НАЦІОНАЛЬНА АКАДЕМІЯ ПЕДАГОГІЧНИХ НАУК УКРАЇНИ
ДЕРЖАВНИЙ ЗАКЛАД ВИЩОЇ ОСВІТИ
«УНІВЕРСИТЕТ МЕНЕДЖМЕНТУ ОСВІТИ»

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АНГЛІЙСЬКА МОВА ЗА ПРОФЕСІЙНИМ СПРЯМУВАННЯМ

ENGLISH FOR SPECIFIC PURPOSES

Інтерактивний навчально-методичний посібник з англійської мови за професійним спрямуванням для здобувачів фахової передвищої та вищої освіти спеціальності F2 «Інженерія програмного забезпечення»

Interactive Educational and Methodological Manual in English for Specific Purposes for Students of Professional Pre-Higher and Higher Education Specialty F2 «Software Engineering»

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Іноземна мова за професійним спрямуванням: Інтерактивний навчально-методичний посібник з англійської мови для студентів вищих навчальних закладів./Укладач: Дерека К.О.

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Посібник з англійської мови за професійним спрямуванням укладено для здобувачів закладів фахової передвищої та вищої освіти спеціальності F2 «Інженерія програмного забезпечення». Він містить теоретичний і практичний матеріал, призначений для проведення занять у змішаній, дистанційній або очній формах навчання. Матеріали посібника відповідають освітньо-професійній програмі «Розробка програмного забезпечення» галузі знань 12 «Інформаційні технології» та орієнтовані на підготовку здобувачів третього-четвертого курсу.

Різноманітність форм завдань, поданих у посібнику, спрямована на більш глибоке опрацювання навчального матеріалу як під час занять, так і в процесі самостійної роботи. Завдання складено з урахуванням комунікативного підходу, що сприяє розвитку мовленнєвих навичок, збагаченню професійного словникового запасу, а також систематизації та закріпленню набутих знань.

Особливістю посібника є наявність посилань на інтерактивні вправи та онлайн-ресурси, виконання яких підвищує мотивацію здобувачів до вивчення англійської мови за фахом та сприяє формуванню компетентного фахівця у сфері програмної інженерії.

Ключові слова: англійська мова за професійним спрямуванням, інформаційні технології, комунікативний підхід, здобувачі освіти, освітній процес.

The manual in English for Specific Purposes has been developed for students of professional pre-higher and higher education institutions majoring in Specialty F2 «Software Engineering». It contains both theoretical and practical materials intended for use in blended, distance, and face-to-face learning formats. The content of the manual complies with the educational and professional programme «Software Development» within the field of knowledge 12 «Information Technology» and is designed for third- and fourth-year students.

The variety of tasks presented in the manual is aimed at ensuring a deeper understanding of the learning material both during classroom activities and in the process of independent study. The tasks are designed in accordance with the communicative approach, which способствует the development of speaking skills, enrichment of professional vocabulary, and the systematisation and consolidation of acquired knowledge.

A distinctive feature of the manual is the inclusion of links to interactive exercises and online resources. Completing these tasks enhances students' motivation to study English for Specific Purposes and contributes to the formation of competent specialists in the field of software engineering.

Keywords: English for Specific Purposes, information technology, communicative approach, students, educational process.

ЗМІСТ

Unit 1. Computer Engineering as a Discipline. Conditional Sentences

Questions for discussion:

1. What comes to your mind when you hear the word *«computer engineering»*?
2. How is computer engineering different from computer science or information technology?
3. What devices or systems do computer engineers design or work with?
4. Why is programming considered an essential part of computer engineering?
5. How does computer engineering influence everyday life (for example, smartphones, AI, robotics)?

Software **e**ngineering **r**adio **Podcast**

Note the pronunciation of the following:

convergence [kənˈvɜːʤəns]	злиття, конвергенція, поєднання
graduates ['grædjʊəts]	випускники
engineer [ˌɛnʤɪˈnɪə]	інженер
high-tech [ˈhaɪ-tɛk]	високотехнологічний
microelectronics [ˌmaɪkrəʊɪlɛkˈtrɒnɪks]	мікроелектроніка
miniaturization [ˌmɪnɪʧ(ə)raɪˈzeɪʃ(ə)n]	мініатюризація
reliability [rɪˌlaɪəˈbɪlɪti]	надійність
specialization [ˌspɛʃəlaɪˈzeɪʃən]	спеціалізація

Task 1. Read the text and get ready to discuss it in the classroom.

Computer Engineering as a Discipline

Computer engineering is defined as the discipline that embodies the science and technology of design, construction, implementation, and **maintenance of software** and hardware components of **modern computing systems** and computercontrolled equipment. Computer engineering has traditionally been viewed as a combination of both computer science (CS) and electrical engineering (EE). It has evolved over the past three decades as a separate, although intimately related, discipline. **Computer engineering** is solidly grounded in the theories and principles of computing, mathematics, science, and engineering and it applies these theories and principles **to solve technical problems** through the **design of computing hardware**, software, networks, and processes.

Historically, the field of computer engineering has been widely viewed as "designing computers." In fact, the design of computers themselves has been the province of relatively few **highly skilled engineers** whose goal was **to push forward the limits of computer** and microelectronics technology. The successful miniaturization of silicon devices and their increased reliability as system building blocks and complete systems on chips have created an environment in which computers have become pervasive and replaced more conventional electronic devices. These applications manifest themselves in the proliferation of mobile smart phones, tablet computers, multimedia and location-aware devices, **wireless networks**, and similar products.

Increasingly, computer engineers are involved in the design of **computer-based systems** to address highly specialized and **specific application needs**. Computer engineers work in most industries, including the computer, automobile, aerospace, telecommunications, power production, manufacturing, defense, and electronics industries. They design high-tech devices ranging from tiny **microelectronic integrated-circuit chips**, to powerful systems that utilize those chips and efficient telecommunication systems that interconnect those systems. Computer engineers also work on distributed computing environments—local and **wide area networks**, wireless networks, internets, intranets—and embedded computer systems—such as in aircraft, spacecraft, and automobile control systems where they perform various functions.

(From *Computer Engineering Curriculum Guidelines for Undergraduate Degree Programs in Computer Engineering)*

Task 2. Find in the above text English equivalents for the following word combinations and write them out.

невеликі цифрові системи; _____
просувати межі; _____
ця збіжність технологій; _____
вбудовані системи; _____
мікроелектронні кристали інтегральної схеми; _____
у величезному масштабі; _____
забезпечує деякі передумови; _____
як зазначено раніше; _____
міцно обґрунтована у теоріях; _____
величезна кількість складних систем; _____
висококваліфіковані інженери; _____
незліченну кількість додатків; _____
глибоко пов'язаний; _____
як системні стандартні блоки; _____
мініатюризація кремнієвих пристроїв; _____
швидке збільшення кількості мобільних телефонів; _____

фокусовані на додатку проекти; _____
багато можливостей та проблем; _____
початкові навчальні зусилля; _____
обізнані про розташування пристрою. _____

Task 3. Match the professional fields with their main focus:

Field	Focus
1. Software Engineering	a) designing physical computer components
2. Computer Engineering	b) developing programs and applications
3. Information Systems	c) managing data and digital infrastructure
4. Artificial Intelligence	d) creating systems that can «think» or learn

Task 4. Fill in the blank with the correct words.

1. According to the text, which of the following is not considered part of the field of computer engineering?

A. Design of computer hardware
B. Maintenance of software components
C. Implementation of electrical engineering principles
D. Development of new mathematical theories

2. The passage states that computer engineering has evolved over the past three decades as a separate discipline. What is the relationship between computer engineering and the fields of computer science and electrical engineering?

A. Computer engineering is a combination of computer science and electrical engineering.
B. Computer engineering is completely distinct from computer science and electrical engineering.
C. Computer engineering has replaced computer science and electrical engineering as a discipline.
D. Computer engineering is no longer related to computer science and electrical engineering.

3. What is the primary focus of the «relatively few highly skilled engineers» mentioned in the passage?

A. Designing new types of mobile devices
B. Pushing the limits of computer and microelectronics technology
C. Solving specialized application needs through computer-based systems
D. Implementing efficient telecommunication systems

4. The passage discusses the increasing prevalence of computers in various industries. Which of the following industries is not mentioned as one in which computer engineers work?

A. Manufacturing
B. Healthcare
C. Defense

D. Power production

5. According to the passage, what is one way in which the successful miniaturization of silicon devices has impacted the field of computer engineering?

A. It has led to the development of more powerful computer systems.
B. It has reduced the need for highly skilled computer engineers.
C. It has created an environment where computers have become more widespread.
D. It has made the design of computers a more specialized and technical field.

6. The passage mentions that computer engineers work on «distributed computing environments». Which of the following is an example of a distributed computing environment mentioned in the passage?

A. Microelectronic integrated-circuit chips
B. Wireless networks
C. Automobile control systems
D. Powerful computer systems

7. What is the main purpose of the passage?

A. To provide a comprehensive history of the field of computer engineering
B. To outline the various industries in which computer engineers work
C. To describe the key responsibilities and skills of computer engineers
D. To explain the evolution of computer engineering as a distinct discipline

8. What has created an environment where computers have become pervasive and replaced more conventional electronic devices?

A. Decreased reliability
B. Miniaturization of silicon devices
C. Increased cost
D. Lack of demand

1. **Which two disciplines is computer engineering traditionally viewed as a combination of?**

A. Chemical Engineering and Computer Science
B. Computer Science and Electrical Engineering
C. Electrical Engineering and Civil Engineering
D. Computer Science and Mechanical Engineering

2. **What is the main focus of computer engineering?**

A. Designing clothing
B. Designing software applications
C. Designing bridges
D. Designing computing hardware and software

3. **In which systems do computer engineers work on embedded computer systems?**

A. Aircraft and spacecraft
B. Space shuttles
C. Trains
D. Submarines

4. **Where do computer engineers work on distributed computing environments?**

A. Outer space
B. Underground tunnels
C. Underwater
D. Local and wide area networks

5. In which industries do computer engineers work?

A. Automobile and Aerospace
B. Food and Beverage
C. Fashion and Beauty
D. Construction and Real Estate

6. What types of high-tech devices do computer engineers design?

A. Cooking appliances
B. Medical equipment
C. Furniture
D. Microelectronic integrated-circuit chips

Task 5. Fill in the blanks with the words from the box.

applications, computer science, electrical engineering, wireless networks, telecommunications, electronics, integrated-circuit, software and hardware

Computer engineering refers to the field encompassing the science and technology involved in designing, constructing, implementing, and maintaining the _____(1) components of contemporary computing systems. Traditionally, it has been seen as a blend of _____(2) and _____(3) .

Today, computer engineers are increasingly tasked with designing specialized computer-based systems tailored to specific _____(4). They work across various industries such as computer technology, automotive, aerospace, _____(5), manufacturing, defense, and _____(6). Their work spans from creating microelectronic _____(7) chips to developing efficient telecommunication systems that connect these devices. Additionally, computer engineers are involved in distributed computing environments like local and wide area networks, _____(8), as well as embedded computer systems found in aircraft, spacecraft, and automotive control systems, where they fulfill diverse functions.

Task 6. Complete the sentences with the words from the box.

based as well as requirement operating related differ involved

1. Computer engineering is the process of analyzing and designing all hardware, software, and _____ systems for a computer system.
2. Computer science and engineering are often confused as being the same, but these two fields _____ greatly.

3. We must utilize our knowledge and understanding of the design of logic and microprocessor systems, _____ computer architecture and computer interfacing.
4. Many reasons prompt new designs such as seeking to exploit new developments in _____ technologies or to develop improvements on existing products.
5. Computer engineering technologists support engineers by installing and operating computer-_____ products, and maintaining those products.
6. Computer engineers are _____ in many hardware and software aspects of computing, from the design of individual microcontrollers, microprocessors, personal computers, and supercomputers, to circuit design.
7. A key element of this process is a_____ that each program engage in an ongoing process of self-assessment and continuous improvement.

Task 7. Match these words to their definitions.

1.microelectronic integrated-circuit chips	
2. wide area networks	
3. software components	
4. computer engineering	
5. computing hardware	
6. specific application needs	
7. wireless network	

Definitions:

a. the physical components of a computer system, including the central processing unit (CPU), memory, and storage devices.
b. a type of computer network that uses radio waves to connect devices without the need for physical cables.
c. individual programs or modules that make up a larger software system.
d. the unique requirements and demands of a particular software or system.
e. the branch of engineering that deals with the design, development, and maintenance of computer systems and their components.
f. a network that connects computers and devices over a large geographical area, such as multiple buildings or cities.
g. small electronic components made up of interconnected circuits on a single piece of material, used in many electronic devices.

Task 8. Scan Qr-code and do the Quiz in https://quizizz.com/ program.

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Task 9. Rephrase these sentences using the phrases from the box.

software components; wireless network; computing hardware, computer engineering; wide area network

1. I connected my phone to the WiFi at the coffee shop.
2. The company uses a WAN to connect all of its offices.
3. The IT department is responsible for maintaining the computer hardware.
4. The components of the new program need to be updated.
5. Computer engineering requires a strong foundation in math and science.

Grammar. Conditional Sentences

Conditional sentences (умовні речення) описують ситуації, які залежать від певної умови. У сфері комп'ютерної інженерії вони часто використовуються для опису причинно-наслідкових зв'язків у програмуванні, роботі комп'ютерних систем, розробці програмного забезпечення тощо.

Zero Conditional (Нульовий тип)

Використовується для опису загальних фактів, законів природи, правил, інструкцій.

- If you **press** this key, the program **runs** automatically.
- If the code **contains** errors, the compiler **shows** a message.
- If the system **overheats**, it **shuts** down.

Use: для опису ситуацій, які завжди правдиві в галузі комп'ютерної техніки чи програмування.

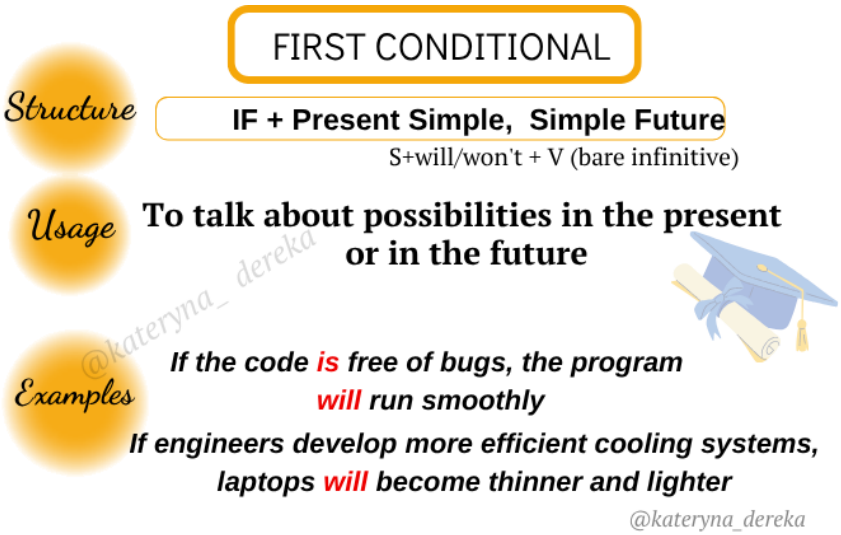
First Conditional (Перший тип)

Використовується для реальних або можливих ситуацій у майбутньому.

- If you **install** the latest update, the system **will work** faster.
- If the server **crashes**, we **will lose** the connection.
- If developers **fix** the bug, the application **will run** smoothly.

Task 10. Scan Qr-code and watch the presentation about Conditional Sentences in service https://www.canva.com.

Use: для вираження можливих наслідків у професійній діяльності програміста чи інженера.



Task 11. Complete the sentences, using Conditional First.
(Use the correct form of the verbs in brackets.)

1. If you _____ (update) your antivirus software, your computer _____ (be) better protected.
2. The system _____ (crash) if you _____ (not save) your work regularly.
3. If developers _____ (fix) this bug, users _____ (download) the app more often.
4. If we _____ (add) more RAM, the system _____ (run) faster.
5. If you _____ (forget) your password, the administrator _____ (help) you recover it.
6. If the network _____ (be) down, we _____ (not be able) to access the server.
7. The program _____ (generate) an error if you _____ (enter) the wrong command.
8. If we _____ (complete) the project on time, our team _____ (get) a bonus.
9. If the database _____ (not update) properly, the website _____ (show) outdated information.
10. If you _____ (click) on this link, the system _____ (open) the registration page.

Task 12. Conditional Sentences Type 0 and Type 1.
(Use the correct form of the verbs in brackets.)

1. If a processor _____ (overheat), the system automatically _____ (shut down).
2. If you _____ (not save) your file, you _____ (lose) your work.
3. If an algorithm _____ (contain) an error, the program _____ (not give) the correct output.
4. If you _____ (connect) the printer correctly, it _____ (work) without problems.

5. If the battery _____ (be) fully charged, the laptop _____ (run) for several hours.
6. If you _____ (press) this button, the computer _____ (start) the installation process.
7. If a user _____ (enter) a wrong password three times, the account _____ (lock) automatically.
8. If the Wi-Fi signal _____ (be) weak, the connection speed _____ (drop).
9. If the system _____ (detect) a virus, it _____ (display) a warning message.
10. If you _____ (use) outdated software, you _____ (risk) a security problem.

Computer Engineering as a Discipline

Term	Definition / Explanation
Computer engineering	A branch of engineering that combines computer science and electrical engineering to design, build, and maintain hardware and software systems.
Discipline	A specific field of study or branch of knowledge, such as computer engineering or mathematics.
Hardware	The physical components of a computer system — such as the processor, memory, motherboard, and circuits.
Software	The programs and operating information that tell a computer how to perform tasks.
Implementation	The process of putting a design, plan, or system into action — in IT, it means making a program or system work.
Maintenance	The work of keeping computer systems and software functioning efficiently through updates and repairs.
Computer-controlled equipment	Machines or devices operated automatically by computer systems (e.g., robots, CNC machines, drones).
Electrical engineering (EE)	The branch of engineering that studies and applies electricity, electronics, and electromagnetism.
Computer science (CS)	The study of algorithms, programming, data structures, and software development principles.
Microelectronics	The study and manufacture of very small electronic components used in circuits and chips.

Term	Definition / Explanation
Miniaturization	The process of making electronic components smaller while increasing their performance.
Integrated-circuit chip	A small electronic device that contains many miniaturized circuits used to perform computing functions.
Embedded system	A computer system built into a larger device to perform specific control functions (e.g., in cars, airplanes, or appliances).
Distributed computing	A model where computing tasks are shared across multiple connected computers or networks.
Wireless network	A computer network that connects devices without physical cables, using radio waves or other wireless signals.
Telecommunications	The technology of transmitting information over long distances, such as through phones, internet, or satellites.
Reliability	The ability of a system or device to perform its required functions consistently and without failure.
System design	The process of defining the architecture, components, and interfaces of a computer or network system.
Application needs	Specific requirements that a software or hardware solution must meet for a particular purpose or industry.

Unit 2. What is a Computer Second Conditionals

Questions for discussion:

1. What do you use a computer for every day?
2. What parts of a computer do you know?
3. How do you think a computer “understands” what to do?
4. What’s the difference between hardware and software?
5. Can a computer think on its own? Why or why not?

Task 1. Scan Qr-code and practise new words and phrases in https://quizlet.com.

VOCABULARY Practise the following words and word combinations.

intricate ['intrikit]	складний, заплутаний
electronic circuit	електронна схема
to operate switches	керувати перемикачами
to store numbers	зберігати числа
to manipulate [mə'nɪpjuleɪt]	обробляти, маніпулювати
to input / to feed in	*вводити (дані)*
to turn on = to switch on	УВІМКНУТИ
to turn off = to switch off	вимкнути
to process data	обробляти дані
to supply	постачати, забезпечувати
addition	додавання
subtraction [səb'trækʃn]	віднімання
division	ділення
multiplication ['mʌltɪplɪ'keɪʃn]	множення
exponentiation	піднесення до степеня
user	користувач
input device	пристрій введення
disk drive	дисковод
to make decisions	приймати рішення

Task 2. Read and translate the text.

What is a computer?

A **computer** is a machine with an intricate network of electronic circuits that operate switches or magnetize tiny metal cores. The switches, like the cores, are capable of being in one or two possible states, that is, on or off; magnetized or demagnetized. The machine is capable of storing and manipulating numbers, letters, and characters (symbols).

The **basic idea of a computer** is that we can make the machine do what we want by inputting signals that turn certain switches on and turn others off, or magnetize or do not magnetize the cores.

The **basic job of computers** is **processing of information**. For this reason computers can be defined as devices which accept information in the form of instructions, called a **program**, and characters, called **data**, perform mathematical and / or logical operations on the information, and then supply results of these operations. The **program**, or part of it, which tells the computers what to do and the data, which

provide the information needed to solve the problem, are kept inside the computer in a place called **memory**.

Most computers have three basic capabilities

First, computers have circuits for performing **arithmetic operations**, such as: addition, subtraction, division, multiplication and exponentiation.

Second, computers have a means of communicating with the user. After all, if we couldn't feed information in and get results back, these machines wouldn't be of much use.

Third, computers have **circuits** which can make decisions. The kinds of decisions which computer circuits can make are not of the type: "Who would win the war between two countries?" or "Who is the richest person in the world?" Unfortunately, the computer can only decide three things, namely:

- Is one number less than another?
- Are two numbers equal? and,
- Is one number greater than another?

A computer can replace people in dull, routine tasks, but it works according to the instructions given to it.

Task 3. Translate the phrases into English.

Складна мережа електронних ланцюгів	
управляти (приводити в дію) перемикачами	
можливі стани	
зберігати (запам’ятовувати) числа	
оброблювати символи	
за допомогою вводу сигналів	
включати - виключати	
розмагнічувати серцевини	
обробка інформації	
інформація у вигляді команд	
символи, які називаються дані	
здійснювати математичні операції	
видавати результати	
забезпечувати необхідну інформацію	
основні властивості	
додавання - віднімання	
ділення - множення	
піднесення до степеня	

засоби для спілкування з користувачем	
приймати рішення	
здійснювати тисячі логічних операцій	
нудна рутинна робота	
у відповідності з введеною програмою	

Task 4. Answer the questions.

1. What is a computer?
2. What are the main functions of a computer?
3. In what way can we make the computer do what we want?
4. What is the basic task of a computer?
5. In what form does a computer accept information?
6. What three basic capabilities have computers?

Task 5. Arrange the following words in pairs according to the similar meaning (synonyms).

A. to perform, to exercise, to carry out; B. a man, a person, a human being;

Verbs: to turn on, to provide, to type, to accept, to help, to learn, to observe, to call, to tell, to keep, to feed, to solve, to relate, to switch off, to communicate, to receive, to supply, to switch on, to assist, to print, to study, to input, to turn off, to decide, to store, to say, to name, to watch.

Nouns: work, machine, fundamentals, display, application, capabilities, job, storage, screen, state, basics, use, concept, specialist, journal, character, memory, idea, expert, magazine, position, symbol, command, data, solution, device, instruction, powers, information, decision.

Adjectives: basic, tiny, common, small, main, significant, routine, general, remarkable, uninterested, intricate, important, wonderful, complex, little.

_____
_____
_____

Adverbs: rapidly, probably, instantaneously, in a moment, quickly, perhaps.

_____
_____
_____
_____

Task 6. Choose the correct answer.

1. Information is given into the computer in the form of _____.
   a) ideas; b) characters; c) rules
2. The basic function of a computer is _____ information.
   a) to switch; b) to keep; c) to process
3. The data needed for solving problems are kept in the _____.
   a) memory; b) input device; c) output device
4. Inputting information into the computer is realized by means of _____.
   a) a printer; b) letters; c) diskettes
5. A computer can carry out arithmetic-logical operations _____.
   a) quickly; b) instantaneously; c) during some minutes
6. Computers have become _____ in homes, offices, research institutes.
   a) commonwealth; b) commonplace; c) common room
7. Space _____ uses computers widely.
   a) information b) production c) exploration
8. Computers are used for image _____.
   a) processing b) operating c) producing
9. Computers help in _____ of economy.
   a) environment b) management c) government
10. Air traffic control depends on computer-_____ information.
    a) generated; b) instructed; c) combined

Task 7. Choose the correct answer.

1. Computer	a) a machine by which information is received from the computer;
2. Data	b) a device capable of storing and manipulating numbers, letters and characters;
3. Input device	c) an electronic machine that processes data under the control of a stored program;
4. Memory	d) a disk drive reading the information into the computer;
5. Output device	e) information given in the form of characters.

1	2	3	4	5

Task 8. Answer the questions. Choose the correct answer.

