E P O L C Y C N E K H  
 Y N S P R N T V N K L E Q V Q M J Q V G L O S A  
 H H J X H L X H Z T Y V R E K A E P S C V D K R  
 D J R H C Z Y R A N O I T C I D O G H G Y S D D  
 B D K Q A A M B A A L R Z X G I G Y M A G C X D  
 L T S K V Q E E Q K M D K N X J Y J J Z B L K R  
 B M Y B X D D Q U L D H R B Y E F Z B Q N R C I  
 K M O D E M I N P I W S G V L W O I E R R T A V  
 Y N W Q W N A S X Q O A T K O D W N J N O U J E  
 P M W B D L G L I M T L B T R T M C T W M Q E S  
 A E Y E I Z Y L N D F F E U N I D U X J M I N N  
 V Q U S X L S D R A O B Y E K N Q R O D B G O T  
 L S D C T Z N M M N M Z A T W U H O Y E I P H H  
 N K C A J S E N O H P D A E H M F J A S C T P M  
 N I V N E D R R Q M C Z C M G E S F R U O Y O O  
 C T V A N B W T E B P O R O F T A P T O N J R N  
 I X T A S K B A R G Y I V E Y S Y B M M S F C I  
 V X E D E S K T O P Z A R H V Y C O E B G V I T  
 G H W I H J V Y C C I X P C I S N J T O Y X M O  
 V K N W R Q U O K Q D V F H P S O O S M H X O R  
 M Y Y E C J C I R Y Y X B Y U Z V B Y K A X O R  
 N T M U L T I M E D I A X L O O U A S S D X V V

HEADPHONES  
 JACK  
 KEYBOARD  
 MODEM  
 TASK BAR  
 DICTIONARY

MICROPHONE  
 JACK  
 SPEAKER  
 PRINTER  
 ICONS  
 MULTIMEDIA

FLASH  
 DRIVE  
 MOUSE  
 MONITOR  
 DESK TOP  
 MEDIA

EXTERNAL  
 HARDDRIVE  
 SYSTEM UNIT  
 SYSTEM TRAY  
 ENCYCLOPEDIA  
 HARD DRIVE

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*Учебное издание*

**КОМПЬЮТЕРНЫЕ ТЕХНОЛОГИИ  
И КИБЕРТЕРРОРИЗМ**

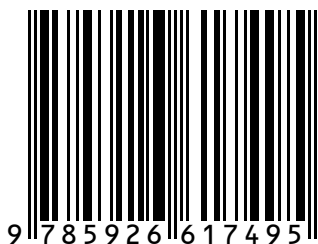
**COMPUTER TECHNOLOGIES  
AND CYBERTERRORISM**

Учебное пособие  
по английскому языку

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