1. **What are the two possible states that switches or metal cores in a computer can be in?**
   A. Blue or red; green or yellow
   B. Fast or slow; big or small
   C. On or off; magnetized or demagnetized
   D. Hot or cold; wet or dry
2. **What is the role of electronic circuits in a computer?**
   A. Storing food items
   B. Creating art pieces
   C. Operating switches and magnetizing metal cores
   D. Controlling the weather
3. **What is the main difference between a computer's capabilities and human decision-making?**
   A. Humans can perform arithmetic operations faster
   B. Computers can make emotional decisions
   C. Humans can communicate with machines better
   D. Computers follow instructions, while humans have free will
4. **What kind of decisions can computer circuits make?**
   A. Predicting the future
   B. Deciding who wins a sports game
   C. Determining if one number is less than another
   D. Choosing the best movie of the year
5. **What are the three basic capabilities of most computers?**
   A. Cooking, cleaning, and gardening
   B. Performing arithmetic operations, communicating with the user, making decisions
   C. Singing, dancing, and painting
   D. Flying, swimming, and running
6. **What is the relationship between a computer's input and its output?**
   A. Output determines input
   B. Input determines output
   C. Input affects output, but output does not affect input
   D. They are unrelated
7. **What is the basic idea of a computer?**
   A. Performing physical tasks
   B. Storing and manipulating numbers, letters, and characters
   C. Playing music
   D. Generating random outputs
8. **What is the basic job of computers?**
   A. Cooking meals
   B. Processing information

C. Playing games
D. Driving cars

9. **Where is the program and data stored inside a computer?**
   A. In the processor
   B. In the keyboard
   C. In the monitor
   D. In the memory
10. **Where are the instructions for a computer stored?**
   A. In the monitor
   B. In the keyboard
   C. In the mouse
   D. In the memory

Task 9. Match the words with their meanings:

1. to process data
2. to store information
3. to input data
4. to make decisions
5. electronic circuit
6. to switch on/off
7. user
8. memory

Meanings:
a) a person who operates a computer
b) to enter data into a computer
c) to keep data for future use
d) to turn a device on or off
e) a network of electronic components that carries electric current
f) to handle or work with information
g) to reach a conclusion after processing information
h) a part of a computer where data and programs are stored

Task 10. Read the text. Think about its title. Write out new terms and find their definitions in the dictionary. Write them too. Then make a word-cloud in https://wordart.com/ with these definitions.

Informed citizens of our information-dependent society shoud be computer-literate, which means that they should be able to use computers as everyday problem-solving devices. They should be aware of the potential of computers to influence the quality of life.

At present a great deal of the work force of most countries is engaged in creating, processing, storing, communicating and just working with information. Computers have become commonplace in homes, offices, stores, schools, research institutes, plants.

The use of computers in business, industry and communication services is widespread today. Computer-controlled robots are able to improve the quality of manufactured products and
to increase the productivity of industry. Computers can control the work of power stations, plants and docks. They help in making different decisions and in management of economy.

The work of banks depends upon computer terminals for millions of daily operations. Without these terminals, records of deposits and withdrawals would be difficult to maintain, and it would be impossible to make inquiries about the current status of customer accounts.

Computers form a part of many military systems including communication and fire control. They are applied for automatic piloting and automatic navigation. Space exploration depends on computers for guidance, on-board environment and research.

New defititions:

_____

_____

_____

_____

_____

_____

_____

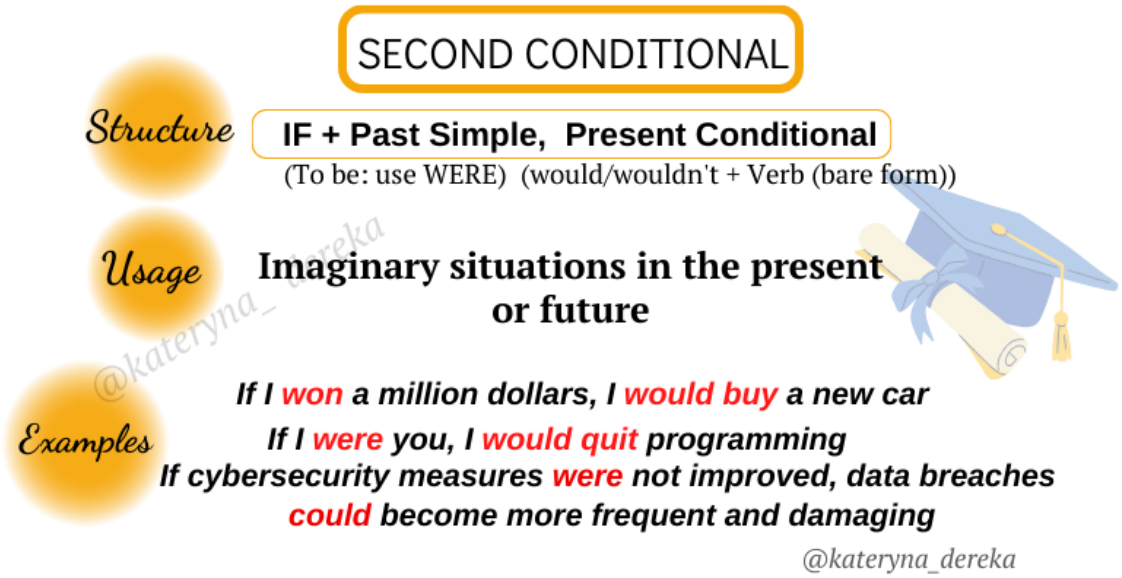
Sentences of Unreal Condition referring to the present or future

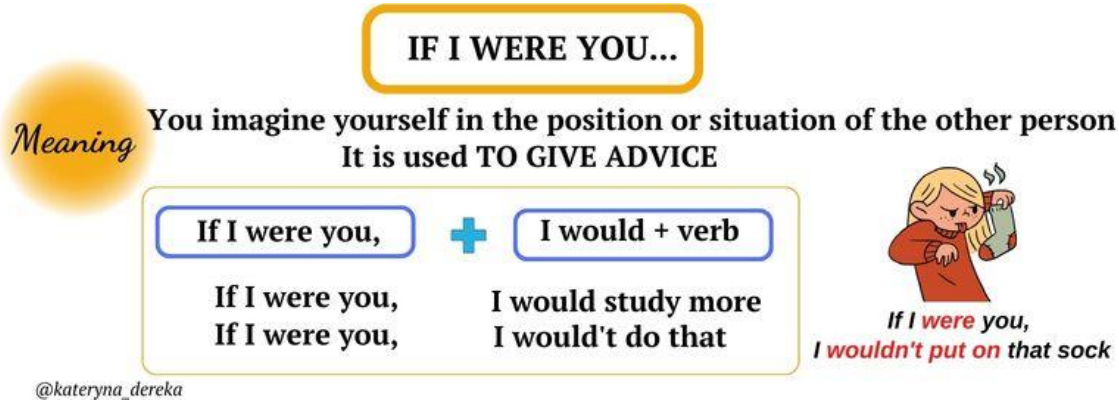
Second Conditional

Використовується для малоймовірних або уявних ситуацій у теперішньому чи майбутньому.

- If I **had** more RAM, my computer **would run** simulations faster.
- If the company **used** AI more effectively, it **would increase** productivity.
- If we **knew** the source code, we **would fix** the problem easily.

Use: для припущень або гіпотетичних ситуацій у сфері IT.





	Use	*If* clause (condition)	,	main clause (result)
Type 2	To talk about **present** or **future hypothetical** or **unreal** situations	**Past (simple, continuous,)** If something happens… 1. *If I **won** the lottery…* 2. *If you **weren't talking**…* 3. *If I **were** you…*	,	**would /could / might + infinitive** … the result would be true *1. …I **would buy** a watch* *2. … I **could concentrate.*** *3. …I **might wait before taking a decision.***

Task 10. Put the verbs in brackets in the right form. Conditional Sentences Type 2.

(Use the correct form of the verbs in brackets.)

1. If I _____ (have) more programming experience, I _____ (apply) for the software engineer position.

2. If the system _____ (not require) so much memory, it _____ (run) on older computers.
3. If our team _____ (know) the source code, we _____ (fix) the bug faster.
4. If you _____ (use) a better compiler, the code _____ (compile) more quickly.
5. If the company _____ (invest) more in AI, it _____ (develop) smarter applications.
6. If I _____ (be) a hardware designer, I _____ (create) more energy-efficient chips.
7. If users _____ (not store) their data in the cloud, they _____ (risk) losing important files.
8. If we _____ (have) a faster internet connection, we _____ (test) our app remotely.
9. If the project _____ (be) smaller, we _____ (finish) it within a week.
10. If the database _____ (contain) fewer records, the system _____ (load) faster.

Task 11. Rewrite the Sentences using Second Conditionals.
Conditional Sentences – Type 2 (Unreal / Hypothetical Situations)
(Complete the sentences with the correct form of the verbs in brackets.)

1. If I _____ (be) better at mathematics, I _____ (understand) computer architecture more easily.
2. If our college _____ (have) more modern labs, students _____ (be able) to design advanced robots.
3. If the processor _____ (work) faster, the whole system _____ (perform) better.
4. If the company _____ (not depend) on outdated software, it _____ (increase) productivity.
5. If we _____ (know) how the malware spreads, we _____ (prevent) the attack.
6. If you _____ (use) Linux, you _____ (learn) more about open-source systems.
7. If the engineer _____ (have) more time, he _____ (develop) a more efficient algorithm.
8. If programmers _____ (earn) higher salaries, more people _____ (choose) this career.
9. If my computer _____ (not be) so old, I _____ (install) the latest IDE.
10. If artificial intelligence _____ (control) traffic systems, there _____ (be) fewer accidents.

Task 12. Match 1-6 with a-f and make second conditional sentences using the correct form of the verbs in brackets.

1. If I _____(need) money, _____
2. If tablet computers _____ (not cost) so much, _____.
3. I _____ (be) upset _____
4. I _____ (can) buy clothes really cheaply _____

5. If I _____ (have) a credit card, _____
6. If I _____ (not have) a mobile phone, _____
   a I _____ (ask) my dad to buy one for me.
   b I _____(can) shop online.
   c if I _____ (shop) at the charity shop.
   d I _____ (get) a holiday job.
   e I _____ (use) my mum's laptop to send messages.
   f if the coffee shop in my village _____ (close).

Task 13. Complete the second conditional sentences with the correct form of the verbs in brackets.

1. I_____ (do) more homework if I_____ (spend) less time online.
2. If children_____(not watch) TV so much, they_____ (be) healthier.
3. If a big rock_____(hit) the Earth, it_____ (cause) a huge explosion.
4. Global warming_____ (slow) down if people_____(change) their lifestyles.
5. If you_____(apply) for a job at the hotel, I'm sure you_____(get) it.
6. If you_____ (visit) Rome, you_____ (can) see the Trevi Fountain.
7. If I_____ (want) to become a millionaire, I_____ (start) my own business.

Task 14. Scan Qr-code and do the task.

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Task 15. Rewrite these sentences using the second conditional.

1. My job is repetitive. That's why I don't enjoy it.

If my job wasn't repetitive, I'd enjoy it. OR *I'd* **enjoy my job if it wasn't repetitive.**

2. She doesn't like swimming. That's why she doesn't go to the pool.

_____

3. He doesn't earn a lot of money. That's why he doesn't rent an apartment on his own._____

4. The Louvre Museum is crowded. That's why I don't like it.

_____

5. We won't go on holiday this year. We can't afford it.

_____

Task 16. Complete the second conditional sentences with the correct form of the verbs below.

Be	**can**	**feel**	**have**	**help**	**not stay up**	**not take**	**win**

1. If you had a problem, I _____ _____ you.
2. If I _____ more time, I'd see more of my friends.
3. I _____ the bus to school if I had a bike.
4. If you _____ so late, you wouldn't be so tired in the morning.
5. How _____ you_____ if Sam didn't invite you to his party?

6. My parents _____cross if I didn't revise for my exams.
7. You_____ afford a new mobile if you didn't waste your money on DVDs and games.
8. If I_____ the lottery, I'd buy my mum a new car.

Task 17. Choose the correct option – Type 1 or Type 2

1. If you (don't back up / didn't back up) your data, you (will lose / would lose) it.
2. If I (had / have) more free time, I (will learn / would learn) a new programming language.
3. If the system (detects / detected) a virus, it (will warn / would warn) the user.
4. If our company (used / uses) renewable energy, it (will reduce / would reduce) electricity costs.
5. If I (were / am) good at robotics, I (will design / would design) my own drone

Task 18. Scan Qr-code and do the task.

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GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
Computer	An electronic device that can store, process, and output data according to a set of instructions (a program).
Electronic circuits	A network of electrical components (such as resistors, transistors, and capacitors) that control the flow of electric current to perform operations.
Switch	A small device in a circuit that can be in one of two states: *on* (current flows) or *off* (no current).
Core (magnetic core)	A small magnetic element used in older computers to store data by being magnetized or demagnetized.
State (on/off)	The condition of a circuit or switch, showing whether current is flowing (*on*) or not (*off*).
Symbol	A letter, number, or character that represents data processed by a computer.
Input	The process of entering data or instructions into a computer.
Output	The process of getting information or results from a computer after processing.

Term / Expression	Definition / Explanation
Processing of information	The computer's main task — performing operations on data according to instructions.
Program	A set of instructions that tells the computer what to do step by step.
Data	Information (numbers, text, symbols) entered into a computer for processing.
Memory	The part of the computer where programs and data are stored temporarily or permanently.
Arithmetic operations	Basic mathematical actions — addition (+), subtraction (−), multiplication (×), division (÷), exponentiation (^).
Logical operations	Comparisons such as *greater than (>)*, *less than (<)*, or *equal to (=)* that help computers make decisions.
User	The person who interacts with a computer by giving instructions and receiving results.
Decision circuits	Electronic parts of a computer that compare numbers or perform logical tests to make decisions.

Unit 3. Typical PC
Conditional Sentences

Questions for discussion:

1. What parts of a computer can you name?
2. Which part of a computer do you think is the most important? Why?
3. What is the difference between *hardware* and *software*?
4. What input and output devices do you use every day?
5. How much memory do you think a modern computer needs?

Task 1. Scan Qr-code and practise new words and phrases in https://quizlet.com.

VOCABULARY

Electronic machine	електронна машина
to accept, process, store and output information	приймати, обробляти, зберігати та виводити інформацію
hardware	апаратне забезпечення, обладнання
software	програмне забезпечення
CPU (Central Processing Unit)	центральний процесор (ЦП)
microprocessor chip	мікропроцесорна мікросхема
to process data	обробляти дані
main memory	основна пам’ять
RAM (Random Access Memory)	оперативна пам’ять (RAM)
ROM (Read Only Memory)	постійна пам’ять (ROM)
peripherals	периферійні пристрої
input devices	пристрої введення
output devices	пристрої виведення
monitor	монітор
printer	принтер
storage devices	пристрої зберігання
hard disk	жорсткий диск
DVD-RW drive	DVD-RW накопичувач
disk drive	дисковод
to read and write data	зчитувати та записувати дані
port	порт (роз’єм)
external devices	зовнішні пристрої
to plug in	підключати

Task 2. Read and translate the text.

Parts of a computer

A computer is an electronic machine that accepts, processes, stores and outputs information. A typical computer consists of two parts: **hardware** and **software**.

Hardware is any electronic or mechanical part of, the computer system that you can see or touch.

Software is a set of instructions, called a program, which tells a computer what to do. There are three basic hardware sections.

1. **The CPU** is the heart of the computer, a microprocessor chip which processes data and coordinates the activities of all the other units.
2. **The main memory** holds the instructions and data which are being processed by the CPU. It has two main sections: RAM (random access memory) and ROM (read only memory).
3. **Peripherals** are the physical units attached to the computer. They include:

Input devices, which let us enter data and commands e.g. the keyboard and the mouse.
Output devices, which let us extract the results (e.g. the monitor and the printer).
Storage devices, which are used to store information permanently (e.g. hard disks and DVD-RW drives).
Disk drives are used to read and write data on disks.
At the back of a computer there are ports into which we can plug external devices (e.g. a scanner, a modem, etc.). They allow communication between the computer and the devices.

USB connector USB ports

Task 3. Look at the computer essentials. Read these quotations and say which computer Task 3. Look at the computer essentials. Read the quotations and say which computer essential they refer to.

1. Accelerate your digital lifestyle by choosing a Pentium at 4.3 GHz.
2. Right-click to display a context-sensitive menu.
3. You will see vivid, detailed images on a 17" display.
4. This will produce high-quality output, with sharp text and impressive graphics.
5. Use it when you want to let the grandparents watch the new baby sleeping."
6. Press any key to continue.

1.	2.	3.	4.	5.	6.

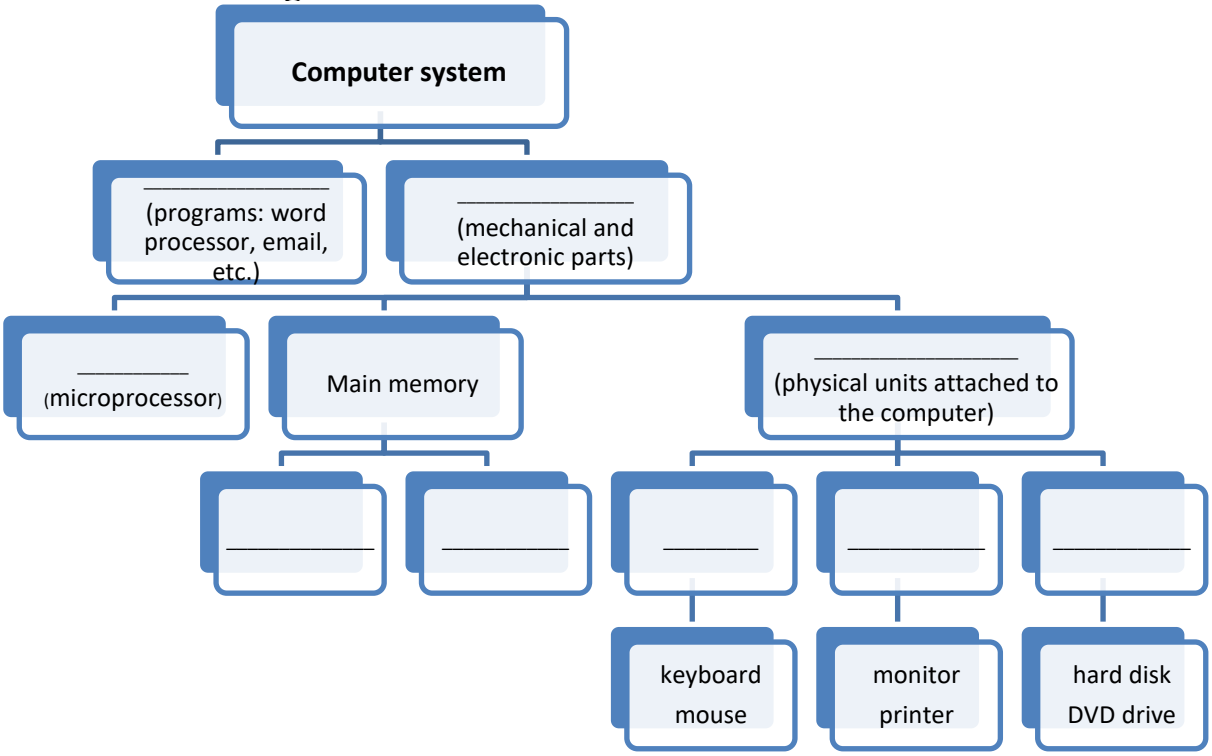
Task 4. Match the terms with their definitions.

1. CD/DVD drive a. any socket into which a peripheral device may be connected
2. speaker b. device used to produce voice output and play back music

3. modem — c. mechanism that reads and/or writes to optical discs
4. port — d. device that converts data so that it can travel over the Internet

1	2	3	4

Task 5. Label the diagram with the correct terms.



Task 6. Complete the diagram and sentences below.

Function of a computer

1. Computer _____ is visible or audible result of data processing – information that can be read, printed or heard by the user.
2. The CPU will process data as instructed by the programs you're running. _____ includes functions like calculating, sorting, editing, drawing and searching.
3. DVDs are expected to replace CDs as _____devices.

4. As a scanner, the Sigma-100 can be used to _____ photographs as well as documents into the computer.

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Task 7. Scan Qr-code. Listen to the instructions. Number the pictures (A-H) and write the instructions down.

First of all, _____

_____

Secondly, _____

_____

Thirdly, _____

Then, _____

_____

_____

Next, _____

After that, _____

_____

_____

Finally, _____

_____

Phrasal verbs consist of a VERB and a PARTICLE (up, on, in, off).
Some phrasal verbs are **transitive**. They take a direct object, e.g.:

subject verb direct object

put on: Alexander puts on his jacket.

Some phrasal verbs are **intransitive**. They don't take a direct object, e.g.:

get up: I got up at six o`clock.

Task 8. Check the meaning of all the phrasal verbs.

Transitive:

back up (your work) _____
Plug in (a printer) _____
Scan in (a document) _____
Shut down (a computer) _____
Turn down (the radio) _____
Turn off (the light) _____
Turn on (the TV) _____
Turn up (the volume) _____
Type in (your username) _____

Intransitive: break down log off log on

Task 9. Match 8 phrases from Task 8 with the pictures.

A _____
B _____
C _____
D _____
E _____
F _____
G _____
H _____

Task 10. Complete the sentenses with the phrasal verbs below. Use the correct tense and form.

back up	**log on**	**plug in**	**shut down**
turn down	**turn on**	**type in**	

1. The music was very loud, so I _____ the volume.
2. I couldn't _____ because I forgot my username and password.
3. Sally _____her username and password, then pressed enter.
4. Yesterday evening, I _____ all my important documents to a hard disk drive so that I didn't lose them.
5. Dan closed all the applications and then _____ his computer.
6. I couldn't print the photo because I forgot to _____ the printer and _____ it _____!

Task 11. Complete the phrasal verbs about computers with the words below.

down (x3)	in (x3)	on (x2)	off (x2)	up (x2)

1. Back _____
2. Break _____
3. Log_____
4. Log_____
5. Plug_____
6. Scan _____
7. Shut _____
8. Turn _____
9. Turn _____
10. Turn _____
11. Turn _____
12. Type _____

Task 12. Use the transitive phrasal verbs from Task 11 to complete the table.

1. Plug in	a printer, a computer, a TV …
2.	the TV, the light, the radio, the printer…
3.	the TV, the light, the radio, the printer…
4.	a document, a photo, a drawing…
5.	your work
6.	the volume, the radio, the TV…
7.	the volume, the radio, the TV…
8.	your username, your password..
9.	a computer

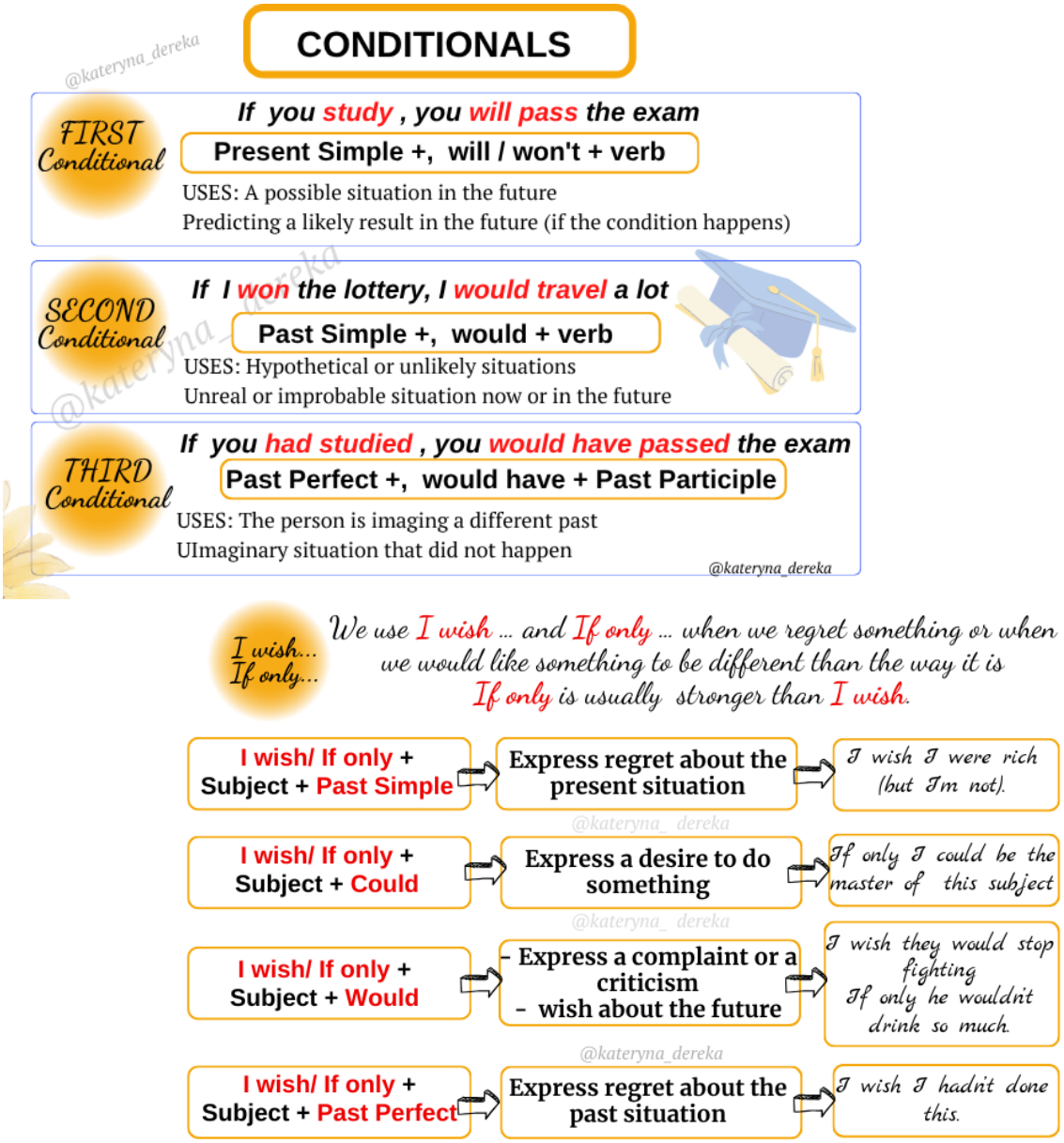
Third Conditional (Третій тип)

Використовується для нереальних ситуацій у минулому, коли умова не здійснилася.

- If the team **had tested** the program properly, it **would have worked** correctly.
- If we **had backed up** the data, we **wouldn't have lost** it.
- If the engineer **had updated** the driver, the system **would have loaded** faster.

Use: для аналізу помилок або ситуацій, яких можна було уникнути.

Task 13. Scan Qr-code and watch the video about Third Conditional.



Task 14. Complete the sentences using "I wish" or "If only" + the correct verb form.

(Use the correct tense – Past Simple, Past Perfect, or could/would.)

1. I wish I _____ (know) how to fix this code error.
2. If only my computer _____ (not / crash) during the presentation yesterday.
3. I wish our team _____ (have) more time to test the software before release.
4. If only the new program _____ (run) faster on older systems.
5. I wish my colleague _____ (explain) the algorithm more clearly.
6. If only I _____ (can) install the latest version of this development tool.
7. I wish our teacher _____ (give) us one more example of pseudocode last lesson.
8. If only the company _____ (not / decide) to change the programming language — we wouldn't have to rewrite everything!

9. I wish I _____ (be) better at debugging complex code.
10. If only the client _____ (understand) how long software testing really takes.

Task 15. Choose the correct option.

1. *I wish / If only* I had saved my project before the power went off.
2. *I wish / If only* I could understand this complicated algorithm.
3. *I wish / If only* my laptop worked faster.
4. *I wish / If only* I hadn't deleted that file by mistake.
5. *I wish / If only* my friend would help me with this programming task.

Task 16. Complete the sentences. Use the correct form of the verbs in brackets. Use contractions where possible.

1. I wish we _____ (not have) a test today.
2. I wish these exercises _____ (not be) so difficult.
3. I wish we _____ (live) near the beach.
4. Do you ever wish you _____ (can travel) more?
5. I wish I _____ (be) better at maths.
6. I wish we _____ (not have to) wear a school uniform.
7. Sometimes I wish I _____ (can fly).
8. I wish we _____ (can go) to Disney World

Task 17. Complete the sentences logically (Type 1 or Type 2)
(Add your own ideas — answers may vary.)

1. If our university installs a new computer lab, _____.
2. If I had a powerful laptop, _____.
3. If the software company hires more testers, _____.
4. If students practiced coding every day, _____.
5. If the Wi-Fi connection fails during the exam, _____.
6. If I were a system administrator, _____.
7. If the team meets the deadline, _____.
8. If my PC didn't overheat so often, _____.

Task 18. Complete the sentences with the correct form of the verbs in brackets.
(Use Conditional Types 0–3 depending on the meaning.)

1. If a program _____ (contain) syntax errors, the compiler _____ (not run) it.
2. If you _____ (install) the latest version of the operating system, your laptop _____ (work) faster.
3. If the network server _____ (crash) last night, we _____ (lose) all the stored data.
4. If I _____ (know) Python better, I _____ (create) a more efficient algorithm.

5. If the voltage _____ (exceed) the limit, the circuit automatically _____ (shut down).
6. If users _____ (not update) their passwords regularly, hackers _____ (access) their accounts easily.
7. If the software engineer _____ (test) the module carefully, it _____ (not cause) system errors.
8. If we _____ (have) more time, we _____ (develop) a mobile version of the application.
9. If the client _____ (report) the issue earlier, we _____ (fix) it before the release.
10. If you _____ (click) this icon, the application _____ (open) the settings panel.

Task 19. Scan QR-code and do the Task.

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GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
Computer	An electronic machine that accepts, processes, stores, and outputs information according to a set of instructions.
Hardware	The physical parts of a computer system — components you can see and touch (e.g. CPU, monitor, keyboard).
Software	A set of programs or instructions that tell a computer what to do. It controls the hardware.
CPU (Central Processing Unit)	The main part of a computer that performs calculations, processes data, and coordinates other components. Often called the "brain" or "heart" of the computer.
Microprocessor	A small electronic chip that functions as the CPU of a computer.
Main memory	The computer's primary storage, which temporarily holds data and instructions for processing.
RAM (Random Access Memory)	Temporary memory that stores data while a program is running; it is erased when the computer is turned off.
ROM (Read Only Memory)	Permanent memory that stores essential instructions the computer needs to start and operate.
Peripherals	External or additional devices connected to the main computer unit, such as keyboard, mouse, printer, or scanner.

Term / Expression	Definition / Explanation
Input devices	Devices used to enter data or commands into the computer (e.g. keyboard, mouse).
Output devices	Devices that show or produce results from the computer (e.g. monitor, printer).
Storage devices	Hardware components used for saving information permanently (e.g. hard disk, SSD, DVD drive).
Disk drive	A device that reads and writes data on disks (e.g. CD, DVD, or hard drive).
Port	A socket at the back or side of the computer used to connect external devices (e.g. USB port, HDMI port).
External device	A piece of hardware connected to the computer from outside, such as a modem, scanner, or flash drive.
Data processing	The act of converting raw data into useful information using the CPU and memory

Unit 4 Functional Organization of the Computer. Conditional Sentences

Questions for discussion:

1. What happens inside a computer when you press a key or click the mouse?
2. How does your computer “know” what to do with your commands?
3. What parts of a computer are responsible for:
   a) remembering information?
   b) calculating numbers?
   c) showing the results?

Quick quiz (guessing game).
Read the clues and guess which computer part is being described:

1. I think and make decisions. What am I?
2. I remember everything, but only when the power is on.
3. I let information in.
4. I send information out to you.
5. I tell everyone else what to do.

VOCABULARY

Operation	операція, дія
to relate	мати відношення, стосуватися, пов’язувати
a broad view	широкий погляд, загальне уявлення
unit	блок, пристрій, одиниця
input (n)	вхідні дані, введення
input (v)	вводити (дані)
to insert	вставляти
storage	зберігання, накопичувач
memory	пам’ять
available	доступний, наявний
at the appropriate time	у відповідний час
arithmetic-logical unit	арифметико-логічний пристрій (АЛП)
output (n)	вихідні дані, результат
output (v)	виводити (дані)
to remove	видаляти, прибирати
control unit	блок керування
cause (v)	спричиняти
cause (n)	причина
to feed (fed, fed)	подавати, вводити (дані)
to interpret	тлумачити, інтерпретувати
to issue commands	віддавати команди, подавати накази
pulse — no-pulse	імпульс — відсутність імпульсу

Scan Qr-code and learn new words and phrases.

Task 1. Read the text and speak about the main functional units of digital computers and say what they are used for.

FUNCTIONAL UNITS OF DIGITAL COMPUTERS

As we know, all computer operations can be grouped into **five functional categories**. The method in which these five functional categories are related to one another represents the functional organization of a digital computer.

The **five major functional units** of a digital computer are:

1) **Input**— to insert outside information into the machine;
2) **Storage** or **memory** — to store information and make it available at the appropriate time;
3) **Arithmetic-logical unit** — to perform the calculations;

4) **Output** — to remove data from the machine to the outside world;
5) **Control unit** — to cause all parts of a computer to act as a team.

Figure 1 shows how the **five functional units** of the computer act together. A complete set of instructions and data are usually fed through the input equipment to the memory where they are stored. Each instruction is then fed to the control unit. The control unit interprets the instructions and issues commands to the other functional units to cause operations to be performed on the data. Arithmetic operations are performed in the arithmetic-logical unit, and the results are then fed back to the memory. Information may be fed from either the arithmetic unit or the memory through the output equipment to the outside world.

The five units of the computer must communicate with each other. They can do this by means of a machine language which uses a **code** composed of combinations of electric pulses. These pulse combinations are usually represented by ***zeros*** and ***ones***, where the *one* may be a pulse and the *zero* — a no-pulse. Numbers are communicated between one unit and another by means of these **one-zero** or **pulse—no-pulse combinations**. The input has the additional job of converting the information fed in by the operator into machine language. In other words, it translates from our language into the pulse—no-pulse combinations understandable to the computer. The output's additional job is converting the pulse—no-pulse combinations into a form understandable to us, such as a printed report.

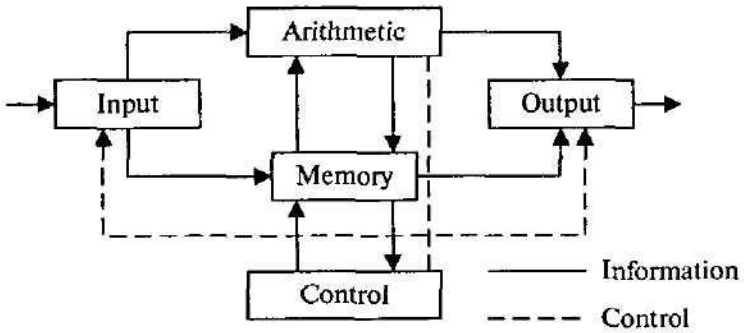

Fig.1

VOCABULARY EXERCISES

Task 2. Give the English equivalents for the following:

Функціональна організація _____
дії комп'ютера _____
зв'язувати один з одним _____
вводити інформацію ззовні _____
робити інформацію доступною _____
виконувати обчислення _____
виводити інформацію _____
блок управління _____
видавати команди _____

примушувати виконувати команди	
вихідний пристрій	
зовнішній світ	
зв'язуватися один з одним	
комбінація електричних імпульсів	
«холостий» імпульс	
імпульси, розпізнавані комп'ютером	

Task 3. Divide all the words given below into the three groups according to their suffixes (a noun, an adjective and an adverb) and translate them.

Organization, functional, available, equipment, processor, completely, architectural, converter, convertible, controller, removable, logical, addition, additional, usually, accomplishment, operator, operation, mainly, communication, insertion, electronic, digital, instruction, generally, arithmetic, daily, development, central, lately, visible, substitution, understandable.

Task 4. Fill in the blanks with the words from the box.

include, pulses, coordinating, transfer, language, machine, unit, fall into, removal, formats, instructions, control, ones, inserting, calculations, memory (2), interaction, computer, combinations, functional

All computer operations _____(1) five functional categories, representing the _____(2) organization of a digital computer. These categories _____(3) Input for _____(4) outside information, Storage for _____(5), Arithmetic-logical unit for _____(6), Output for data _____(7), and Control unit for _____(8) computer parts. These units work together, with _____(9) and data fed through input to _____(10), interpreted by the _____(11) unit, operations performed in the arithmetic _____(12), and results sent back to memory.

The five computer units communicate through _____(13) language using combinations of electric _____(14), typically represented as zeros and _____(15). These combinations _____(16) numbers between units, with input converting operator-fed information into machine _____(17) and output converting pulse _____(18) into human-readable _____(19) like printed reports. This process ensures seamless _____(20) among the functional units of a _____(21) for efficient operation.

Task 5. Translate the word-combinations with the given words.

Computer: analog computer; digital computer; hybrid computer; all-purpose computer; general-purpose computer; fifth-generation computer; game computer; notebook computer; pocket computer; portable computer.

Unit:	*Function*:

Task 6. Give the comparative and the superlative degrees of the following adjectives.

A. Small; fast; new; long; late; wide; young; easy; great; dull; rich; bulky; large; vast; early; old; broad.

B. Frequent; reliable; approximate; significant; intricate; possible; basic; remarkable; common; modern; dependent; general; necessary; successful; scientific; universal.

C. Good; bad; little; many.

Task 7. Look through the text again and answer the questions using the text.

1. What represents the functional organization of a computer?
2. What can we get by studying the functional organization?
3. What is the function of the input device?
4. What does memory serve for?
5. What is the task of the arithmetic-logical unit?

CONVERSATIONAL EXERCISE

❖ Speak about the main functional units of digital computers and say what they are used for.

Task 8. Match the two sentence halves and write a–g next to the numbers 1–7.

1…….. I wouldn't have overslept	a. if you'd asked.
2…….. If she had gone to bed earlier,	b. you wouldn't have been so stressed at the last minute.
3…….. I could have lent you the money	c. she wouldn't have been so tired.
4…….. They wouldn't have found out	d. if you had studied medicine.
5…….. You could have been a doctor	e. if my alarm clock had gone off.
6…….. If you'd been more organised,	f. they wouldn't have had so many problems.
7…….. If they'd taken my advice,	g. if you hadn't told them

Task 9. Put the verbs in brackets in the right form.

1. If you _____(to understand) the rule, you would have written the test paper successfully.
2. If you had written the test paper successfully, you _____(not to get) a «two».
3. Your mother _____(not to scold) you if you had not got a "two".
4. If she_____ (to ask) me yesterday, I should certainly have told her all about it.
5. If he is not very busy, he_____ (to agree) to go to the museum with us.
6. If I_____ (not to be) present at the lesson, I should not have understood this difficult rule.

Task 10. Match the halves to make logical conditional sentences.

A

1. If we didn't have cloud storage,
2. If developers had optimized the code,
3. If you don't save the document,
4. If artificial intelligence keeps evolving,
5. If we used open-source tools,
6. If the battery overheats,
7. If the operating system fails,
8. If I were a software architect,

B

a) the device automatically shuts down.
b) I would design a more secure framework.
c) it will improve decision-making in most IT fields.
d) the computer will restart unexpectedly.
e) we would lose all unsaved changes.
f) our company wouldn't need to pay for licenses.
g) we wouldn't be able to store such big data.
h) the application would run much faster.

Task 11. Choose the correct option (A, B, or C).

1. If I _____ more experience in programming, I would apply for a senior developer position.
   A) have B) had C) will have
2. If the power _____ off during installation, the system will crash.
   A) goes B) went C) gone
3. If we _____ the update yesterday, the problem would be fixed now.
   A) install B) installed C) had installed
4. If the internet connection is lost, the video conference _____ automatically.
   A) ends B) would end C) ended
5. If they _____ more memory, their app would process images faster.
   A) have B) had C) will have

Task 12. Scan Qr-code and do the task.

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GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
Functional units	The main parts of a computer that perform specific functions such as input, processing, storage, output, and control.
Functional organization	The way in which the five major units of a computer are related and interact with each other.
Input unit	The part of the computer that allows information from the outside world to be entered into the system.
Storage / Memory unit	The component used to store data and instructions for future use and make them available when needed.
Arithmetic-logical unit (ALU)	The unit that performs arithmetic operations (addition, subtraction, etc.) and logical operations (comparison, decision making).
Output unit	The component that transfers processed data and information from the computer to the outside world.
Control unit	The unit that directs and coordinates the operations of all parts of the computer.
Instruction	A command that tells the computer what operation to perform.
Machine language	The basic language of computers consisting of binary codes (0s and 1s) that represent electric pulses.

Term / Expression	Definition / Explanation
Pulse–no-pulse combination	The binary code form where “1” represents a pulse and “0” represents no pulse, used to transmit data between units.
To interpret	To translate or understand the meaning of instructions.
To issue commands	To send control signals or instructions to other units.
To feed (data)	To supply or input data into a system.
To convert	To change data from one form into another (e.g., from human language into machine code).

Unit 5. Functional Organisation of the Computer. Digital Computer. Conditional Sentences

Have you ever wondered how your computer *“thinks”*? When you press a key, run a program, or calculate something — thousands of **logic gates** (tiny decision-makers) inside your device instantly decide what to do next.

Let’s take a peek inside the brain of a digital computer!

Questions for discussion:

1. What happens inside a computer when it performs a calculation?
2. Why do you think computers need *logic* to function?
3. Can a computer really «think» or «decide»? Why or why not?
4. Which part of a computer stores information, and which part «understands» commands?
5. Why can computers calculate much faster than humans?

Revising information from the previous Unit

Task 1.Choose the correct answer.

1. **Which of the following is NOT one of the five major functional units of a digital computer?**
   A. Input
   B. Display unit
   C. Output
   D. Control unit

2. **In the context of computer operations, what does 'input' refer to?**
    A. The output of processed information
    B. The conversion of machine language to human language
    C. The process of storing data
    D. The insertion of outside information into the machine
3. **What is the primary role of the control unit in a computer?**
    A. To interpret instructions and issue commands
    B. To store data
    C. To perform arithmetic operations
    D. To convert data into machine language
4. **Which functional unit is responsible for performing arithmetic operations?**
    A. Storage unit
    B. Input unit
    C. Arithmetic-logical unit
    D. Control unit
5. **What happens to the results of arithmetic operations in a computer?**
    A. They are displayed immediately
    B. They are fed back to memory
    C. They are printed out
    D. They are sent to the control unit
6. **Which of the following statements accurately describes the relationship between the functional units of a computer?**
    A. They operate independently without any communication
    B. They only interact during the boot process
    C. They require human intervention to function together
    D. They communicate using a common machine language
7. **How do the five functional units of a computer communicate with each other?**
    A. Via graphical user interfaces
    B. By using machine language
    C. Through human language
    D. Through verbal commands
8. **What does machine language primarily consist of?**
    A. Visual representations of data
    B. Combinations of electric pulses represented by zeros and ones
    C. Text-based commands
    D. High-level programming syntax
9. **How does the input unit contribute to the operation of a computer?**
    A. By storing data
    B. By displaying output to the user
    C. By converting information into machine language
    D. By performing calculations

10. **What is the function of the output unit in a computer?**
    A. To convert pulse-no-pulse combinations into a human-understandable form
    B. To store data for future use
    C. To perform calculations
    D. To interpret user commands

Task 2. Complete the following sentences with the most appropriate word from the list provided.

Input, Output, Storage, Control Unit, Arithmetic-logical Unit (ALU), Machine Language, Electric Pulses

1. The computer processes information using a series of _____.
2. The _____ is responsible for retrieving instructions from the memory.
3. The _____ allows the computer to communicate with the outside world.
4. The _____ is the brain of the computer, controlling all other components.
5. The _____ is responsible for performing calculations such as addition, subtraction, and multiplication.
6. The computer's _____ is a set of instructions that it can directly understand.
7. The _____ unit is responsible for temporarily holding data and programs.

VOCABULARY

Digital computer	цифровий комп’ютер
data-processing system	система обробки даних
control system	система керування
digital communication system	система цифрового зв’язку
logic gate / circuit	логічний елемент / схема
OR gate	логічний елемент АБО
AND gate	логічний елемент І
NOT gate	логічний елемент НЕ
FLIP-FLOP	тригер (двостійкий логічний елемент)
numerical computation	числове обчислення
feasible	можливий, здійсненний

memory	пам’ять
control unit	керуючий пристрій
arithmetic device / unit	арифметичний пристрій
central processor / CPU	центральний процесор
input-output devices	пристрої введення-виведення
operand	операнд (вхідне значення для обчислення)
command / instruction	команда / інструкція
to interpret orders	інтерпретувати команди
partial result	проміжний результат

Scan Qr-code and learn new phrases.

Task 3. Read the text and say what additional information about the main devices of a digital computer you found.

SOME FEATURES OF A DIGITAL COMPUTER

It should be noticed that even in a **large-scale digital system**, such as in a computer, or in a **data-processing**, control or digital-communication system, there are only a **few basic operations** which must be performed. These operations may be operated many times. The four circuits most commonly employed in such systems are known as the *OR, AND, NOT and FLIP-FLOP***.** They are called **logic gates** or **circuits**.

An **electronic digital computer** is a system which processes and stores very large amount of data and which solves scientific problems of numerical computations of such complexity and with such speed that solution by human calculation is not feasible. So the computer as a system can perform **numerical computations** and follow instructions with extreme speed but it cannot program itself.

We know that the numbers and the instructions which form the program, the computer is to follow, are stored in an essential part of the computer called the **memory**. The second important unit of the computer is the control whose function is to interpret orders. The **control** must convert the command into an appropriate set of voltages to operate switches and carry out the instructions conveyed by the order. The third basic element of a computer is the **arithmetic device**, which contains the circuits performing the arithmetic computations: addition, subtraction, etc. The control and arithmetic components are called the **central processor**. Finally a computer requires appropriate **input-output** devices for inserting numbers and orders into the memory and for reading the final result.

Suppose a command to perform an addition or division has been transmitted to the central processor. In response to this order the control must select the correct operands from the memory, transmit them to the arithmetic unit and return to the memory the result of the computation. The memory serves for storing not only the original input data, but also the partial results which will have to be used again as the computation proceeds.

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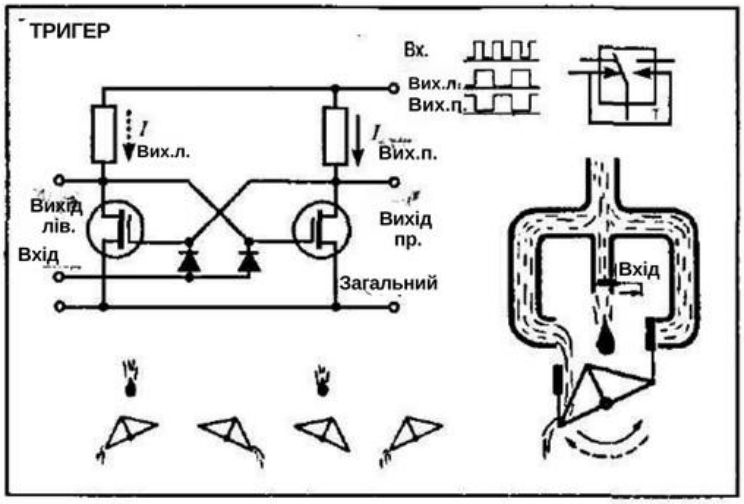

Fig.2. Flip-flop

Task 4. Choose the correct answer.

1. **What is the primary function of logic gates or circuits in digital systems?**
   A. To perform numerical computations
   B. To interpret orders and convert them into voltages
   C. To perform basic logical operations
   D. To store data and instructions
2. **What is the purpose of the control unit in a computer?**
   A. To perform arithmetic computations
   B. To interpret orders and control the flow of operations
   C. To store the original input data
   D. To read the final result
3. **How do computers solve scientific problems that are too complex for human calculation?**
   A. By using extreme speed to process and store data
   B. By following instructions with extreme speed
   C. By programming themselves to perform the necessary computations
   D. All of the above
4. **What is the role of the arithmetic unit in a computer?**
   A. To interpret orders and convert them into voltages

B. To perform basic logical operations

C. To perform arithmetic computations like addition and subtraction

D. To store the partial results of computations

5. **What happens when a computation command is sent to the central processor?**

A. The control unit selects the correct operands from memory

B. The control unit transmits the operands to the arithmetic unit

C. The control unit returns the result to the memory

D. All of the above

6. **What is the primary purpose of the memory in a computer?**

A. To store the original input data

B. To store the partial results of computations

C. To store the final results of computations

D. All of the above

7. **Which of the following is not one of the four basic circuits commonly used in digital systems?**

A. OR gate

B. AND gate

C. NOT gate

D. NOR gate

8. **Which of the following is NOT one of the basic logic gates used in digital systems?**

A. AND

B. OR

C. XOR

D. FLIP-FLOP

9. **In the process of executing a command for an arithmetic operation, what is the sequence of actions performed by the control unit?**

A. Select operands, perform computation, and transmit results to input-output devices

B. Perform computation, store results in memory, and interpret orders

C. Select operands from memory, transmit them to arithmetic unit, and return results to memory

D. Store data in memory, interpret orders, and manage input-output devices

Task 5. Give the English equivalents for the following:

Великомасштабна цифрова система _____

система обробки даних_____

система цифрового зв'язку _____

найбільш широко поширені схеми _____

логічні схеми _____

вирішувати наукові проблеми _____

виконувати числові обчислення _____

інтерпретувати команди _____

приводити в дію перемикачі _____

виконувати команди _____

потребувати (вимагати) необхідного облаштування введення-виведення_____

введення чисел і команд _____

прочитування кінцевих результатів _____

передавати команду в центральний процесор _____

у відповідь на _____

зберігання часткових результатів _____

Task 6. Arrange the following words in pairs according to the similar meanings (synonyms).

Verbs: relate, employ, perform, remove, operate, show, interpret, select, issue, use, receive, cause, print, make, compute, execute, take away, require, act, convert, carry out, demand, permit, demonstrate, choose, transmit, type, store, get, calculate, proceed, continue, keep, allow.

Nouns: response, unit, component, computation, storage, amount, digit, element, memory, instruction, device, equipment, connection, circuit, order, command, information, quantity, answer, calculation, number, data.

Adjectives: broad, complete, each, appropriate, every, essential, digital, original, full, wide, initial, major, large, numerical, common, necessary, usual, important, general, great.

Task 7. Match the terms with the definitions.

1. Functional organization of a computer	a) processes and stores large amount of data and solves problems of numerical computations;
2. Input	b) circuits used in large-scale digital systems;
3. Memory	c) method of interrelation of the main units of a computer;
4. Control unit	d) removing data from the device to the outside world;
5. Output	e) inserting information into the computer;
6. Arithmetic unit	f) a code of combinations of electric pulses;
7. Machine language	g) performs addition, subtraction, multiplication, etc;
8. Logic gates	h) stores original data as well as partial results;

9. Digital computer i) causes all parts of the computer to act as a team.

1	2	3	4	5	6	7	8	9

Task 8. Look through the text again and answer the questions using the text.

1. What are the most commonly used circuits in any computer?
2. How are they called?
3. What kind of a system is a digital computer?
4. Is there anything that a computer cannot do itself? What is it?
5. Where are the instructions and digits stored?

CONVERSATIONAL EXERCISES

❖ **Speak about the computer system organization using the diagram (Fig. 3).**

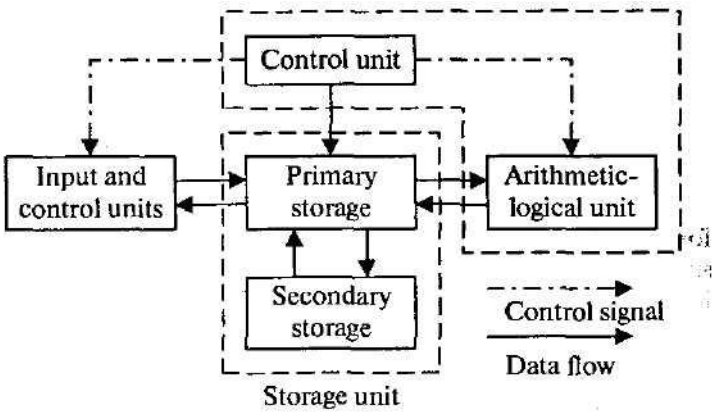

Fig.3. Computer system organisation

Task 9. Scan Qr-code and do the tasks to the topic «Digital Computer».

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Term	Definition / Explanation
Digital computer	A machine that processes data in binary form (0s and 1s) and performs calculations and logical operations at high speed.
Logic gate	A basic electronic circuit that performs a logical operation such as AND, OR, or NOT. These are the building blocks of all digital systems.

Term	Definition / Explanation
OR gate	A circuit that gives a “true” output if *any* of its inputs are true.
AND gate	A circuit that gives a “true” output only if *all* inputs are true.
NOT gate	A circuit that inverts the input signal (true becomes false and vice versa).
FLIP-FLOP	A circuit that stores one bit of data and changes state when triggered — used for memory storage.
Memory	A unit that stores data and instructions so the computer can access and process them.
Control unit	The part of the CPU that interprets instructions and directs the computer’s operations.
Arithmetic unit	The part of the CPU that performs mathematical calculations such as addition and subtraction.
Central processor (CPU)	The “brain” of the computer that contains both the control and arithmetic units.
Operand	A number or data item that an operation (like addition or division) acts upon.
Input-output devices	Tools that allow data to enter (keyboard, mouse) and results to leave (monitor, printer) the computer.
Partial result	An intermediate outcome of a calculation that will be used again later in the process.
Command / instruction	A coded order given to the computer to perform a specific operation

Unit 6 Data Transmission
Conditionals

LEAD_IN

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Questions for discussion:

1. How often do you use the Internet during the day?
2. What do you usually use it for? (communication, studying, entertainment, shopping, etc.)
3. Can you imagine your life without the Internet? Why or why not?
4. What devices do you use to connect to the Internet?

Task 1. Read and translate the text. Think about its title.

Communications in a Connected World

The internet has become such a part of everyday life that we almo st take it for granted.

Normally, when people use the term internet, they are not referring to the physical connections in the real world. Rather, they tend to think of it as a formless collection of connections. It is the "place" people go to find or share information.

Local Networks

1. Small home networks connect a few computers to each other and to the internet.
2. The SOHO network allows computers in a home office or a remote office to connect to a corporate network, or access centralized, shared resources.

3. Medium to large networks, such as those used by corporations and schools, can have many locations with hundreds or thousands of interconnected hosts.
4. The internet is a network of networks that connects hundreds of millions of computers world-wide.

VOCABULARY Practise the following words and word combinations.

Network connections

– **bandwidth**	Пропускна здатність (каналу зв'язку)
– **baud**	Бод (одиниця швидкості передачі сигналів)
– **bits per second (bps)**	Біти за секунду (одиниця швидкості передачі даних)
– **optical fibre**	Оптоволоконний кабель

– **packet receive**	Отримання пакету (даних у мережі)
– **signal**	Сигнал
– **transmit**	Передавати (дані, сигнал)
– **transmission speed**	Швидкість передачі даних
– **twisted pair**	Вита пара (тип мережевого кабелю)

Network operation

– **configure**	Налаштовувати (систему, пристрій, мережу)
– **download**	Завантажувати (дані з Інтернету на комп'ютер)
– **hack**	Зламувати (систему, комп'ютерну мережу)
– **hub**	Концентратор, мережевий вузол
– **install**	Встановлювати (програму, обладнання)
– **internet service provider (ISP)**	Постачальник інтернет-послуг (інтернет-провайдер)
– **local area network (LAN)**	Локальна мережа (LAN)
– **switch**	Комутатор (мережевий пристрій)
– **transmit**	Передавати
– **upload**	Завантажувати (дані з комп'ютера в Інтернет)
– **web page**	Вебсторінка
– **website**	Вебсайт
– **wide area network (WAN)**	Глобальна мережа (WAN)
– **wireless**	Бездротовий

A prefix comes at the beginning of a word and usually has a specific meaning, for example inter = between.

☝ **Look at the following prefixes and their use in the above IT words/phrases:**

Prefix	**meaning of prefix**	**example of use**
inter-	between	internet, interconnect, interactive, international
intra-	within	intranet, e.g. company intranet
trans-	across	transmit, transfer, transaction
co-/com-/con-	with	combine, compatible, connect, configure
up-	up (to internet)	upload
down-	down (from internet)	download, downtime, i.e. when the network is down (not working)

Task 2. Choose the correct word in each of the following.

1. The speed with which a modem can process data is measured in _____
   a) bandwidth b) bits per second (bps) c) signal
2. Cables consisting of several copper wires each with a shield are known as _____ cables.
   a) twistedpair b) optical fibre c) power cables
3. Computers that are connected together within one building form a_____.
   a) WAN b) ISP c) LAN
4. If you transfer a file from a remote computer to your computer, you_____.
   a) download b) upload c) run
5. To send out information is to_____.
   a) signal b) packet c) transmit
6. A document containing information and graphics that can be accessed on the internet is _____.
   a) a website b) a web page c) the World Wide Web

Task 3. Complete the words in the following sentences by adding the prefix *inter-, intra-, trans-, com-con-, up- or down-.*

1. Last month computer _____time cost the company over €10,000 in lost production.
2. The computers in the production department have now been successfully_____ connected with those in the planning department.
3. Once you have completed payment details the data wall be _____mitted via a secure link.
4. We cannot network these computers because the systems are not *com*patible.
5. Many companies distribute internal documents on their own _____net.
6. Once the home page has been completed, we'll be ready to _____load the site.
7. Cables are being laid throughout the building as the network requires physical_____nections.
8. Using the network he was able to _____bine the data from different reports.

Task 4. Here is a list of instructions for someone wanting to set up a small network. Put the instructions in the correct order.

a. Make wiring and layout plans for your network.
b. Hook up the network cables by connecting everything to the hub.
c. Check that each computer has an IP address and give it a name.
d. If you're installing a small network, twisted pair will be adequate. However, in order to span greater distances and to minimize magnetic and electrical interference use fibre optic cable.
e. Decide on the type of network you want to install. To enable you to transfer large amounts of data, choose Fast Ethernet (100BaseT),

f. Install network adapters in the computers.
g. Add an internet gateway to your network to set up a shared internet connection.
h. Install driver software for the adapter driver and install client software to share printers and files.
i. Check which protocols are installed and add any other protocols you require.
j. Get the hardware you need: an Ethernet adapter card for each computer that doesn't have an Ethernet port, a hub if you've got more than two computers, cables and wall jacks.

Task 5. Scan Qr-code and do the Quiz in https://quizizz.com/ program.

@kateryna_dereka

ICT systems: components and functions

ICT systems arc much more than computers. An ICT system involves the use of computers or other types of hardware to meet a specific need. A LAN, local area network, can be an example of an ICT system, but interactive television and the database of a library are types of systems too.

ICT systems have these **components:**

- software, instructions and data;
- hardware, computers and other devices;
- personnel, people who use, design, control or benefit from the system.

The components perform these **basic functions**:

- input, the data is collected and entered;
- processing, data is changed or manipulated;
- output, the results are shown;
- communication and feedback, the results are sent out and new data is collected and entered in the system;
- memory or storage of data.

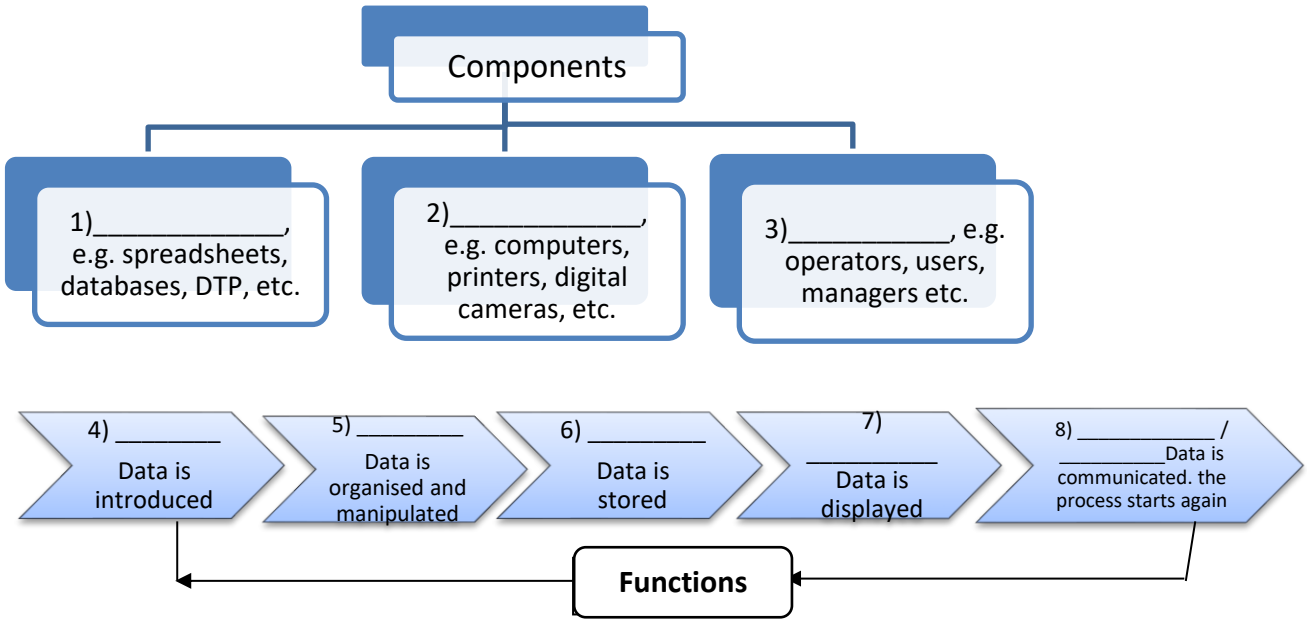
At present most of the devices used in ICT systems are multi-purpose: mobile phones can be used as digital cameras or agendas, printers are also scanners and faxes. Not only is there media integration in the hardware, but also in the services offered by these telecommunication systems.

For example, call centres are one example of computer telephony integration where companies use databases and telephones for telemarketing. The Internet, a

global network of computers, enables users to exchange files, send emails and surf the Web to find information, take part in e-commerce, etc.

Radio has also adopted the digital technology DAB, Digital Audio Broadcasting. Most digital radio stations are broadcast together with television signals.

Task 6. Fill in the diagram of components and functions of ICT systems.



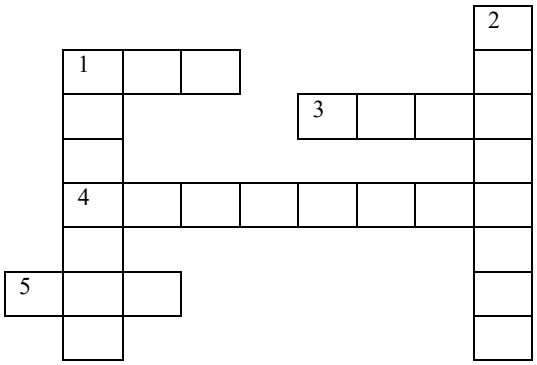
Task 7. Solve the clues and complete the puzzle.

Across

1 A new radio communication system.
3 A system that integrates telephones and computer is a_____centre.
4 A global system of networks of integrated services.
5 A device used to send and receive exact copies of documents.

Down

1. Similar to interactive TV.
2. Written information you get on your TV screen.



Task 8. Choose the correct answer.

1. **What is an example of a multi-purpose device used in ICT systems?**
   A. A traditional landline telephone
   B. A mobile phone with camera functionality
   C. A dedicated scanner
   D. A standalone printer
2. **What is the internet commonly referred to as?**
   A. A physical network
   B. A formless collection of connections
   C. A collection of computers
   D. A closed network
3. **Which function involves collecting and entering data into an ICT system?**
   A. Input
   B. Processing
   C. Output
   D. Communication
4. **Which type of network connects computers in a home office to a corporate network?**
   A. Medium to large network
   B. Small home network
   C. SOHO network
   D. Global network
5. **What is the primary role of call centres in computer telephony integration?**
   A. Technical troubleshooting
   B. Telemarketing
   C. Customer support
   D. Data analysis
6. **Which media has adopted digital technology through Digital Audio Broadcasting?**
   A. Television
   B. Radio
   C. Magazines
   D. Print newspapers
7. **What is the main function of the internet in global communication?**
   A. Printing documents
   B. Broadcasting television signals
   C. Exchanging files and emails
   D. Sending physical mail
8. **What are the components of an ICT system?**
   A. Software, hardware, and personnel
   B. Software, hardware, and data
   C. Hardware, software, and communication
   D. Data, personnel, and processing

9. **Which component of an ICT system involves changing or manipulating data?**
   A. Communication
   B. Output
   C. Input
   D. Processing
10. **What is computer telephony integration commonly used for in businesses?**
   A. Data storage
   B. Telemarketing
   C. Video conferencing
   D. Social media marketing

Task 9. Scan Qr-code and watch presentation to the topic «Conditionals».

Task 10. Scan QR-code and do the Task.

Task 11. Fill in the gaps with the correct form of the verbs in brackets.

ANN: How was your Spanish exam, Claire?
CLAIRE: Fine, I guess. I got a B. I could have got a better mark provided I _____ (work) harder on the verbs. And you?
ANN: I didn't study and I failed, but I _____ (fail) even if I had studied, that's why I decided not to do it.
CLAIRE: That's not true. Nobody fails an exam as long as they _____ (study).
ANN: That's easy for you to say. If you _____ (be) in my shoes, you would think differently. Sometimes people work hard, but they don't get the results they want. It's different for you; for you, it's easy to succeed in whatever you want to succeed in.
CLAIRE: That's unfair. I wouldn't be where I am today if I _____ (not work) very hard all these past years.

Task 12. Complete the sentences.

(Use the correct form of the verbs in brackets).

1. If the Internet connection _____ (be) faster, we _____ (download) the files in a few minutes.
2. You will understand this topic better if you _____ (listen) carefully.

3. If I _____ (know) about the meeting yesterday, I _____ (join) it online.
4. If the company _____ (upgrade) its software, it _____ (work) more efficiently.
5. I would help you with your report if I _____ (have) more time.
6. If you _____ (press) that button, the printer will start.
7. The system wouldn't have crashed if the technician _____ (install) the update.
8. If students used cloud storage, they _____ (not lose) their files so often.
9. You won't be able to log in if you _____ (forget) your password.
10. If we _____ (not have) a backup, we would have lost all our data.

Task 13. Choose the correct option.

1. If I had known / knew / know about the virus, I would have installed antivirus software earlier.
2. If you save your work regularly, you won't lose / wouldn't lose / didn't lose your data.
3. If the Wi-Fi signal was / were / had been stronger, we could have joined the video call.
4. The project will fail if the team don't cooperate / didn't cooperate / hadn't cooperated.
5. If I had more experience / have more experience / had had more experience, I would apply for that IT job.
6. If the server had crashed, users will lose / would lose / would have lost their files.
7. If you update / updated / had updated your system, it would work faster.
8. I will contact you if any problems occur / occurred / have occurred.

Term / Expression	Definition / Explanation
Internet	A global network that connects millions of computers around the world and allows them to communicate and share information.
Network	A group of connected computers or devices that can exchange data.

Term / Expression	Definition / Explanation
Local Network (LAN)	A small network that connects computers within a limited area, such as a home, office, or school.
SOHO Network	"Small Office / Home Office" network that connects remote or small business computers to larger corporate systems.
Host	A computer or other device connected to a network that provides or uses network services.
Corporate Network	A private network used by a company or organization to connect its computers and share data securely.
Shared Resources	Files, devices, or data that can be accessed by multiple users on the same network (e.g. shared printers or folders).
Connection	The link that allows data to be transferred between computers or networks.
Network of Networks	A phrase that describes the Internet as a system made up of many smaller interconnected networks.
Remote Office	A workplace located away from the company's main office but connected via the Internet or private networks.
ICT (Information and Communication Technology)	The use of technology to manage and communicate information through computers, networks, and other devices.
ICT System	A combination of hardware, software, data, and people that work together to collect, process, store, and share information.
Hardware	The physical parts of a computer system (e.g. monitor, keyboard, printer, mobile phone).
Software	The programs and instructions that tell a computer what to do.
Data	Information that is entered, processed, or stored by a computer system.
Personnel	The people who design, operate, or use an ICT system.
Input	The stage where data is collected and entered into the system.

Term / Expression	Definition / Explanation
Processing	The action of changing or manipulating data to produce useful information.
Output	The stage where processed information is displayed or printed.
Storage (Memory)	The saving of data and programs so they can be used later.
Feedback	Information sent back into the system to improve or update data.
LAN (Local Area Network)	A network that connects computers within a small area, such as a school or office.
Integration	The combination of different technologies or services into one system (e.g. printer–scanner–fax).
Database	A structured collection of data that can be easily accessed and managed.
Call Centre	A place where operators use computers and phones to provide customer service or telemarketing.
Telecommunication	The exchange of information over long distances using electronic systems such as phones or the Internet.
DAB (Digital Audio Broadcasting)	A digital radio technology that provides high-quality sound and transmits more channels than traditional radio.
E-commerce	Buying and selling products or services through the Internet.
Interactive Television	A system that allows viewers to interact with TV programs using a remote control or Internet connection.
Computer Telephony Integration (CTI)	Technology that connects computers with telephone systems, often used in customer support centres

Unit 7. Methods of Data Transmission. Conditionals

Questions for discussion:

1. What kind of personal data do you usually share online?
2. Do you think it's safe to share your data on social media? Why or why not?
3. What happens when you send a message or upload a file — how does the data «travel»?
4. What do you know about Internet speed and data transmission? What affects it?
5. Have you ever experienced a slow Internet connection? What do you think caused it?

VOCABULARY **Practise the following words and word combinations.**

Binary digits	двійкові цифри (біти)
letter	літера
number	число
data	дані
volunteered data	надані (добровільно подані) дані
observed data	спостережувані (зафіксовані) дані
inferred data	отримані шляхом аналізу (виведені) дані
to represent	представляти, позначати
value	значення
to interpret	інтерпретувати, тлумачити
to transform	перетворювати
to convert	конвертувати, перетворювати
to transmit	передавати (дані, сигнал)
to consist	складатися (з чогось)
to encounter	зустрічати, стикатися з
transmission	передача (даних, сигналу)
destination	пункт призначення
location	місце розташування
copper wire	мідний дріт
fiber-optic cable	оптоволоконний кабель

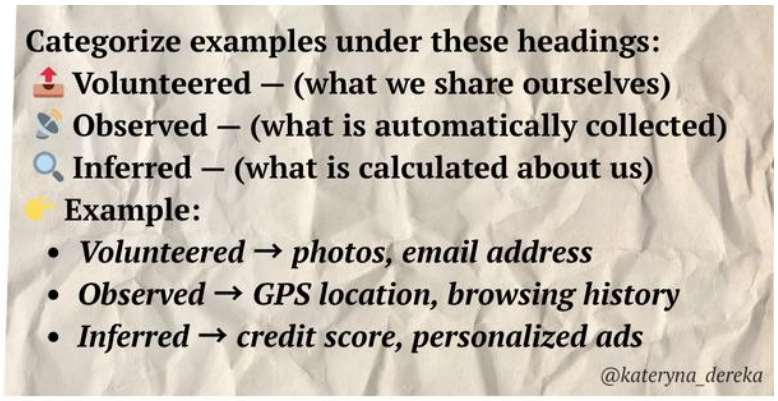
electromagnetic wave	електромагнітна хвиля
bandwidth	пропускна здатність
capacity	ємність, здатність передавати дані
throughput	реальна пропускна здатність, фактична швидкість передачі
flow	потік (даних)
latency	затримка (часова затримка передачі даних)

Task 1. Read the text and get ready to discuss it in the classroom.

Types of Personal Data

The following categories are used to classify types of personal data:

- **Volunteered data** - this is created and explicitly shared by individuals, such as social network profiles. This type of data might include video files, pictures, text or audio files.
- **Observed data** - this is captured by recording the actions of individuals, such as location data when using cell phones.
- **Inferred data** - this is data such as a credit score, which is based on analysis of volunteered or observed data.



The Bit

Did you know that computers and networks only work with binary digits, zeros and ones? Each bit can only have one of two possible values, 0 or 1. The term bit is an abbreviation of «**binary digit**» and represents the smallest piece of data. Humans interpret words and pictures, computers interpret only patterns of bits. Each group of eight bits, such as the representations of letters and numbers, is known as a byte.

Using the American Standard Code for Information Interchange (ASCII), each character is represented by eight bits. For example:

Capital letter: A = 01000001
Number: 9 = 00111001
Special character: # = 00100011

Common Methods of Data Transmission

After the data is transformed into a series of bits, it must be converted into signals that can be sent across the network media to its destination. Media refers to the physical medium on which the signals are transmitted. Examples of media are copper wire, fiber-optic cable, and electromagnetic waves through the air. A signal consists of electrical or optical patterns that are transmitted from one connected device to another.

There are three **common methods of signal transmission** used in networks:

- **Electrical signals** - Transmission is achieved by representing data as electrical pulses on copper wire.
- **Optical signals** - Transmission is achieved by converting the electrical signals into light pulses.
- **Wireless signals** - Transmission is achieved by using infrared, microwave, or radio waves through the air.

Bandwidth

Bandwidth is the capacity of a medium to carry data. Digital bandwidth measures the amount of data that can flow from one place to another in a given amount of time. Bandwidth is typically measured in the number of bits that (theoretically) can be sent across the media in a second.

Throughput

Like bandwidth, throughput is the measure of the transfer of bits across the media over a given period of time. However, due to a number of factors, throughput does not usually match the specified bandwidth. Many factors influence throughput including:

- The amount of data being sent and received over the connection.
- The types of data being transmitted.
- The latency created by the number of network devices encountered between source and destination.

Latency refers to the amount of time, including delays, for data to travel from one given point to another.

Task 2. Unscramble the words to make sentences.

1. willingly / that / create / social / and / share / their / profiles / Information / individuals / media / like
2. or / tracked / individuals / for / phones / data / activities / of / observing / by / obtained / Data / through / the / instance / location / behaviors / mobile
3. as / analysis / observed / Information / from / credit / score / data / person's / of / derived / or / a / volunteered / such
4. along / copper / Data / wires / conveyed / as / is / electrical / pulses
5. light / converting / by / signals / electrical / pulses / transmitted / into / Data / is
6. Transmission / waves / via / occurs / microwave / the / air / radio / through / infrared / or

_____

_____

_____

_____

_____

_____

_____

Task 3. Complete the text using the words or phrases from the box.

Nature network transmission data bandwidth volume medium connection

_____(1) denotes a medium's capability to transport _____(2). Digital bandwidth quantifies the _____(3) of data that can move between locations within a specific duration.

Throughput, akin to bandwidth, measures the _____(4) of bits across the _____ (5) within a defined timeframe. Several elements affect throughput, including:

- The volume of data exchanged over the _____(6).
- The _____(7) of the transmitted data.
- Latency introduced by the quantity of _____(8) devices encountered between the the source and destination.

Task 4. Match these words to their definitions.

1.observed data	
2. volunteered data	
3. wireless signals	
4. optical signals	
5. electrical signals	
6. binary digit	
7. inferred data	

a. transmissions of information in the form of electric currents or voltages.
b. a unit of digital information represented as either 0 or 1.
c. transmissions of data or information without the use of physical connections like wires or cables.
d. information collected through direct observation or monitoring of a subject or phenomenon.
e. conclusions drawn from existing information or evidence rather than directly observed facts.
f. information that is given willingly or freely by individuals for a specific purpose.
g. communications using light waves to transmit data or information.

Task 5. Rephrase the sentences using the phrases in the box.

• processes • inferred data • wireless signals • observed data • volunteered data •at high speeds

1. The researchers provided information from their study to back up their findings.
2. The scientist watched information from the experiment and noted the results.
3. Using the information at hand, the detective deduced details about the suspect's location.
4. The computer handles electrical signals to carry out different tasks.
5. Optical fibers transmit light signals quickly for communication.

_____

_____

_____

_____

Task 6. Scan Qr-code and do the Quiz in https://quizizz.com/ program.

Task 7. Write the correct definition.

_____- transmission is achieved by representing data as electrical pulses on copper wire.

_____ - transmission is achieved by using infrared, microwave, or radio waves through the air.

_____- transmission is achieved by converting the electrical signals into light pulses.

_____- this is data such as a credit score, which is based on analysis of volunteered or observed data.

_____- this is created and explicitly shared by individuals, such as social network profiles. This type of data might include video files, pictures, text or audio files.

_____- this is captured by recording the actions of individuals, such as location data when using cell phones.

Task 8. Complete the Conditional Sentences. Decide whether to use Type I or II.

1. If they go to Washington, they (see) _____ the White House.
2. If she (have) _____a hamster, she would call him Fred.
3. If he gave her a sweet, she (stop) _____ crying.
4. If he (arrive) _____ later, he will take a taxi.
5. We would understand him if he (speak) _____ slowly.
6. Andy (cook) _____ dinner if we buy the food.
7. I will prepare breakfast if I (wake up) _____ early.
8. If they shared a room, they (fight) _____ all day long.
9. If you hate walking in the mountains, you (enjoy / not) _____ the tour.
10. Janet would go jogging if she (have / not) _____ to do her homework.

Task 9. Scan Qr-code and do the task.

Task 10. Conditional Sentences type 1 and 2 - Fill in the correct forms of the verbs.

1. If a device _____ (not convert) bits into signals correctly, the data will not reach the receiver.
2. If the network had higher bandwidth, it _____ (transmit) data much faster.

3. Users will share more volunteered data if social networks _____ (offer) better privacy settings.
4. If you _____ (analyze) observed data, you could identify user patterns more accurately.
5. If copper cables _____ (be) damaged, electrical signals will not travel properly.
6. Throughput would increase if fewer devices _____ (compete) for the same network medium.
7. If a computer _____ (interpret) only patterns of bits, humans need encoding systems like ASCII.
8. If fiber-optic cables were used instead of copper wires, the signal _____ (be) more stable.
9. The system will generate inferred data if it _____ (process) enough volunteered information.
10. If wireless signals _____ (be) too weak, the connection would drop frequently.

Task 11. Scan Qr-code and do the tasks.

Term / Expression	Definition / Explanation
Personal data	Information that relates to an identified or identifiable person (e.g. name, email, address).
Volunteered data	Data that people intentionally share, such as social media posts or profile information.
Observed data	Data collected automatically by systems, like GPS location or browsing history.
Inferred data	Data generated by analyzing other data to draw conclusions (e.g. credit rating).
Bit	The smallest unit of digital information, which can have a value of 0 or 1.
Byte	A group of eight bits used to represent a character such as a letter or number.

Term / Expression	Definition / Explanation
ASCII (American Standard Code for Information Interchange)	A code system that represents text characters using binary numbers (e.g. A = 01000001).
Signal	An electrical, optical, or radio wave used to transmit data between devices.
Transmission	The process of sending data from one place to another through a medium.
Media (Transmission medium)	The physical path through which data travels, such as copper wire, optical fibre, or airwaves.
Electrical signals	Data sent as electrical pulses over copper cables.
Optical signals	Data transmitted as light pulses through optical fibre.
Wireless signals	Data transmitted through the air using radio, microwave, or infrared waves.
Bandwidth	The maximum amount of data that can be transmitted through a medium per second (measured in bits per second).
Throughput	The actual amount of data successfully transmitted over the network in a given time.
Latency	The time delay between sending and receiving data; how long it takes for data to travel between two points.
Data transmission speed	The rate at which information is sent from one device or system to another

Unit 8. Clients and Servers
The Infinitive

Questions for discussion:

1. What devices do you usually use to connect to the Internet?
2. Do you know what the difference is between a *client* and a *server*?
3. Have you ever shared files or printers between computers at home or in class?

Think and guess:

1. What do you think *P2P network* means?
2. Why do large companies use servers instead of peer-to-peer connections?
3. What could happen if all computers in a network acted as both *client* and *server*?

VOCABULARY	**Practise the following words and word combinations.**
To enable	дозволяти, забезпечувати можливість
To request	запитувати, робити запит
To obtain	отримувати
To provide	надавати, забезпечувати
Access	доступ
Wired	дротовий
Wireless	бездротовий
Advantage	перевага
Disadvantage	недолік
Scalable	масштабований, такий, що можна розширювати
Complex	складний
Secure	безпечний, захищений
Performance	продуктивність, робота системи
Intermediate devices	проміжні пристрої
file servers	файлові сервери
barcode scanners	сканери штрих-кодів
Security camera	камера спостереження / охоронна камера

Task 1. Scan Qr-code and work with new words, phrases and expressions in https://quizlet.com.

Task 2. Read the text. Find out new words and word-combinations.

Clients and Servers

Clients are computer hosts that have software installed that enables the hosts to request and display the information obtained from the server. Servers are hosts that have software installed which enable them to provide information, like email or web pages, to other hosts on the network.

Type	Description
Email	The email server runs email server software. Clients use mail client software, such as Microsoft Outlook, to access email on the server.

Web	The web server runs web server software. Clients use browser software, such as Windows Internet Explorer, to access web pages on the server.
File	The file server stores corporate and user files in a central location. The client devices access these files with client software such as the Windows File Explorer.

Peer-to-Peer Networks

In small businesses and homes, many computers function as the servers and clients on the network. This type of network is called a peer-to-peer (P2P) network. The simplest P2P network consists of two directly connected computers using either a wired or wireless connection.

Advantages of P2P:

- Easy to set up
- Less complex than other networks
- Lower cost because network devices and dedicated servers may not be required
- Can be used for simple tasks such as transferring files and sharing printers

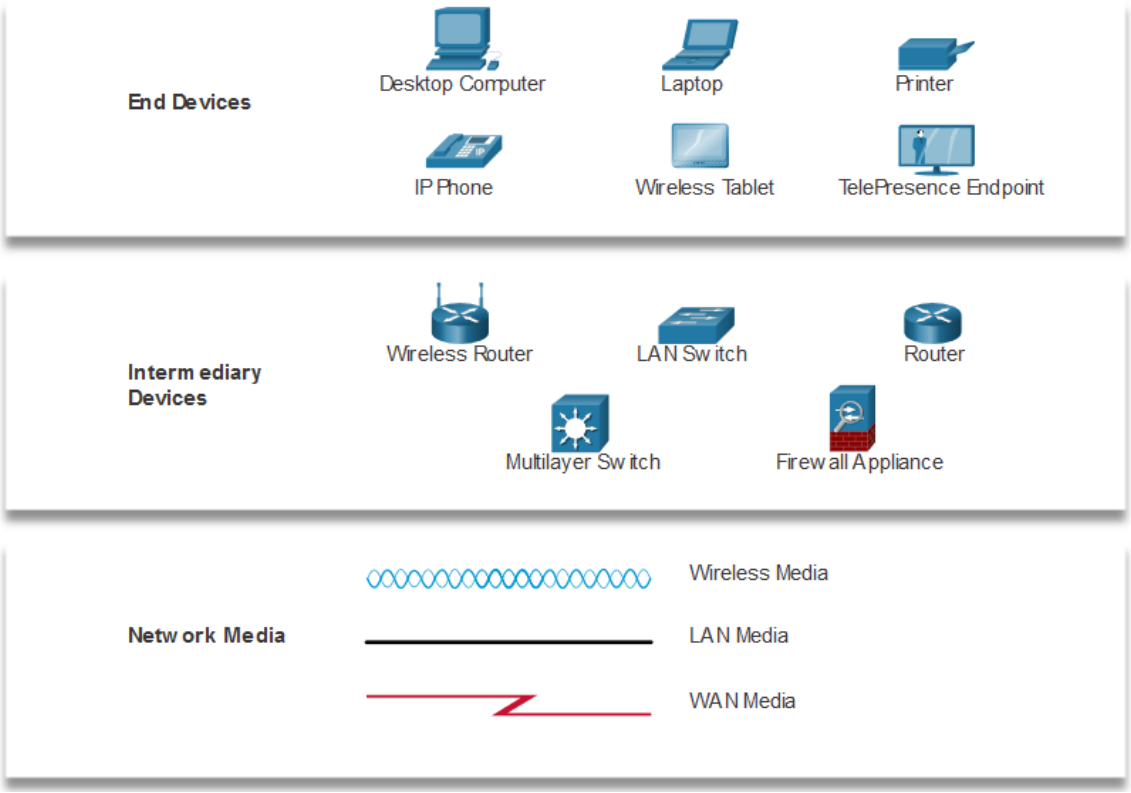
Disadvantages of P2P:

- No central administration
- Not as secure as other networks
- Not scalable
- All devices may act as both clients and server which can slow their performance

Network Components

The network infrastructure contains three categories of hardware components, as shown in the figure:

- End devices
- Intermediate devices
- Network media

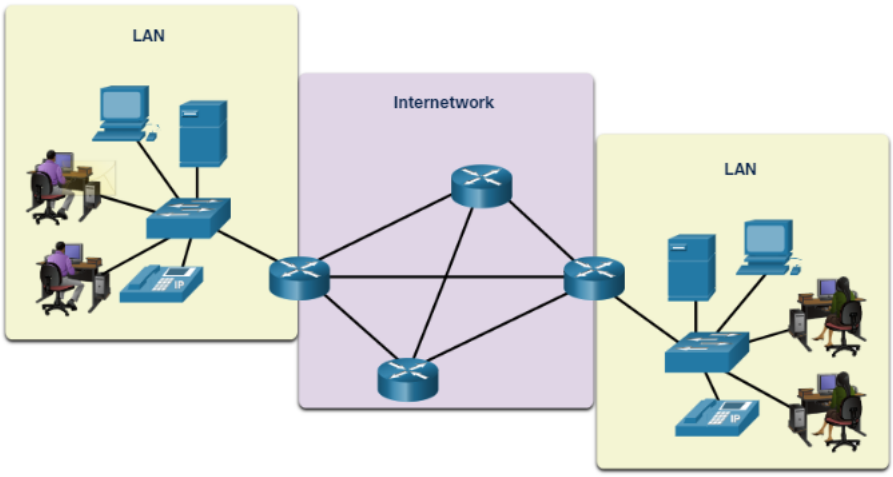


End Devices

The network devices that people are most familiar with are called end devices, or hosts. These devices form the interface between users and the underlying communication network.

Some examples of end devices are as follows:

- Computers (workstations, laptops, file servers, web servers)
- Network printers
- Telephones and teleconferencing equipment
- Security cameras
- Mobile devices (such as smart phones, tablets, PDAs, and wireless debit/credit card readers and barcode scanners)



Task 3. Match the halves.

1. teleconferencing		a. than other networks
2. End		b. to set up
3. Less complex		c. equipment
4. Network		d. devices
5. Security		e. printers
6. Network		f. cameras
7. Easy		g. media

Task 4. Choose the correct answer.

1. What is the main purpose of the networks that make up the internet according to the text above?

A. To provide entertainment and social media
B. To exchange information using common standards
C. To collect personal data
D. To connect individual devices

2. Which of the following is not considered a type of mobile device?

A. Smartphone
B. Tablet
C. Smart refrigerator
D. Smart glasses

3. According to the passage, which type of personal data is collected when a user's browsing history is tracked?

A. Volunteered data
B. Observed data
C. Inferred data
D. None of the above

4. What is the smallest unit of digital data?

A. Byte
B. Bit
C. Kilobyte
D. Megabyte

5. Which method of signal transmission is not mentioned as a common one used in networks in the text above?

A. Electrical signals
B. Optical signals
C. Wireless signals
D. Magnetic signals

6. Which factor is the primary determinant of network throughput?

A. The number of network devices
B. The amount of data being transmitted
C. The type of data being transmitted
D. All of the above

7. Where are users recommended to measure their network throughput?

A. Google.com
B. Facebook.com
C. Speedtest.net
D. YouTube.com

8. Which of the following elements is identified in the passage as a factor that can influence the throughput of a network connection?

A. The age of the network devices
B. The geographic distance between source and destination
C. The amount and type of data being transmitted
D. The number of users accessing the network

9. According to the passage, which of the following is NOT considered a type of mobile device?

A. Smartphone
B. Tablet
C. Smart watch
D. Smart TV

10. The passage mentions that networks can range in size from «small home» to «medium to large» corporate and educational networks. What type of network is described as being between these two extremes?

A. Internet service provider (ISP) networks
B. Wireless networks
C. Wired networks
D. SOHO (Small Office/Home Office) networks

Task 5. Choose and write the correct definition.

personal data	**bandwidth**	**optical signals**	**wireless signals**
throughput	**security cameras**	**tablet**	**smart appliances**
smart watches	**signal transmission**		

1. _____ the process of sending and receiving information through electronic signals.
2. _____ the rate at which data is successfully transferred between devices on a network.
3. _____ data sent and received without the need for physical cables or wires.
4. _____ a portable computer with a touchscreen display, typically larger than a smartphone.
5. _____ household devices connected to the internet that can be controlled remotely.
6. _____ data transmitted using light waves instead of electrical signals.
7. _____ wearable devices that can connect to your phone and provide notifications and tracking features.

8. _____ information about an individual that can be used to identify them, such as name, address, and phone number.
9. _____ devices that record video footage to monitor and protect homes or businesses.
10. _____ the amount of data that can be transmitted in a fixed amount of time over a network.

Task 6. Rephrase these sentences.

1. The new internet plan offers higher capacity for faster downloads.
2. The speed of the network significantly improved after the upgrade.
3. Fiber optic cables use light signals to transmit data over long distances.
4. Internet connection without physical cables is possible through wireless signals.
5. I use my portable device to read books and watch movies while traveling.
6. Fitness tracking and phone notifications can be provided by smart watches.
7. Safeguarding your personal information is crucial when using online services.

_____
_____
_____
_____
_____

Task 7. Complete the text using the words or phrases from the box.

wireless, throughput, eight, bandwidth, optical, small home networks, protocols, observed

The internet is a global network of interconnected systems collaborating to exchange information using standardized _____(1).

Various network types include _____ (2), SOHO setups, medium to large networks typical of corporations and schools, and the internet.

Personal data falls into categories of volunteered, _____ (3), and inferred.

Each bit can only represent either a 0 or a 1, with a byte consisting of _____(4) bits.

Network transmissions commonly employ three methods: electrical, _____ (5), and _____(6) signals.

_____ (7) is usually quantified by the number of bits theoretically transferable across the medium per second.

_____ (8) is influenced by factors such as data volume exchanged, the nature of transmitted data, and latency introduced by network device quantity between source and destination.

НЕОСОБОВІ ФОРМИ ДІЄСЛОВА (Non-finite Forms of the Verb)

В англійській мові (як і в українській) є також неособові (непредикативні) форми дієслова (Non-finite Forms of the Verb), тобто такі, що не вживаються в ролі присудка, але можуть входити до його складу. Це:

- ✓ інфінітив (The Infinitive),
- ✓ герундій (The Gerund),
- ✓ дієприкметник (The Participle).

Неособові форми дієслова:

- ✓ не мають граматичних ознак особи, числа і способу,
- ✓ не виражають часу дії (теперішнього, минулого чи майбутнього),
- ✓ лише вказують на співвіднесеність у часі, тобто чи є виражена ними дія одночасною з дією присудка, чи передує їй.

The Infinitive

We use the *to*-infinitive **after certain verbs**, particularly verbs of **thinking** and **feeling**:

Choose	*like*
Decide	*love*
Expect	*mean*
Forget	*plan*

Hate	*prefer*
Hope	*remember*
Intend	*want*
Learn	*would like/love*

*They **decided to** start a business together.*
***Remember to** turn the lights off.*

and verbs of **saying**:

agree promise refuse threaten

*We **agreed to** meet at the cinema.*
***Promise to** call me every day.*

Verb + object + *to* + infinitive	
After some verbs we use the structure **someone + to + infinitive.** Verbs which can be followed by this form include *want, warn, ask, tell, remind, would like, advise, allow, expect, encourage, force, help, invite, intend, order, persuade, need, would like/love, would prefer.*	*They **helped their neighbour to fix** his car.* *She **asked me to give** her some advice.* *He **told his assistant to send** the parcel.* *She **persuaded him to have** lunch with her.* *We **need someone to help** us.*
The negative form is **object** + *not* + *to* + **infinitive**. With *need*, *help* and *want* we use the standard negative of *don't*, *didn't*, etc.	*She **advised me not to sell** my house.* *She **told him not to do** it.* *I **don't need** you to help me, thanks.* @kateryna_dereka

Task 8. Unscramble the words in brackets to make a sentence with an infinitive.

1. It was a lovely day so we _____ to go swimming. (cdddeei)
2. We're_____ to get some theatre tickets if they're not too expensive. (ghinop)
3. Don't _____ to buy some bread on the way home. (efgort)
4. Max was very busy but he_____ to help his friends. (adeegr)
5. Karen _____ to bring her daughter a souvenir from Rome. (deimoprs)
6. The boss _____ to see you in his office. He's waiting for you now. (anstw)
7. I'm really tired. I _____ to go home now. (deikllouw) - *would like*
8. The teacher _____ the children to close their books and listen carefully. (adeks)
9. The film starts at six, so I _____everyone to be at the cinema at five thirty. (ldot)
10. We _____ our guests to arrive at about ten o'clock – if the traffic is good. (ceeptx)
11. My mother always _____me not to talk to strange men. (adenrw)
12. We _____our landlady not to increase the rent this year. (addeeprsu)

Infinitive of purpose

- We also use the ***to*-infinitive to express purpose** (to answer *why?*).
- We can also express purpose with ***in order to*** and ***in order not to*** or ***so as to*** and ***so as not to***:

*He locked the door **to keep** everyone out.*
*We started our journey early **in order to** avoid the traffic.*

- Sometimes the *to*-infinitive **gives a reason** for the adjective:

glad	*proud*
happy	*surprised*
pleased	*amazed*

*We were **happy to come** to the end of our journey.*
(= We were happy because we had come to the end of our journey.)
*John was **surprised to see** me.*
(= He was surprised because he saw me.)

- We often use ***it* + *be*** followed by an adjective to give opinions:

clever	*difficult*
easy	*nice*
possible	*impossible*

*It's **easy to play** the piano, but it's very **difficult to play** well.*
*He spoke so quickly that it was **impossible to understand** him.*

- We use the preposition ***for*** to show who these adjectives refer to:

difficult easy hard possible impossible
*It was **difficult for us to hear** what she was saying.*
*It is **easy for you to criticise** other people.*

- With the other adjectives, we use **the preposition *of***:

*It's **kind of you to help**.*
*It would be **silly of him to spend** all his money.*

Verb + bare infinitive	
We use the **bare infinitive** (an infinitive without to) after **modal verbs:** can, should, could, might, may, will, would, shall, must.	*It **might be** a good idea.* ***Could** you tell me?* *He **must be** crazy!* *Shall I wait here?*
We also see the bare infinitive after **need** and **dare** (when they are used as modal verbs), and after **had better.**	*I **daren't** do it. = I'm afraid to do it.* ***Need** I say more? = Do I have to say more?* *You **had better** hurry or you'll be late.* *= You should hurry.*
We use the **bare infinitive** after certain verbs followed by an object. These verbs include ***let, make, see, hear*** and ***feel***. After verbs of the senses such as **see** and **hear** we often use an object and the bare infinitive.	***Let** me **show** you my new laptop.* *We **let** him **speak** for as long as he wanted.* *Did you **see anyone enter** the building?* *He **made me laugh**.* *I didn't **see him score** the goal.* *I **heard her lock** the door.* @kateryna_dereka

Task 9. Match the expressions to make eight sentences.

1. John's gone to the cash machine	a. so as to remember to buy him a present.
2. I looked on Wikipedia	b. to get some money.
3. Next weekend I'm going to Newcastle	c. so as not to be late for an important meeting.
4. I'm going to the post office	d. in order not to forget to post it the next day.
5. She wore a heavy coat	e. to pick up a parcel.
6. He wrote Paul's birthday in his diary	f. in order to keep warm.
7. I put the letter on the table near the front door	g. to see my grandmother.
8. I went to work early today	h. to find the answer.

1	2	3	4	5	6	7	8

Task 10. Match the halves.

A	B
It's amazing	to see how fast the internet has developed.
It's dangerous	to open unknown email attachments.
It's unnecessary	to print every document.
It's polite	to thank your team for their help.
It's useful	to know how to configure a router.

Task 11. Write the correct answer in the following sentences.

1. The estate agent persuaded him _____ (sell) his house for a very low price.
2. I need someone _____ (help) me carry these bags to the car.
3. My financial adviser advised me _____ (not invest) my money in shares.
4. Let me _____ introduce) myself – I'm Patrick. I'm from New York.
5. Our maths teacher always made us _____ (do) extra homework if we failed a test.
6. Our maths teacher always forced us _____ (do) extra homework if we failed a test.
7. Johnny asked his dad _____(fix) his bike for him.
8. The shop assistant saw him_____ (steal) the book.
9. Because of the lack of labour, the government is allowing foreign workers _____ (enter) the country on a free 6-month visa.
10. My neighbour helped me_____ (paint) only the garden fence.
11. I don't want you _____ (come) with me. I'm going alone.
12. I didn't expect Anna _____ (accept) my invitation. I was surprised that she came to the party.
13. Marta's mother won't let her _____ (go) to school alone: she always walks there with her.

Task 12. Insert the particle «to» where necessary.

1. I'd like_____ dance.
2. She made me_____ repeat my words several times.
3. I saw him _____ enter the room.
4. She did not let her mother_____ go away.
5. Do you like_____ listen to good music?
6. Would you like _____ listen to good music?
7. That funny scene made me _____ laugh.
8. I like_____ play the guitar.
9. My brother can _____ speak French.
10. We had _____ put on our overcoats because it was cold.
11. They wanted _____ cross the river.
12. It is high time for you _____go to bed.
13. May I_____ use your telephone?
14. They heard the girl_____ cry out with joy.
15. I would rather _____ stay at home today.

Task 13. Replace the selected parts of the sentences using infinitive.

• E.g. The boss had many documents **which he could cope with.**
The boss had many documents **to cope with.**

1. Here is something **which will warm you up.**
2. Here are some more facts **which will prove** that your theory is correct.
3. Here is something **which you can rub on your hands**. It will soften them.
4. Here are some screws **with which you can fasten the shelves to the wall**.
5. Here are some tablets **which will relieve your headache.**
6. Here are some articles **which must be translated for tomorrow.**
7. Soon we found that there was another complicated problem **that we were to consider.**

Task 14. Scan Qr-code and do the tasks.

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GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
client	A computer or software that requests services or data from a server.
server	A computer or software that provides information or services to other devices on the network.
email server	A server that stores and manages users' email messages.

Term / Expression	Definition / Explanation
web server	A server that delivers web pages to clients via a browser.
file server	A server that stores and manages access to shared files.
peer-to-peer (P2P) network	A network in which each computer can act as both a client and a server.
end device	A device used directly by an end user, such as a computer, smartphone, or printer.
intermediate device	A device that connects and controls traffic between end devices (e.g. routers, switches).
network media	The physical channel used to transmit data (e.g. cables, wireless signals).
host	Any device connected to a network that can send or receive data.
network printer	A printer connected to a network and available to multiple users.
mobile device	A portable computing device like a smartphone or tablet.
scalable	Able to grow and handle increased demand.
secure	Protected from unauthorized access or harm.
set up	To install or configure a network or system.
wired / wireless connection	Connection using physical cables / radio signals.

Unit 9. Routing Between Networks Infinitive. Complex Object

Questions for discussion:

1. What is router? What is the primary function of routers?
2. Do you know the advantages and disadvantages of LANs?

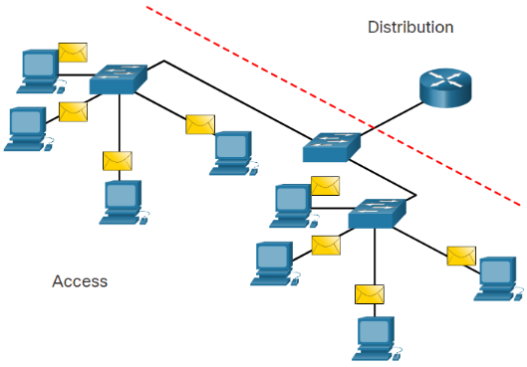
VOCABULARY	Practise the following words and word combinations.
Broadcast	широкомовна передача, трансляція
Router	маршрутизатор
Switcher (Switch)	комутатор

Host	вузол мережі, хост
Excessive	надмірний
To separate	розділяти
To protect	захищати
Distribution layer	розподільний рівень
Common needs	спільні потреби
LAN (Local Area Network)	локальна мережа
Appropriate	відповідний
Complexity	складність
Network cost	вартість мережі
Slow traffic	повільний трафік
Routing table	таблиця маршрутизації
Forwarding packets	пересилання пакетів
Implement	впроваджувати, реалізовувати

Routing Between Networks

Criteria for Dividing the Local Network

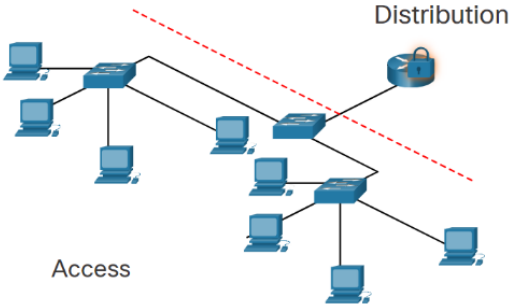
Broadcast Containment

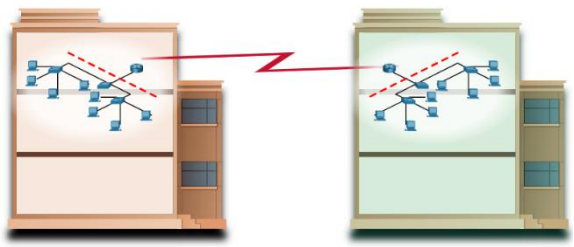


Routers in the distribution layer can limit broadcasts to the local network where they need to be heard. Although broadcasts are necessary, too many hosts connected on the same local network can generate excessive broadcast traffic and slow down the network.

Security

Routers in the distribution layer can separate and protect certain groups of computers where confidential information resides. Routers can also hide the addresses of internal computers from the outside world to help prevent attacks, and control who can get into or out of the local network.



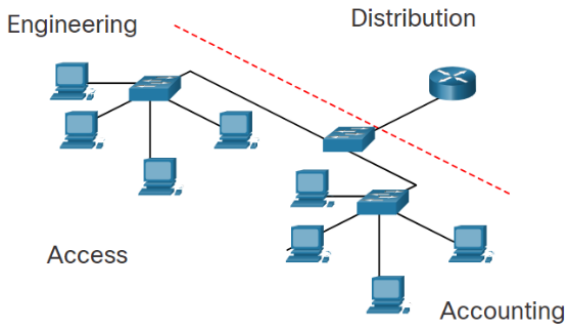


Locations

Routers in the distribution layer can be used to interconnect local networks at various locations of an organization that are geographically separated.

Logical Grouping

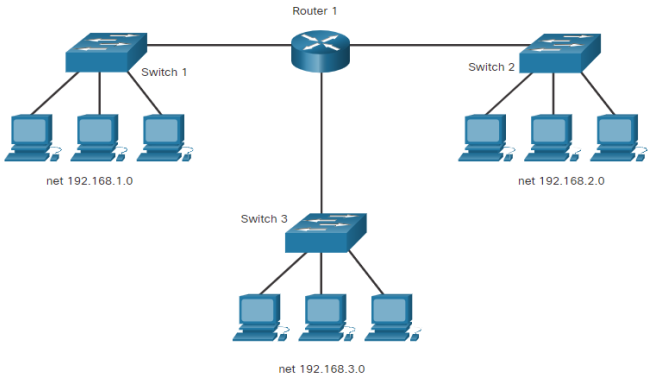
Routers in the distribution layer can be used to logically group users, such as departments within a company, who have common needs or for access to resources.



Create a LAN

Local Area Networks

- LANs are under one administrative control.
- LANs are usually either wired Ethernet or wireless.



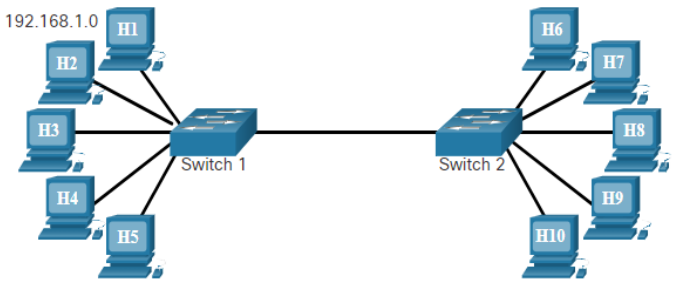
Local and Remote Network Segments

Advantages of a <u>single local segment</u>:

- Appropriate for simpler networks
- Less complexity and lower network cost
- Allows devices to be "seen" by other devices
- Faster data transfer - more direct communication
- Ease of device access

Disadvantages of a <u>single local segment</u>:

- All hosts are in one broadcast domain which causes more traffic on the segment and may slow network performance
- Harder to implement QoS
- Harder to implement security



All Hosts in One Local Segment

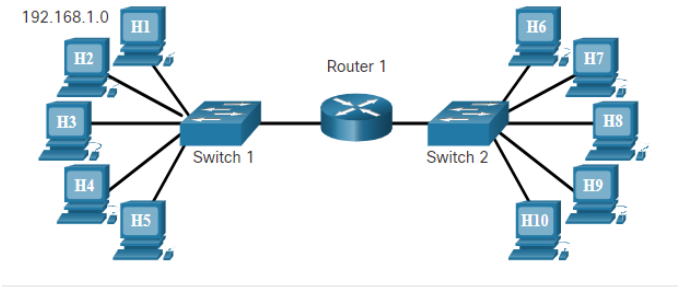
Advantages of having <u>hosts on a remote segment</u>

- More appropriate for larger, more complex networks
- Splits up broadcast domains and decreases traffic
- Can improve performance on each segment
- Makes the machines invisible to those on other local network segments

- Can provide increased security
- Can improve network organization

Disadvantages of having <u>hosts on a remote segment</u>

- Requires the use of routing (distribution layer)
- Router can slow traffic between segments
- More complexity and expense (requires a router)



Hosts on a Remote Segment

Task 1. Match the halves.

1. local area		a. table
2. administrative		b. route
3. default		c. packets
4. router		d. interface
5. routing		e. network
6. forwarding		f. control
7. network		g. administrator

Task 2. Choose and write the correct definition.

network administrator local area network to switch data transfer to broadcast a routing a routing table a router

1. _____ a method of sending data to all devices on a network at the same time.
2. _____ a person responsible for managing and maintaining a computer network
3. _____the process of selecting the best path for data packets to travel from one network to another
4. _____a database in a router that stores information about the best paths for forwarding data packets
5. _____a network that connects computers and devices in a limited geographical area, such as a home or office building
6. _____a device used to connect multiple devices within a local area network
7. _____ the process of moving data from one location to another
8. _____ device that forwards data packets between computer networks

Task 3. Fill in the blanks to make sentences.

data transfer technician switch traffic broadcast wireles local area network routing router

1. My_____ (1) is connected to the modem to provide Wi-Fi in my house.
2. A _____(2) is used to connect multiple devices together in a network.
3. The _____(3) is checking the routing table to troubleshoot network issues.
4. _____(4) helps data packets find the best path to their destination.
5. Our _____(5) allows us to share files between computers.
6. _____(6) speeds are important for streaming videos online.
7. _____(7) messages are sent to all devices on the network.
8. We have a _____(8)s printer that can be accessed from any device.
9. Slow _____(9) on the network could be caused by congestion or a faulty device.

Task 4. Choose the correct answer.

1. What is the primary purpose of using routers in the distribution layer to limit broadcasts?

A. To improve network speed
B. To enhance security
C. To reduce excessive broadcast traffic
D. To provide logical grouping of users

2. How do routers in the distribution layer help protect confidential information?

A. By hiding the addresses of internal computers
B. By connecting geographically separated locations
C. By improving network speed
D. By logically grouping users

3. What is the main benefit of using routers to interconnect local networks at different locations of an organization?

A. To improve network security
B. To enhance logical grouping of users
C. To provide broadcast containment
D. To connect geographically separated locations

4. Which of the following is a way that routers in the distribution layer can be used for logical grouping of users?

A. Grouping users based on their physical location
B. Grouping users based on their department or common needs
C. Grouping users based on their device type
D. Grouping users based on their access to resources

5. Which of the following is NOT a reason for using routers in the distribution layer?

A. Broadcast containment
B. Security
C. Connecting devices
D. Logical grouping

6. How do routers in the distribution layer help enhance security?

A. By limiting broadcast traffic
B. By separating and protecting certain groups of computers
C. By interconnecting local networks at various locations
D. By logically grouping users

7. What is the primary function of routers in the distribution layer in terms of logical grouping of users?

A. Grouping users based on their physical location
B. Grouping users based on their department or common needs
C. Grouping users based on their device type
D. Grouping users based on their access to resources

Task 5. Unscramble the words.

utrore _____
aoctdrabs _____
hswetrci _____
nroktwe _____
tiiraecr _____
enarnilt _____
sbtounrditii _____
eocplmiytx _____
sierslew _____
tianpolietnemn _____
ipdvoer _____
rnoefempcar _____
stientndioa _____

Grammar Focus

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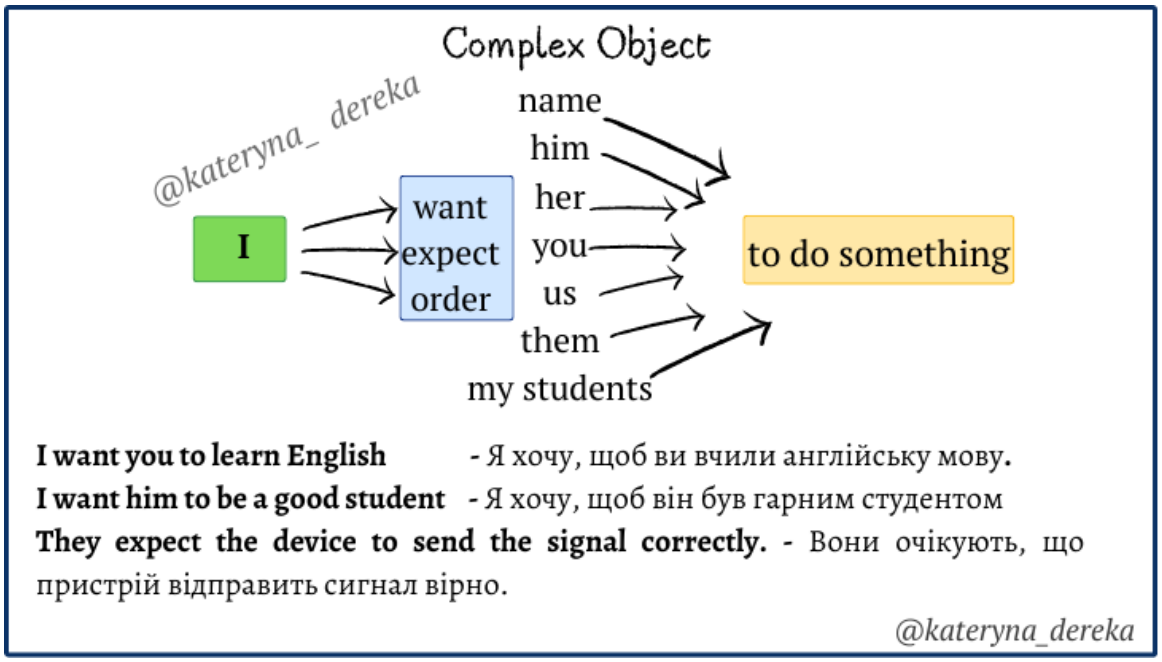

I want you to learn English - Я хочу, щоб ви вчили англійську мову.
I want him to be a good student - Я хочу, щоб він був гарним студентом
They expect the device to send the signal correctly. - Вони очікують, що пристрій відправить сигнал вірно.

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He wanted	**me**	**to improve**	**network speed**
	1 частина комплексу	2 частина комплексу	
	The **Objective Infinitive Complex**		

to see,
to hear,
to feel,
to watch,
to notice,
to observe

She **saw Mary** enter the password.

She **wanted them** to install the software again.

to order
to ask
to request
to allow
to permit
to advise
to recommend
to cause
to force
to make
to let

to want
to wish,
to desire;
to like,
to dislike
to hate
to intend
should/would like

to consider,
to believe
to think
to find
to know
to expect
to suppose

The teacher **allowed us** to use dictionaries.

We **consider him** to be the best student.

Complex Object

Група дієслів	Дієслова	Формула	Приклади
Бажання, наміри, очікування	want, expect, would like, need, allow, ask	**N/Pronoun + to + V**	We want the network **to run** faster. / The company expects the developers **to fix** the bug.
Спостереження	see, watch, observe, notice, hear	**N/Pronoun + V (без to)** або **V-ing**	I saw the system **restart**. / They observed the network **failing** during the test.
Примус / дозвіл	let, make, have	**N/Pronoun + V (без to)**	The admin made the interns **install** the updates. / The platform lets users **upload** large files.

The Ukrainian equivalent of **let smb do smth is** — дозволити;
of **make smb do smth** — змусити.

- ✓ *I let them use dictionaries.* Я дозволяю їм користуватися словниками.
- ✓ *I made them use dictionaries.* Я змусив їх користуватися словниками.

Task 6. Paraphrase the following sentences so as to use a complex object after the verbs in brackets.

1. He will come by an early train (to expect).
2. She loses so much time in talking (not to want).
3. It's good advice (to believe).
4. She must see the doctor (to advise).
5. You must promise not to do such things again (to want).
6. You must teach him a lesson (to advise).
7. He won't be back so soon (not to expect).

Task 7. Complete the sentences with the correct form of the verb in brackets.

1. The manager wants the technicians _____ (install) the new router today.
2. We didn’t expect the connection _____ (drop) during the video call.
3. The teacher asked the students _____ (explain) the function of each network layer.
4. The company allowed users _____ (access) the database remotely.
5. I saw the engineer _____ (check) the cables in the server room.
6. They made the trainee _____ (repeat) the configuration process.
7. The client would like us _____ (send) the updated report.
8. The administrator helped the interns _____ (reset) the passwords.

Task 8. Scan Qr-code and do the Task.

Task 9. Complete the sentences with the correct form of the verb in brackets. Use the Complex Object structure (*object + infinitive / to-infinitive / bare infinitive*).

1. The network administrator wants the new router _____ (divide) the local network according to the given criteria.
2. Engineers expected the routing protocol _____ (contain) unnecessary broadcast traffic.
3. The manager made the technician _____ (check) all connections before configuration.
4. Security officers required the system _____ (encrypt) all transmitted data.
5. We saw the router _____ (forward) packets between two networks in real time.
6. The instructor told the students _____ (analyze) the routing table carefully.
7. Our supervisor didn't allow us _____ (change) the IP addressing scheme.
8. Everyone noticed the router _____ (detect) unauthorized access attempts.
9. The company wants all departments_____ (implement) new security policies.
10. The IT team helped the users _____ (understand) how broadcast containment improves network performance

Task 10. Rewrite the sentences so that they contain a Complex Object construction.
Example: Original: *The administrator said that the router should restart automatically.* → The administrator wanted the router to restart automatically

1. The manager said that engineers must check the routing table.
2. The instructor told students that they should configure static routes.
3. The network specialist said the router detected a broadcast storm.
4. Our boss said that the firewall must block all untrusted connections.
5. The IT director said the technicians have to implement new security rules.
6. The analyst told us that we should monitor latency between networks.
7. The customer said the system must isolate each subnet.
8. The teacher said that students should observe how packets are transmitted.

Task 11. Complete the sentences using Complex Object.

1. The manager wants the developers _____ (optimize) the code.
2. We saw the system _____ (freeze) during the update.
3. The admin allowed the users _____ (access) the shared folder.
4. The engineer heard the device _____ (beep) several times.
5. The client expects the website _____ (load) quickly on mobile devices.
6. The teacher made the students _____ (install) the antivirus software again.
7. I noticed the network _____ (drop) the connection.
8. The company needs the security team _____ (monitor) the data flow.
9. We watched the program _____ (compile) without errors.
10. The admin let the interns _____ (restart) the server.

Task 12. Translate into English.

1.Я знаю, що він дуже досвідчений програміст.
2. Ми очікуємо, що контракт буде укладений в найближчому майбутньому.
3. Я очікував, що мене запросять туди.
4. Він не очікував, що його запитають про це.
5. Ми знали, що вони досить досвідчені, щоб зробити цю роботу.
6. Я вважаю, що він правий.

Term / Expression	Definition / Explanation
Router	A network device that forwards data packets between computer networks. It directs traffic and connects different network segments.
Distribution layer	The part of a network that connects access networks (like LANs) and manages routing, filtering, and network policies.
Broadcast	A network message sent to all devices in a local area network. Useful for discovery, but too many broadcasts can cause congestion.
Broadcast containment	The process of limiting broadcast traffic to a specific area of the network to improve performance.
Local network (LAN)	A Local Area Network, a network that connects computers and devices within a limited area (like an office or school).
Confidential information	Sensitive data that must be protected from unauthorized access.
Internal computers	Computers or devices that are part of a private network and not directly accessible from the internet.
Security	The practice of protecting network data and resources from unauthorized access or attacks.
Address hiding (NAT)	A security method that hides internal IP addresses from external users, using a router or firewall.
Access control	A network security technique that defines who is allowed to connect to or use specific network resources.
Geographically separated locations	Different physical sites or buildings that are connected through a network.

Term / Expression	Definition / Explanation
Logical grouping	Organizing users or devices into virtual groups (e.g., departments) based on function or access needs, not physical location.
Administrative control	The management and configuration of a network by a single authority or IT department.
Ethernet	A wired networking technology used in most LANs to connect computers using cables.
Wireless (Wi-Fi)	A technology that allows computers and devices to connect to a network without physical cables.
Network segment	A part of a larger network separated by routers or switches, used to organize traffic and reduce congestion.
QoS (Quality of Service)	A method to manage network resources and prioritize certain types of data (e.g., video calls over downloads).
Broadcast domain	A part of a network where any broadcast sent by a device can be received by all other devices in the same domain.
Performance	The overall efficiency and speed of a network in processing and transmitting data

Unit 10. Network Layers and Communication. The Infinitive

Questions for discussion:

1. How do computers communicate with each other?
2. What happens when you send a message or an email?
3. Can you imagine the Internet without network layers? What would go wrong?
4. Why do you think communication between devices needs rules or “protocols”?
5. Have you ever experienced a slow network connection? What might be happening in the background?

Scan and Learn

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A network has three layers of components

- consists of computer programs that interface with network users
- permit the sharing of information, such as files, graphics, and video, and resources, such as printers and disks)

1. application software

Client-server application software

Client computers
- send requests for information
- requests to use resources to other computers, called servers that control data and applications

Peer-to-peer application software

Computers send messages and requests directly to one another without a server intermediary

- consists of computer programs that establish **protocols**, or rules, for computers to talk to one another

2. network software

protocols, are carried out by sending and receiving formatted instructions of data called packets

Protocols:
- make logical connections between network applications;
- direct the movement of packets through the physical network;
- minimize the possibility of collisions between packets sent at the same time

3. network hardware

Made up of the physical components that connect computers packets

Important components

1. The **transmission media** that carry the computer's signals, typically on wires or fiber-optic cables

Important components

2. The **network adapter:**
   a) accesses the physical media that link computers
   b) receives packets from network software
   c) transmits instructions and requests to other computers.

Two types of Network Connections

Physical connections
that let computers directly transmit and receive signals

Logical, or virtual, connections
that allow computer applications, such as word processors, to exchange information

Physical connections are defined by:
- **the medium** used to carry the signal
- the geometric arrangement of the computers (**topology**)
- the method used to **share information**

Logical connections are created by network protocols and allow data sharing between applications on different types of computers, such as an Apple Macintosh and an International Business Machines Corporation (IBM) personal computer (PC), in a network

The medium used to transmit information limits
- Copper wires and coaxial cable provide transmission speeds of a few thousand bits per second for long distances and about 100 million bits per second (Mbps) for short distances.
- Optical fibers carry 100 million to 1 billion bits of information per second over long distances.

Common **topologies** used to arrange computers in a network are **point-to-point, bus, star, ring**

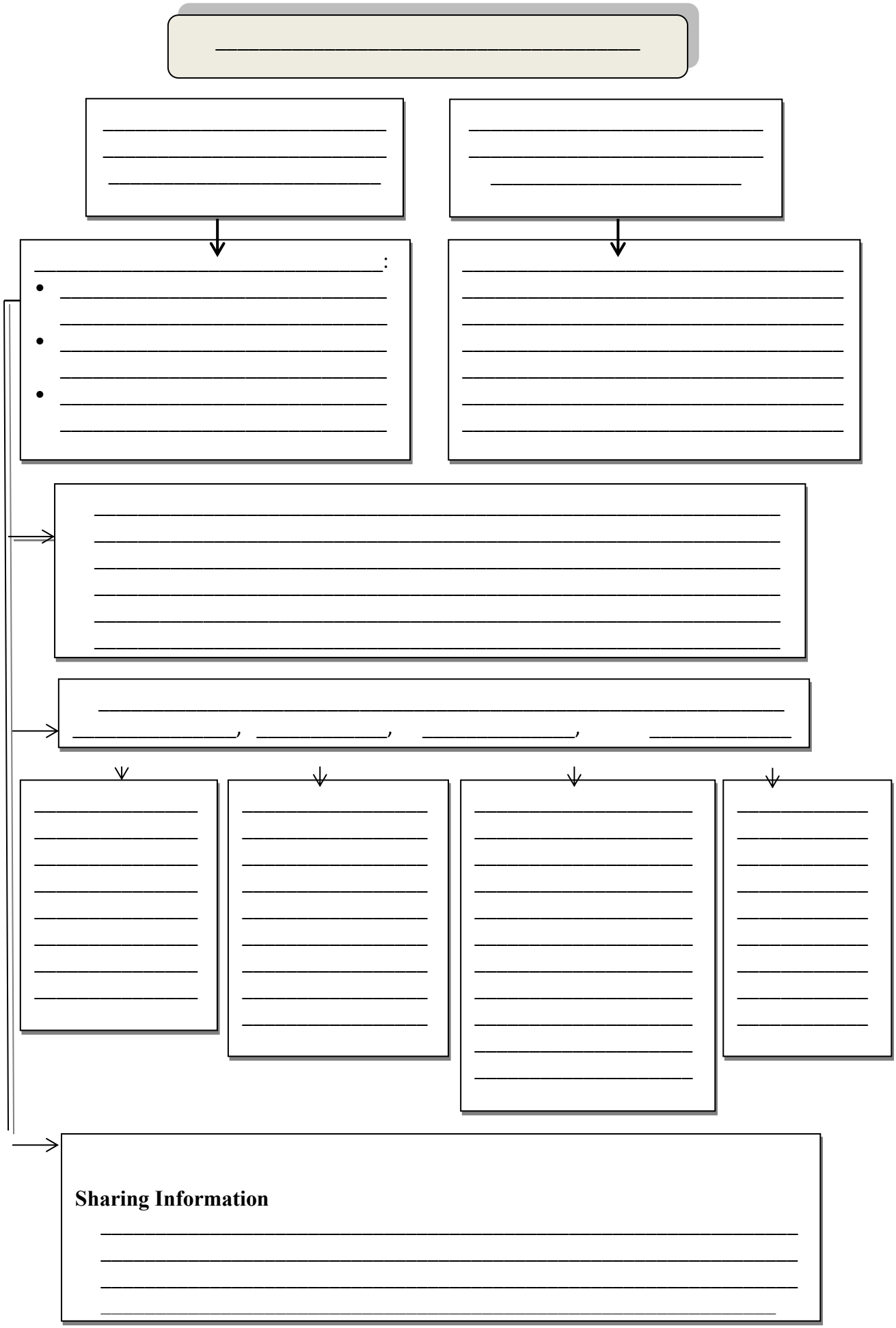
Point-to-point topology is the simplest, consisting of two connected computers

The bus topology is composed of a single link connected to many computers. All computers on this common connection receive all signals transmitted by any attached computer.

The star topology connects many computers to a common hub computer. This hub can be passive, repeating any input to all computers similar to the bus topology, or it can be active, selectively switching inputs to specific destination computers.

The ring topology uses multiple links to form a circle of computers.

Sharing Information
When computers share physical connections to transmit information packets, a set of Media Access Control (MAC) protocols are used to allow information to flow smoothly through the network.



Sharing Information

Task 1. Match the term with its definition.

1. Application software
2. Network software
3. Network hardware
4. Packet
5. Protocol
6. Transmission media
7. Network adapter
8. Topology
9. Physical connection
10. Logical connection

A. Rules that allow systems to communicate over a network
B. The way computers are arranged in a network
C. Wires or cables that carry data signals
D. Equipment that connects computers in a network
E. Virtual link that allows apps to share data
F. Physical method of linking computers
G. Small unit of formatted data sent across a network
H. Software that interacts with users and allows file/resource sharing
I. Program that manages data exchange between devices
J. A device that accesses the medium and transmits/receives data

Task 2. Fill in the gaps with terms from the box.

application software, network software, network hardware, protocols, packet, topology, logical connections, physical connections, media access control, transmission media

1. _____ are the rules that define how computers communicate.
2. A _____ is a small formatted unit of data transmitted across a network.
3. _____ allow applications on different devices to exchange data.
4. _____ such as cables carry the signals between computers.
5. A _____ describes the physical arrangement of computers.
6. _____ such as word processors run on the user's side.
7. _____ define the wiring and direct signal exchange.
8. A _____ protocol ensures information flows without collision.
9. _____ is the actual equipment used for networking.
10. _____ helps programs know how to exchange data with others.

Task 3. Complete the sentences with the correct passive form.

1. Packets _____ (send) through the network hardware.
2. The hub _____ (connect) to multiple computers.
3. Data _____ (carry) by copper wires or fiber optics.
4. Topologies _____ (use) to organize networks.

5. Protocols _____ (establish) by network software.
6. The MAC protocols _____ (design) to avoid collisions.
7. A signal _____ (not/transmit) if the cable is damaged.
8. This system _____ (configure) for logical connections.
9. Packets _____ (receive) by network adapters.
10. New software _____ (install) last week.

Task 4. Complete the sentences with the correct verb forms using Second Conditional.

1. If the topology _____ (be) a ring, the signal _____ (travel) in a circle.
2. If we_____(use) optical fiber, the network speed _____ (increase).
3. The software _____ (crash) if it _____(be) not compatible with the hardware.
4. If the MAC protocols _____ (fail), packets _____ (collide).
5. If the network adapter _____ (be) missing, the computer _____ (not/connect).
6. Logical connections _____ (not/work) if protocols _____ (not be) established.
7. If we _____ (replace) the wires, we _____ (get) better transmission speed.
8. If the packet _____ (be) lost, the system _____ (send) it again.
9. If a bus topology _____ (be) used, all devices _____ (share) the same line.
10. You _____ (need) a hub if using a star topology.

Task 5. Complete the sentences with the correct form of the infinitive.

1. The administrator wants the users _____ (access) the shared folder.
2. The teacher asked the students _____ (explain) how data moves across the network.
3. The company expects the new system _____ (improve) communication speed.
4. We saw the technician _____ (check) the Ethernet cable connection.
5. They believe the server _____ (be) down due to maintenance.
6. The manager made the engineers _____ (test) the new router settings.
7. The instructor told us _____ (create) a diagram of the OSI model.
8. Our supervisor noticed the connection _____ (drop) during video transmission.
9. The team helped the junior specialist _____ (install) the network driver.
10. The users reported the system _____ (send) wrong data packets.

Task 6.

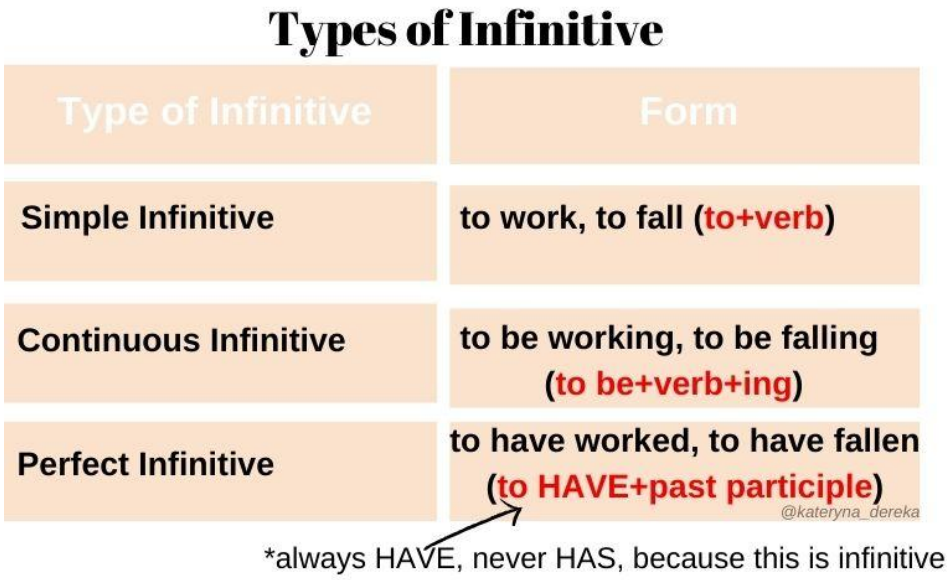
"Imagine you are designing a smart home network for a family of five. In 150–200 words (or in a labeled diagram), describe the following:"

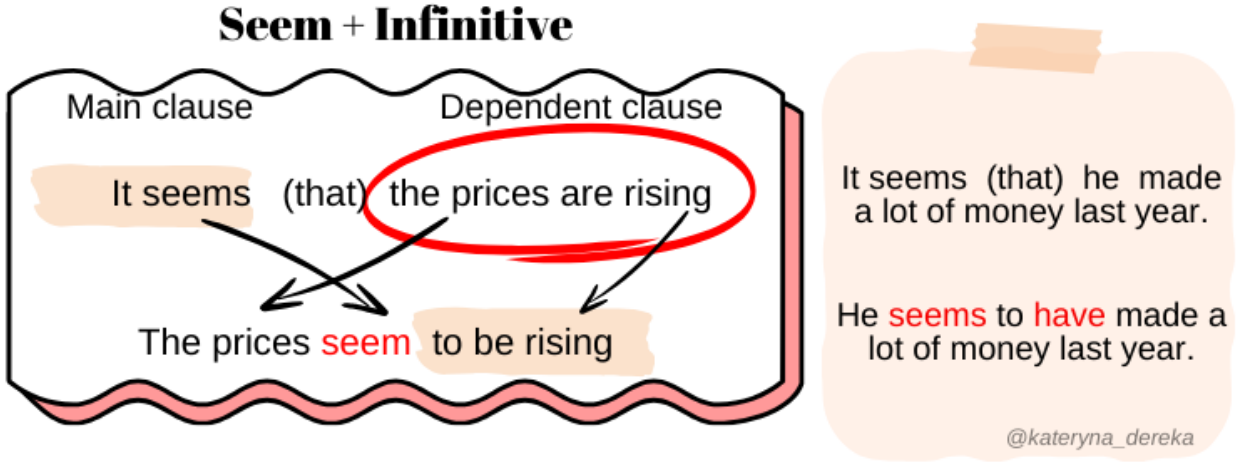
- Which **network topology** you would use and why;
- Which **devices** would be connected to the network (e.g. printer, lights, smart fridge);
- What **transmission media** you would choose (e.g. fiber optics, copper cables, Wi-Fi);
- How **application software** and **network protocols** would help the family share resources and stay connected.

Optional formats:

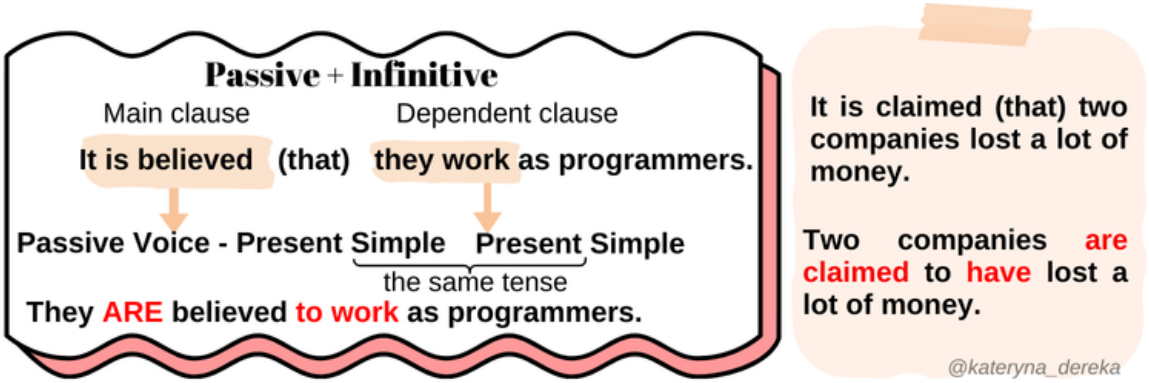
📝 A short written description (essay-style)

📊 A labeled diagram or infographic with brief explanations





The **subject** of the dependent clause goes first. Then write '**seem**' in the same tense as in the main clause and the **verb** from the dependent clause.
If the verb in the dependent clause is in the "**older**" **tense** than the verb in the main clause - use the **Perfect Infinitive.**



Task 7. Complete the sentences with the correct form of the passive infinitive. Used after verbs such as *expect, want, need, intend, hope, plan, ask, tell, seem, appear, be supposed, be expected,* etc.

1. The new software is expected _____ (release) next month.
2. This program seems _____ (design) for beginners.
3. The students hope _____ (give) more practical tasks.
4. The files need _____ (protect) with a password.
5. The system is said _____ (test) by several IT companies.
6. The issue is likely _____ (solve) soon.
7. The website was supposed _____ (update) yesterday.
8. The data must _____ (store) securely.

Task 8. Choose the correct form of the infinitive:

1. The CPU seems _____ (work / to work / to be working) faster after the upgrade.
2. This file seems _____ (delete / to delete / to have been deleted).
3. The students seem _____ (understand / to understand) the topic clearly.
4. The router seems _____ (to fail / to have failed) due to overheating.
5. The programmer seemed _____ (to fix / to have fixed) the bug successfully.
6. The server seems _____ (to be / be / is) under maintenance.
7. The results seem _____ (to improve / to have improved) over the last few weeks.
8. The application seems _____ (to develop / to have been developed) by a skilled team.

Task 9. Fill in the blanks using the correct passive infinitive form.

1. The devices are expected _____ (connect) automatically.
2. The students hope _____ (give) more practice on network configuration.
3. The files need _____ (protect) with a stronger password.
4. The data is likely _____ (transfer) within seconds.
5. The new equipment is supposed _____ (deliver) tomorrow.

GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
Network	A group of computers and devices connected together to share data, resources, and services.
Computer network	A system that allows computers to communicate and exchange information through wired or wireless connections.
Node	Any device (computer, printer, router, etc.) connected to a network.
Host	A computer or other device that provides data, services, or applications to other devices on a network.
Client	A computer or program that requests services or data from another computer (the server).
Server	A computer that provides services, resources, or data to other devices on the network.
Network topology	The physical or logical layout of a network — how devices are arranged and connected (e.g., star, bus, ring, mesh).
Physical connection	The actual hardware links between devices, such as cables, switches, or wireless signals. It shows how devices are physically connected.
Logical connection	The virtual or software-based relationship between devices that defines how data flows, regardless of the physical layout.
Network interface card (NIC)	Hardware that allows a computer to connect to a network, either wired or wireless.
Transmission media	The physical materials or channels used to transmit data — e.g., copper cables, fiber-optic cables, or radio waves.
Switch	A device that connects multiple computers on a network and directs data only to the specific device that needs it.
Router	A device that connects different networks together and directs data packets between them.
Hub	A simple network device that sends incoming data to all connected devices, without filtering or directing it.
Wireless network	A network that connects devices using radio signals (Wi-Fi) instead of physical cables.
Ethernet	A common wired networking technology used for local area networks (LANs).

Term / Expression	Definition / Explanation
LAN (Local Area Network)	A network that connects computers in a small area, like a school, home, or office.
WAN (Wide Area Network)	A large network that connects multiple LANs over long distances — e.g., the Internet.
Internet	A global system of interconnected networks that allows worldwide communication and data sharing.
Protocol	A set of rules that determine how data is transmitted and received over a network (e.g., TCP/IP, HTTP).
IP address	A unique number assigned to each device connected to a network, used for identification and communication.
MAC address	A unique hardware address assigned to a network interface card (NIC). It identifies a device within a local network.
Data transmission	The process of sending and receiving data across a network.
Bandwidth	The maximum amount of data that can be transmitted over a network connection in a given time, usually measured in bits per second (bps).
Throughput	The actual rate of successful data transfer over a network connection.
Latency	The delay between sending and receiving data in a network.
Network segment	A part of a network separated by a device (like a router or switch) to improve performance or organization.
Network interface	The point where a device connects to a network, usually through a port, cable, or wireless adapter.

Unit 11. Data processing and Data processing systems. Present Perfect and Past Simple

LEAD_IN

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Questions for discussion:

1. Have you ever thought about how raw data becomes useful information?
2. What happens between typing data into a computer and seeing results on the screen?
3. Why is data processing essential for modern businesses, healthcare, or education?
4. Can you name everyday examples of data processing (e.g., ATMs, online shopping, mobile apps)?
5. What could happen if data processing systems stopped working for one day?

Look at the sequence:
→ People entering data → Computer analyzing it → Graphs and reports appearing.

"What processes did you just see? What do you think each step is called?"

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Task 1. Scan Qr-code and practise new words and phrases in https://quizlet.com.

VOCABULARY Practise the following words and word combinations.

Key Phrases and Terms	
Data processing	обробка даних
Data processing system	система обробки даних
Useful information	корисна інформація
Collection of facts	сукупність фактів
To convert inputs into outputs	перетворювати вхідні дані у вихідні
Series of actions or operations	послідовність дій або операцій
Input / Inputting	введення даних
Storing	зберігання
Processing	оброблення
Output / Outputting	виведення інформації

Controlling	контроль виконання
Resources	ресурси
Facilities	приміщення, обладнання
Equipment	устаткування
Operator	оператор
Printed report	друкований звіт
Visual display	візуальне відображення
Logical operations	логічні операції
Arithmetic operations	арифметичні операції

Task 2. Read and translate the text.

DATA PROCESSING AND DATA PROCESSING SYSTEMS

The necessary data are processed by a computer to become useful information. **Data** are a collection of facts — unorganized but able to be organized into useful information. **Processing** is a series of actions or operations that convert inputs into outputs. When we speak of data processing, the input is data, and the output is useful information. So, we can define **data processing** as a series of actions or operations that converts data into useful information.

We use the term data processing system to include the resources that are used to accomplish the processing of data. There are four types of resources: people, materials, facilities, and equipment. People provide input to computers, operate them, and use their output. Materials, such as boxes of paper and printer ribbons, are consumed in great quantity. Facilities are required to house the computer equipment.

Basic data processing operations

Five basic operations are characteristic of all data processing systems: inputting, storing, processing, outputting, and controlling. They are defined as follows.

- *Inputting* is the process of entering data, which are collected facts, into a data processing system.
- *Storing* is saving data or information so that they are available for initial or for additional processing.
- *Processing* represents performing arithmetic or logical operations on data in order to convert them into useful information.
- *Outputting* is the process of producing useful information, such as a printed report or visual display.
- *Controlling* is directing the manner and sequence in which all of the above operations are performed.

Data storage hierarchy

It is known that data, once entered, are organized and stored in successively more comprehensive groupings. Generally, these groupings are called a data storage hierarchy. The general groupings of any data storage hierarchy are as follows.

1) *Characters,* which are all written language symbols: letters, numbers, and special symbols. 2) *Data elements,* which are meaningful collections of related characters. Data elements are also called data items or fields. 3) *Records,* which are collections of related data elements. 4) *Files,* which are collections of related records. A set of related files is called a **data base** or a data bank.

Task 3. Answer the questions.

1. What is processing?
2. What is data processing?
3. What does the term of data processing system mean?
4. What basic operations does a data processing system include?
5. What is inputting / storing / outputting information?

Task 4. Translate the word-combinations.

- Системи обробки інформації;
- послідовність дій;
- визначення (терміну) обробки даних;
- зберігання даних;
- забезпечувати введення інформації в комп'ютер;
- сукупність фактів;
- перетворення вхідних даних у корисну інформацію;
- зорове відображення;
- включати ресурси;
- завершити обробку даних;
- витрачати у великій кількості;
- розміщувати комп'ютерне обладнання
- введення даних;
- додаткова обробка;
- видача корисної інформації;
- надруковане повідомлення;

Task 5. Match the terms with their definitions.

1. Computer	a) the set of instructions that direct the operations of computers;
2. Computer literacy	b) a part of a computer, entering data into the device;
3. A program	c) facts unorganized but able to be organized;
4. Data	d) the output of a data processing system;
5. Data processing	e) possessing sufficient knowledge of how computers work and what they can do to use them as problem-solving tools;
6. Data processing	f) a series of operations that results in the conversion of data system into useful information;
7. Input	g) an electronic device performing calculations on numerical data;
8. Output	h) an electronic device accepting the data processing results from the computer and displaying them;
9. Useful information	i) a set of related files;
10. Data bank	j) the resources required to accomplish the processing of data. These resources are personnel, material, facilities and equipment.

1	2	3	4	5	6	7	8	9	10

Task 6. Choose the correct answer.

1. **What is the purpose of the controlling operation in data processing?**
   A. Producing useful information
   B. Directing the sequence of operations
   C. Entering data into the system
   D. Performing logical operations on data
2. **What is the process of performing arithmetic or logical operations on data?**
   A. Outputting
   B. Processing
   C. Storing
   D. Inputting
3. **What is a set of related files called?**
   A. Data elements
   B. Records
   C. Data processing system
   D. Data base
4. **Which of the following is NOT a type of resource in a data processing system?**
   A. Software
   B. Materials
   C. Facilities
   D. People

5. **What is data processing?**
    A. A series of actions that convert information into data
    B. A series of actions that convert data into useful information
    C. A process of organizing data into categories
    D. A method of storing data securely
6. **Which operation involves entering collected facts into a data processing system?**
    A. Storing
    B. Inputting
    C. Outputting
    D. Processing
7. **What does the storing operation in data processing involve?**
    A. Converting data into useful information
    B. Performing arithmetic operations on data
    C. Saving data for future processing
    D. Producing visual displays
8. **Which resource is required to house the computer equipment in a data processing system?**
    A. Facilities
    B. Equipment
    C. Materials
    D. People
9. **What is the general groupings of a data storage hierarchy?**
    A. Inputting, storing, processing, outputting
    B. People, materials, facilities, equipment
    C. Arithmetic, logical, controlling, directing
    D. Characters, data elements, records, files
10. **Which of the following is a collection of related data elements?**
    A. Files
    B. Data elements
    C. Records
    D. Characters

Task 7. Write the correct term to the definitions.

data processing	**controlling**	**storing**	**processing data**	**data processing system**	**outputting**

_____ a. the manipulation and organization of data to produce meaningful results.

_____ b. the act of performing operations on data to achieve a desired outcome.

_____ c. information that is collected and analyzed for a specific purpose.

_____ d. managing and directing the flow of data within a system.

_____ e. a combination of hardware and software used to process and manage data.

_____ f. the process of displaying or producing data in a usable format.

_____ g. the act of saving data in a storage device for future use.

Task 8. Scan Qr-code and do the Quiz in https://quizizz.com/ program.

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Grammar Focus

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PRESENT PERFECT TENSE	
We use the **Present Perfect** to talk about recent actions (an action that has **happened in the past** and has a **result** in the present) .	• I'**ve unplugged** the computer. • She **hasn't finished** the report. • **Has** she **switched off** the computer? • Yes, **she has**. / No, **she hasn't.** • **Have** you **checked** the cable connections? • Yes, **I have**. / No, **I haven't**
We use **have/has + past participle** of the verb. (To form the past participle of regular verbs, we add **-ed**).	**clean - cleaned** **work - worked**
Irregular past participles @kateryna_dereka	do - done be - been see-seen have - had make - made run -run

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Task 9. Scan Qr-code and revise the Present Perfect Tense by watching the presentation.

Task 10. Complete the sentences in Present Perfect Tense.

1. _____(you run) the computer in thr battery mode?
2. How long_____ (you have) the iPad?
3. _____ (you charge) the battery?
4. _____ (he open) the file?

5. _____ (she enter) the username and password?
6. _____ (they change) the Internet Service Provide?
7. _____ (you check) the remaining disk space?
8. _____ (you install) software recently?
9. _____ (John update) the drivers recently?

Task 11. Use Present Perfect Tense to make positive or negative sentences.

The screen / go/blank *The screen has gone blank.*

1. The charger / stop/ working. _____
2. I /not/ upgrde/ the operating system. _____
3. She / not/install/ the updates. _____
4. They /reinstall / the application. _____
5. She /not/ be able to fix the problem. _____
6. I /defragment/ your drive. _____

PRESENT PERFECT VS. PAST SIMPLE	
We use the **Present Perfect** when the time period we're thinking about is not finished. We can use **yet** if we expected or wanted the action to happen before speaking but it didn't. We an use **already** if we expected the action later but it happened early.	• **Have** you **restarted** the computer? No, I haven't. • I **haven't finished** the programming **yet**. • I'**ve already replaced** the hard drive.
We use **Past Simple** for completed actions in a finished time in the past.	• I **emailed** the manager last week. @kateryna_dereka

Task 10. Put the sentences in the correct order. Then listen and check your answers. What is the problem? What is the solution?

– Ah. Have you tried restarting your computer?
– Could you do that? And if you still have a problem, just call me again.
– Does it say anything else?
– Hi, help desk here. My name is John. How can I help you?
– Er ... no, I haven't.
– OK. Can you tell me exactly what happens?
– 10 OK. Thanks very much. I'll do that.
– Sure. When I press 'Send', I get an error message saying 'This program has found a problem and needs to close'.
– Yes, hi. I've got a problem with my email. Whenever I try to send a message, the program crashes.

– Well, something about sending an error report to the software company. Oh, and an error code: it says ‘Error 35A4’

Task 11. Look at the converstion again and underline all the examples of the present perfect and the past simple.

Task 12. Put the verbs in brackets into the correct tense: Past Simple, Present Perfect, Past Perfect, or Future Perfect. Use logical context clues.

1. Before the AI module _____ (start) analyzing the data, the technicians _____ (train) it on thousands of samples.
2. I _____ (not realize) how complex the encryption process was until we _____ (begin) to implement it.
3. By the end of this quarter, our company _____ (develop) a fully automated testing environment.
4. When I joined the project, the team already _____ (build) the prototype and _____ (run) several simulations.
5. The researchers _____ (spend) three years collecting data before they finally _____ (publish) their results.
6. So far, our clients _____ (report) only minor issues with the new operating system.
7. We _____ (not deploy) the update yet because the compatibility tests _____ (reveal) unexpected errors.
8. By 2030, experts predict that AI systems _____ (surpass) human capabilities in data analysis.
9. The IT department _____ (restore) the database immediately after they _____ (discover) the corruption.
10. I _____ (never see) such an efficient code optimization method before that seminar.

Task 13. Scan Qr-code and do the tasks.

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GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
Data	Raw facts and figures that can be processed to produce information.
Information	Processed and organized data that has meaning and value for users.

Data Processing	The transformation of raw data into useful information through a series of operations.
Data Processing System	A set of resources (people, equipment, software) used to process data.
Input	The act of entering data into the system.
Storage	Saving data for future use or additional processing.
Processing	Performing operations on data to produce meaningful information.
Output	The result of data processing in the form of information.
Control	The process that ensures all operations are carried out correctly and in the right order.
Operator	A person who operates and monitors data processing systems.

Unit 12. Data processing and Data processing systems. Comparatives/Superlatives

Questions for discussion:

1. What are the main differences between human and computer data processing?
2. Can computers make mistakes?
3. In what cases are humans still more reliable than computers?
4. How does data processing speed influence modern business, transport, or medicine?
5. «If computers can process data faster, more accurately, and in larger volumes, what is still the role of humans in these systems?»

VOCABULARY Practise the following words and word combinations.

Computer-oriented data processing system	комп'ютерно-орієнтована система обробки даних
Manual system	ручна система
Accuracy	точність
Ease of communication	легкість комунікації
Capacity of storage	обсяг зберігання
Speed of processing	швидкість обробки
Error-prone task	завдання, схильне до помилок

Invalid data	некоректні дані
Corporate database	корпоративна база даних
Microcomputer workstation	мікрокомп'ютерна робоча станція
Travel reservation system	система бронювання подорожей
Satellite-based communication	супутниковий зв'язок
Cost-effective	економічно ефективний
Post-industrial society	постіндустріальне суспільство
Information-dependent society	суспільство, залежне від інформації
Retrieve data	отримувати (відновлювати) дані
Data transmission network	мережа передавання даних

Task 1. Read and translate the text.

ADVANTAGES OF COMPUTER DATA PROCESSING

Computer-oriented data processing systems or just computer data processing systems are not designed to imitate manual systems. They should combine the capabilities of both humans and computers. Computer data processing systems can be designed to take advantage of four capabilities of computers.

1. *Accuracy.* Once data have been entered correctly into the computer component of a data processing system, the need for further manipulation by humans is eliminated, and the possibility of error is reduced. Computers, when properly programmed, are also unlikely to make computational errors. Of course, computer systems remain vulnerable to the entry by humans of invalid data.
2. *Ease of communications.* Data, once entered, can be transmitted wherever needed by communications networks. These may be either earth or satellite-based systems. A travel reservations system is an example of a data communications network. Reservation clerks throughout the world may make an enquiry about transportation or lodgings and receive an almost instant response. Another example is an office communications system that provides executives with access to a reservoir of date, called a corporate data base, from their personal microcomputer work stations.
3. *Capacity of storage.* Computers are able to store vast amounts of information, to organize it, and to retrieve it in ways that are far beyond the capabilities of humans. The amount of data that can be stored on devices such as magnetic discs is constantly increasing. All the while, the cost per character of data stored is decreasing.
4. *Speed.* The speed, at which computer data processing systems can respond, adds to their value. For example, the travel reservations system mentioned above would not be useful if clients had to wait more than a few seconds for a response. The response required might be a fraction of a second.

Thus, an important objective in the design of computer data processing systems is to allow computers to do what they do best and to free humans from routine, error-prone

tasks. The most cost-effective computer data processing system is the one that does the job effectively and at the least cost. By using computers in a cost-effective manner, we will be better able to respond to the challenges and opportunities of our post-industrial, information-dependent society.

Task 2. Answer the questions.

1. What capabilities should data-processing systems combine when designed?
2. What are the main advantages of computers?
3. What do you know of computers accuracy?
4. What is the function of communication networks?
5. Give examples of a data communication network.
6. What do you understand by capacity storage?
7. What other values of computer data processing systems do you know?
8. What is the most effective computer data processing system?

Task 3. Translate the word-combinations.

- Система обробки інформації комп'ютером
- система орієнтування на обробку даних комп'ютером
- поєднувати можливості людини і машини
- обмежувати управління
- навряд чи допустять помилку
- залишатися вразливим
- неприпустимі дані
- легкість здійснення зв'язку
- мережа передачі інформації
- системи, засновані на використанні супутників
- службовці з резервування житла
- отримати миттєву відповідь
- наводити довідки
- сховище даних
- корпоративна база даних

- обсяг пам'яті _____
- запам'ятовувати величезну кількість інформації _____
- витягувати інформацію _____
- додати значимості _____
- згаданий вище _____
- частка секунди _____
- схильний до помилок _____
- економічно виправданий _____

Task 4. Choose the correct answers to the questions.

1. **What role do communications networks play in computer data processing systems?**
   A. They allow data to be transmitted wherever needed
   B. They limit the storage capacity of computers
   C. They slow down the data transmission process
   D. They increase the possibility of errors
2. **What is the most cost-effective computer data processing system?**
   A. One that introduces errors intentionally
   B. One that slows down the processing speed
   C. One that increases human involvement
   D. One that does the job effectively and at the least cost
3. **Which of the following is NOT a capability of computers utilized in data processing systems?**
   A. Speed
   B. Limited storage capacity
   C. Ease of communications
   D. Accuracy
4. **Which system allows executives to access a reservoir of data from their personal microcomputer workstations?**
   A. Travel reservations system
   B. Data communications network
   C. Office communications system
   D. Corporate data base system
5. **How do computer data processing systems achieve accuracy?**
   A. By increasing the possibility of errors
   B. By slowing down the processing speed
   C. By eliminating the need for human manipulation
   D. By introducing human errors intentionally
6. **What is a key advantage of the storage capacity of computers in data processing systems?**
   A. High cost per character of data stored
   B. Vast amounts of information storage

C. Inability to organize data
D. Limited storage capacity

7. **What is one of the four capabilities of computers that can be utilized in data processing systems?**
   A. Intuition
   B. Flexibility
   C. Accuracy
   D. Creativity
8. **How can computer data processing systems help respond to challenges in an information-dependent society?**
   A. By increasing human involvement
   B. By introducing errors intentionally
   C. By slowing down the processing speed
   D. By using computers in a cost-effective manner
9. **Why is speed an important factor in computer data processing systems?**
   A. To add value to the systems
   B. To increase human involvement
   C. To make responses faster
   D. To slow down the processing time
10. **What is the main objective in designing computer data processing systems?**
   A. To allow computers to do what they do best
   B. To slow down the processing speed
   C. To introduce errors intentionally
   D. To increase human involvement

Task 5. Transform the sentences, using modal verbs in a) Past Simple; b) Future Simple.

1. Computers *can* replace people in dull routine work.
2. The program is a set of instructions that *may* also include data to be processed.
3. Computer-controled robots *must* increase the productivity of industry.
4. *They can* help in making different decisions.
5. The students *may* work with computers at the lessons.
6. Electric pulses *can* move at the speed of light.
7. Storage devices *must* have capacities for the input, output data and programs and for intermediate results.
8. Business minicomputers *can* perform to 100 million operations per second.
9. In order to solve scientific problems researchers *must* deal with the language of science — mathematics.
10. Programmers *must* write application programs in a way that computers *can* understand.

Task 6. Choose the correct answer.

1.Computer data _____ system frees humans from routine error-prone tasks.
a) counting; b) computing: c) processing

2.Computers can store vast amount of information to organize it and _____ it.

a) to travel; b) to retrieve; c) to respond

3.The entered data can be transmitted by _____ networks.

a) communications; b) conversions; c) procession

4.The possibility of _____ is reduced if data were correctly put into the data processing system.

a) character; b) access; c) error

5.Computer data processing systems can _____ at a frac tion of a second.

a) receive; b) respond; c) retrieve

6. Computer systems are vulnerable to the entry of_____data.

a) invalid; b) invariable; c) invisible

7. As soon as data were entered into the system correctly, the human _____ is limited.

a) computation; b) information; c)manipulation

8.The amount of data stored on magnetic discs is constantly _____.

a) decreasing; b) increasing; c) eliminating

Task 7. Scan Qr-code and do the Quiz in https://quizizz.com/ program.

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Task 8. Match the terms with their definitions.

1.Inputting	a) saving information for further processing.
2.Character	b) the process of producing useful information.
3.Database	c) meaningful collections of related characters.
4.Data elements	d) the most common input device;
5.Controlling	e) the part of the computerthat receives and stores data for processing;
6.Outputting	f) directing the sequence of the operations performed.
7.Memory	g) a written language symbol;
8.Record	h) a collection of related data elements
9.Keyboard	i) a set of related facts;
10. Storing	j) the process of entering the collected into a data processing system

Grammar Focus

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COMPARATIVES AND SUPERLATIVES	
We use **Comparatives** to compare 2 things. We use **-er than, more...than** or **less...than** with adjectives. We use **more, less** or **fewer** with nouns.	*Servers are **more expensive than** tablets.* *Laptops are **less expensive than** servers.* *We have **fewer servers than** desktops*
We use **the same (as)** or **as+adjective+as** to show that 2 things are the same.	*The set-up fee is **the same** for both plans.* *It's **as fast as** the other server.*
We use **Superlatives** to compare more than 2 things. We use **-est , the most...** or **the least...** with adjectives. We use **the most, the least** with nouns.	*This server is **the fastest** of the three but **the least reliable**.* *Which server has **the most memory**?*

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Task 9. Look at the table and complete this product comparison about HostElite's services with the correct form of the words in brackets.

The Premier server's processor is (1) _____ (powerful) of the three. This server has (2) _____ (drives) the Standart server (for instead of two). All have (3) _____ (uptime) guaranteed and they are equally secure. The Basic plan provides (4) _____ (bandwidth) the other 2 plans, with the Premier plan offering (5) _____ (bandwidth).

All 3 plans have(6) _____ (set-up fees) but the monthly fee for the Standart plan is (7) _____ (high) the fee for the Basic plan. Overall, the Premier plan has (8) _____ (high) specifications but is (9) _____ (expensive).

GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
Data Processing	The transformation of raw data into meaningful information through organized steps.
Accuracy	The degree to which data and calculations are free from errors.
Storage Capacity	The total amount of data that a computer system can store and retrieve.
Data Communications	The exchange of data between devices via transmission media such as cables or wireless systems.

Term / Expression	Definition / Explanation
Corporate Database	A centralized storage of company information accessible to authorized employees.
Workstation	A high-performance computer designed for technical or professional work.
Cost-Effectiveness	Achieving the best possible results with the least amount of resources or cost.
Error-Prone Task	A repetitive human activity likely to produce mistakes.
Invalid Data	Information that is inaccurate, incomplete, or entered incorrectly into a system.
Post-Industrial Society	A stage of society where the economy is based more on services and information than manufacturing.
Information-Dependent Society	A society in which economic and social activities rely heavily on information technology and data systems.

Unit 13. Computer Architecture. Central Processing Unit

LEAD_IN

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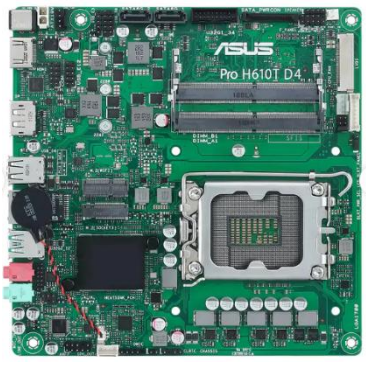


Questions for discussion:

1. What do you think is the «brain» of this device?
2. Do you think the processor can be compared to the human brain?
3. What happens when we press «Enter»? Who executes the command –the user, the program, or the processor?

VOCABULARY Practise the following words and word combinations.

Central Processing Unit (CPU)	центральний процесор
Processor speed	швидкість процесора
Control Unit (CU)	пристрій керування
Arithmetic and Logic Unit (ALU)	арифметико-логічний пристрій
Registers	регістри
Instruction decoder	дешифратор команд
Clock speed / system clock	тактова частота / системний годинник
Motherboard	материнська плата
Expansion slots	слоти розширення
Front Side Bus (FSB)	системна шина
RAM (Random Access Memory)	оперативна пам’ять
ROM (Read Only Memory)	постійна пам’ять
BIOS (Basic Input/Output System)	базова система введення/виведення
Bit / Byte	біт / байт
ASCII code	стандарт кодування ASCII
Storage capacity	обсяг пам’яті
Volatile memory	енергозалежна пам’ять
Non-volatile memory	енергонезалежна пам’ять
Integrated circuit	інтегральна схема

Task 1. Read and translate the text.

THE CPU MAIN COMPONENTS

The **processor**, also called the **CPU** or central processing unit, is the brain of your computer. In PCs, it is built into a single **chip** - a small piece of silicon with a complex electrical circuit, called an integrated circuit - that executes instructions and coordinates the activities of all the other units.

Three typical parts are:

- **the control unit (CU)**, 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 control unit:

- manages and coordinates the entire computer system
- obtains instructions from the program stored in main memory
- interprets the instructions
- issues signals that cause other units of the system to execute them
- operates by reading one instruction at a time from memory.

The control unit has the following **components**:

- *a counter* that selects the instructions, one at a time, from memory;
- *a register* that temporarily holds the instructions read from memory while it is being executed;
- *a decoder that* takes the coded instruction and breaks it down into individual commands necessary to carry it out;
- *a clock,* which produces marks at regular intervals. These timing marks are electronic and very rapid.

The speed of a processor is measured in **gigahertz** (GHz). Thus, a CPU running at 4 Hz 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.

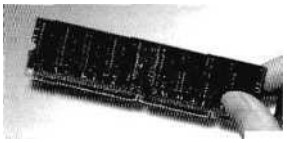
The main circuit board is known as **the motherboard**. This contains the CPU, the memory chips, expansion slots and controllers for peripherals, connected by internal **buses**, or paths, that carry' electronic signals. For example, **the front side bus** carries all data that passes from the CPU to 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.

B.RAM and ROM

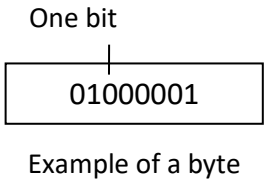
When you run a program, the CPLT looks for it on the hard disk and transfers a copy into the **RAM. RAM (random access memory)** is temporary or volatile, that is, it holds data while your PC is working on it, but loses this data when the power is switched off.



However, **ROM (read only memory)** is permanent and contains instructions needed by the CPU; the **BIOS** (basic input/output system) uses ROM to control communication with peripherals, e.g. disk drives.

The amount of RAM determines the number of programs you can run simultaneously and how fast they operate. It can be **expanded** by adding extra RAM chips.

C. Units of memory



Example of a byte

The electronic circuits in computers detect the difference between two states:
ON (the current passes through) or **OFF** (the current doesn't): they represent these states as 1 or O. Each 1 or 0 is called a **binary digit** or **bit.**

Bits are grouped into eight-digit codes that **binary digit** typically represent characters (letters, numbers and symbols). Eight bits together are called a **byte.** For example, 01000001 is used for the character A. Computers use a standard code called ASCII for the binary representation of characters.

In order to avoid complex calculations of bytes, we use bigger units. A **kilobyte** (KB) is 1,024 bytes; a **megabyte** (MB) is 1,024 kilobytes; a **gigabyte** (GB) is 1,024 megabytes; a **terabyte** (TB) is 1,024 gigabytes. We use these units to describe the RAM memory, the operating capacity of disks and the size of a program or document.

Task 2. Give the English equivalents for the following:

Функціональні блоки _____

арифметико-
логічний пристрій_____

управляти роботою усієї системи _____

отримувати команди _____

основна пам'ять_____

посилати сигнали _____

прочитувати команди поетапно _____

тимчасово зберігати інформацію _____

робити позначки через рівні проміжки часу_____

послідовність операцій _____

регістр пам'яті _____

регістр команд _____

адресний регістр _____

Task 3. Choose the correct answer.

1**. What is the main function of the Control Unit (CU) in a CPU?**

a. To perform arithmetic and logical operations
b. To manage and coordinate the entire computer system
c. To store and control data
d. To measure the speed of the processor

2. **Which component of the Control Unit selects instructions one at a time from memory?**

a. Decoder
b. Register

c. Counter
d. Clock

3. **How is the speed of a processor typically measured?**
   a. Megabytes (MB)
   b. Kilobytes (KB)
   c. Gigahertz (GHz)
   d. Terabytes (TB)
4. **What role do registers play in a CPU?**
   a. They perform arithmetic operations
   b. They store and control data
   c. They issue signals to other units
   d. They carry electronic signals to peripherals
5. **What does RAM stand for and what is its main characteristic?**
   a. Random Access Memory; it is permanent
   b. Read Access Memory; it is temporary
   c. Random Access Memory; it is volatile
   d. Read Access Memory; it is volatile
6. **Which type of memory is permanent and contains instructions needed by the CPU?**
   a. RAM
   b. ROM
   c. Cache
   d. Register
7. **What is the function of a decoder in the Control Unit?**
   a. To select instructions from memory
   b. To hold instructions temporarily
   c. To break down coded instructions into individual commands
   d. To synchronize the flow of data
8. **What is the standard code used for the binary representation of characters?**
   a. ASCII
   b. Unicode
   c. UTF-8
   d. ISO
9. **What is the size of a kilobyte (KB) in bytes?**
   a. 1,000 bytes
   b. 1,073,741,824 bytes
   c. 1,048,576 bytes
   d. 1,024 bytes
10. **What is the main circuit board in a computer known as?**
    a. Expansion slot
    b. Peripheral
    c. Motherboard
    d. CPU

Task 4. Look at A and B. Then match the sentence beginnings (1-6) with the correct endings.

1. The CPU processes data and	**a** areas within the CPU.
2. The control unit is the part of the CPU that	**b** you can't make changes to it
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** the computer is turned off
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.

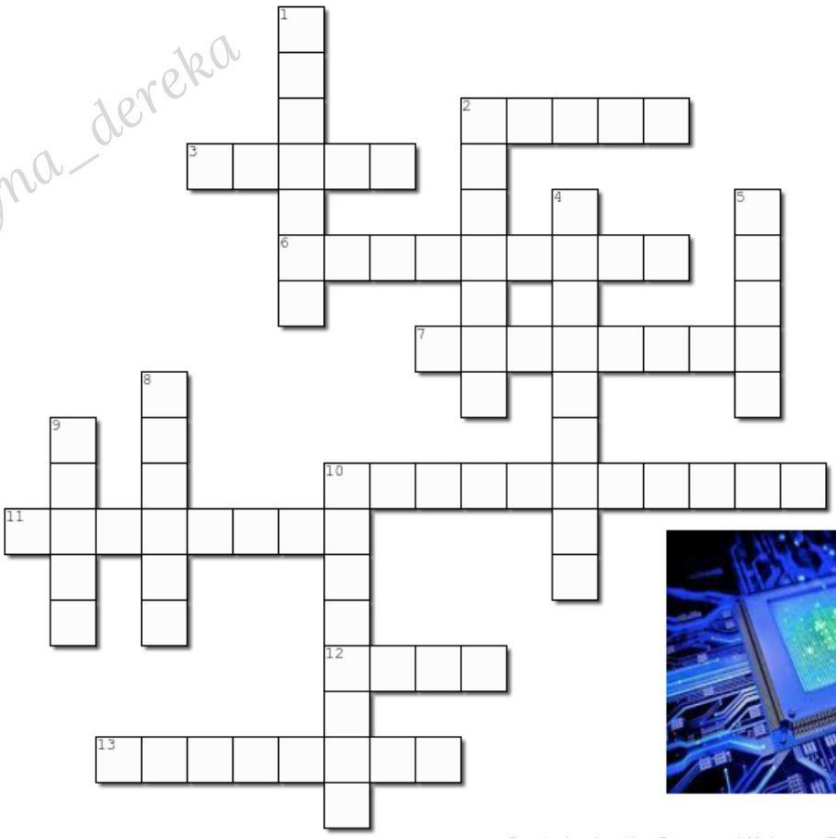
1	2	3	4	5	6

Task 5. Complete the crosswords puzzle.

Name:_____

Processing

Complete the crossword puzzle below



Created using the Crossword Maker on TheTeachersCorner.net

Across

2. A_____controls the timing within the PC by sending signals to synchronize its circuits and operations
3. Special cards can be inserted into expansion
6. ____cards improve the computer's performance.
7. 1,024 gigabytes
10. The main printed circuit board is called the
11. 1,024 megabytes
12. The _____uses ROM to control the input/output of data.
13. Holds the instructions temporarily read from memory while it is being executed

Down

1. Takes the coded instruction and breaks it down into individual commands necessary to carry it out
2. Selects the instructions, one at a time, from memory
4. The processor speed is measured in___
5. ___carry signals between different parts of a PC.
8. Each 0 or 1 is called a bit, short for_____digit
9. Intel _____are used in many computers.
10. 1,024 kilobytes

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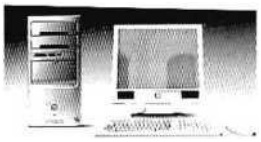
Task 6. Complete the following sentences with the most appropriate word from the list provided.

Processor, Control Unit, Arithmetic and Logic Unit (ALU), Registers, Random Access Memory (RAM), Read Only Memory (ROM), Integrated Circuit, Motherboard, Expansion Cards, Binary, Digit

1. The CPU, also known as _____, is the brain of the computer.
2. _____ is a system of numbers that uses only two symbols, 0 and
3. The _____ is responsible for performing mathematical calculations such as addition and subtraction.
4. _____ are used to temporarily store data and instructions within the CPU.
5. The _____ is the main circuit board of a computer, containing the CPU and other components.
6. _____ allows for the addition of new features and capabilities to a computer system.
7. _____ is a type of memory that stores essential programs and data that cannot be changed or erased easily.
8. A _____ is a tiny piece of semiconductor material that contains many electronic components.

Task 7. Read this product description and answer the questions below.

1. How fast is the CPU?
2. Which term is used to describe the CPU data bus?
3. How much RAM does the computer have?
4. Can you add extra RAM chips? How many?



Processor and memory:
- Intel Core 2 Duo processor at 2.4 GHz .
- 533 MHz Front Side Bus .
- 1,024 MB of RAM; can be expanded up to 4 GB

200 GB Hard disk
Double Layer DVD +/-R/RW drive
Microsoft Windows

Task 8. Scan QR-code and do the Quiz.

Task 9. Match the terms with their definitions:

1. CPU
2. Control Unit (CU)

3. ALU
4. Register
5. Motherboard
6. RAM
7. ROM
8. Bit
9. Byte
10. Expansion slot

Definitions:

a) A high-speed unit of memory used to store data temporarily.
b) The "brain" of the computer that executes instructions.
c) Eight binary digits grouped together.
d) Permanent memory that contains basic instructions for communication.
e) A unit of memory that stores a 1 or 0.
f) The main circuit board containing CPU, memory chips, and controllers.
g) Performs arithmetic and logical operations.
h) Part of the CPU that manages and coordinates system activities.
i) Volatile memory that stores data while the PC is running.
j) Connector on the motherboard used to install additional cards.

Task 10. Fill in the gaps with correct words (CPU, RAM, ROM, motherboard, bit, byte).

1. A _____ is a small piece of silicon with a complex integrated circuit.
2. A _____ is the smallest unit of information a computer can process.
3. A _____ usually represents a single character.
4. When the PC is switched off, all data in _____ is lost.
5. The BIOS is stored in _____.
6. The _____ connects the CPU, memory, and other hardware components.

Task 11. **Rewrite the sentences in the Passive Voice.**

1. The control unit obtains instructions from memory.
2. The CPU executes billions of instructions every second.
3. The BIOS controls communication with peripherals.
4. Expansion slots allow users to install additional cards.
5. Computers use ASCII to represent characters.

_____
_____
_____
_____
_____
_____

Task 12. Choose the correct form (Participle I or II).

1. The _____ (store) data in RAM disappears when power is off.
2. The CPU sends signals to the _____ (connect) devices.
3. A _____ (decode) instruction is broken down into commands.
4. The CPU has a clock _____ (produce) signals at regular intervals.
5. ASCII is a code system _____ (use) to represent characters.

Task 13. Open the link at https://www.blooket.com and play the game to the topic "Processing".

Task 14. Complete the sentences with the correct form of the infinitive (simple, continuous, perfect, passive, or perfect passive). Some sentences require "to" and some do not.

1. The system seems _____ (operate) under heavy load since last night.
2. Our project is believed _____ (complete) before the new regulations come into effect.
3. The network administrator appears _____ (monitor) the data flow when the crash occurred.
4. She would rather _____ (not reveal) the source code to third parties.
5. The new framework is said _____ (increase) performance by at least 30%.
6. The manager expects the developers _____ (finish) the beta version by next week.
7. The software turned out _____ (contain) several critical vulnerabilities.
8. He seems _____ (work) on this algorithm for months without success.
9. The document is too confidential _____ (share) outside the department.
10. They claim _____ (have tested) the prototype under real-world conditions.

Task 15. Scan Qr-code and do the tasks. https://app.wizer.me/learn/15FMSN

GLOSSARY TO THE TOPIC

Term / Expression	Definition / Explanation
CPU (Central Processing Unit)	The main component of a computer responsible for executing instructions and processing data.

Term / Expression	Definition / Explanation
Control Unit (CU)	The part of the CPU that manages and coordinates the activities of the entire system.
Arithmetic and Logic Unit (ALU)	The CPU component that performs mathematical and logical operations.
Registers	Small, high-speed memory locations within the CPU used for temporary data storage.
Instruction Decoder	A circuit that translates instructions into signals the CPU can execute.
Clock Speed	The rate at which a CPU executes instructions, measured in gigahertz (GHz).
Motherboard	The main circuit board that connects all computer components.
Expansion Slot	A connector that allows the addition of new cards (e.g., graphics or network cards).
RAM (Random Access Memory)	Temporary memory used by the CPU to store data and instructions while programs are running.
ROM (Read Only Memory)	Permanent memory that contains essential startup instructions for the computer.
BIOS	Firmware stored in ROM that manages basic input and output operations during startup.
Bit	The smallest unit of data in computing, representing a binary value of 0 or 1.
Byte	A group of eight bits, typically representing one character.
ASCII	A standardized code for representing text characters in binary form.
Integrated Circuit	A microchip that contains a complex set of electronic circuits.
Bus	A communication system that transfers data between components inside a computer.
Volatile Memory	Memory that loses its contents when power is turned off.
Non-Volatile Memory	Memory that retains data even when the power is off.
Storage Capacity	The total amount of data a computer or device can hold.

Unit 14. Client and Server Interaction. Gerund

Questions for discussion:

1. What *actually happens* when you type **www.google.com** in your browser and press *Enter*?
2. How many "invisible steps" do you think are needed before the page appears?
3. Who does the real work — the *browser*, the *server*, or the *network*?
4. How is a URL like an "address" in the real world?
5. What would happen if TCP did not resend lost packets?
6. Why is HTTPS safer than HTTP?

VOCABULARY **Practise the following words and word combinations.**

Client-server system	система клієнт–сервер
Web client / browser	вебклієнт / веббраузер
Server farm / data center	серверна ферма / дата-центр
Request / Response	запит / відповідь
Uniform Resource Identifier (URI)	уніфікований ідентифікатор ресурсу
Uniform Resource Locator (URL)	уніфікований локатор ресурсу
Uniform Resource Name (URN)	уніфіковане ім'я ресурсу
Protocol / Scheme	протокол / схема
Hostname	ім'я хоста
Path and file name	шлях і назва файлу
Fragment	фрагмент
Application layer	прикладний рівень
Transport layer	транспортний рівень
Internetwork layer	міжмережевий рівень
Network access layer	рівень доступу до мережі
Hypertext Transfer Protocol (HTTP)	протокол передавання гіпертексту
Transmission Control Protocol (TCP)	протокол керування передачею
Internet Protocol (IP)	інтернет-протокол
Ethernet	технологія Езернет
Packet / Segment	пакет / сегмент
Acknowledgment (ACK)	підтвердження отримання
Retransmission	повторна передача
Reliability	надійність передавання
Routing	маршрутизація
Data flow	потік даних
End host	кінцевий вузол мережі

Task 1. Read the text. Find out new phrases and definitions.

Client and Server Interaction

- We use network services available over networks and the internet to communicate with others and to perform routine tasks.
- A **server** is a host running a **software application** (or server service) that provides services to other hosts (clients)
- There are millions of servers on the internet. Clients and servers interact following agreed upon standards and protocols.

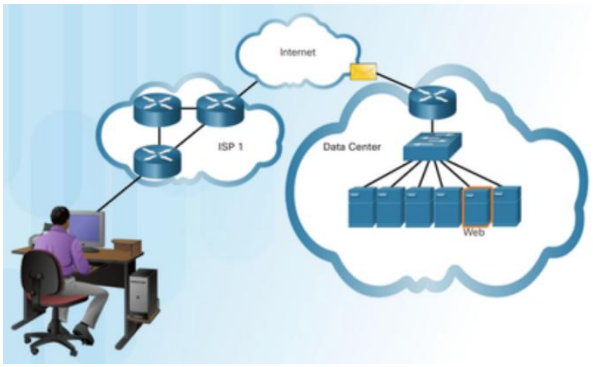
Type	Description
Email	The email server runs email server software. Clients use mail client software, such as Microsoft Outlook, to access email on the server.
Web	The web server runs web server software. Clients use browser software, such as Windows Internet Explorer, to access web pages on the server.
File	The file server stores corporate and user files in a central location. The client devices access these files with client software such as the Windows File Explorer.

Client Requests a Web Page

A client/server system is illustrated by the interaction between a web client and a web server:

1. A person uses a web browser to access a web server by sending a request, for example, requesting a web page.
2. The server receives the request and responds by sending the requested web page back to the client.

A **web server** is usually in a part of the network with other servers called a server farm, or within a data center.

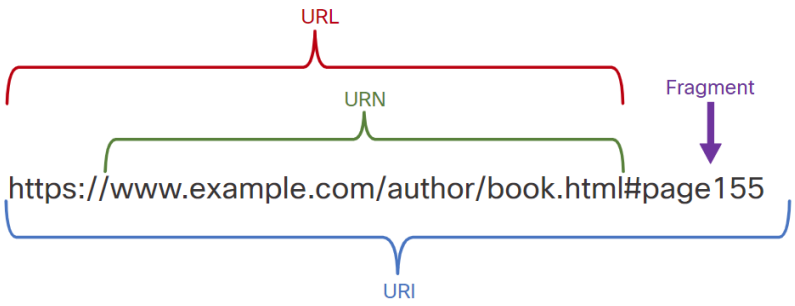


URI, URN, and URL

Uniform Resource Name (URN) - identifies only the namespace of the resource without reference to the protocol.
Uniform Resource Locator (URL) - defines the network location of a specific resource on the network.

Components in the example URL:

- **Protocol/scheme** - HTTPS or other protocols such as FTP, SFTP, mailto, and NNTP
- **Hostname** - www.example.com
- **Path and file name** - /author/book.html
- **Fragment - #page155**



Protocol Operations

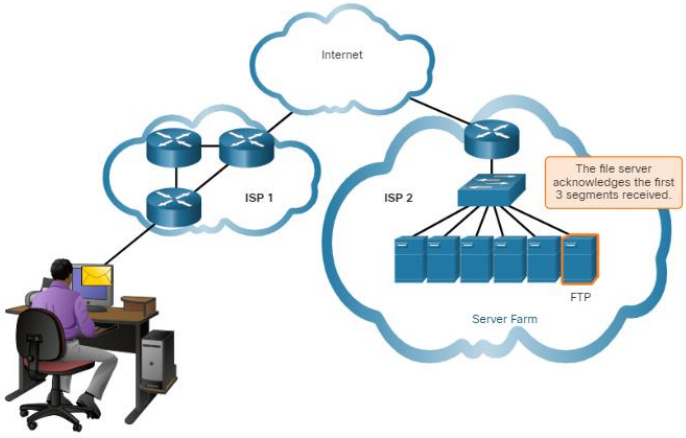
A web server and a web client use specific protocols and standards in the process of exchanging information to ensure that the messages are received and understood. The various **protocols** necessary to deliver a web page function at the four different layers of the TCP/IP model are as follows:

- **Application Layer Protocol** - Hypertext Transfer Protocol (HTTP) governs the way that a web server and a web client interact.
- **Transport Layer Protocol** - Transmission Control Protocol (TCP) ensures that IP packets are sent reliably, and any missing packets are resent.
- **Internetwork Layer Protocol** - The most common internetwork protocol is Internet Protocol (IP) which is used to identify end hosts and to route packets to destination host.
- **Network Access Layer** - The specific protocol at the network access layer, such as Ethernet, depends on the type of media and transmission methods used in the physical network.

TCP Reliability

Tansmission Control Protocol (TCP) helps ensure reliable delivery of data packets:

- **TCP** breaks up a message into small pieces (segments).
- Segments are numbered in sequence and passed to the IP process for assembly into packets.
- **TCP** tracks the number of segments that have been sent.
- If the sender does not receive an acknowledgment within a certain period, it assumes that the segments were lost and retransmits only the missing portion of the message.



On the receiving host, **TCP** is responsible for reassembling the message segments in orders and passing them to the application.

Task 2. Fill in the gaps.

Hypertext Transfer Protocol, data, software application, algorithms, Uniform Resource Name, server, web server, port, Uniform Resource Locator, protocol/scheme, Transmission Control Protocol

1. The company uses advanced _____(1) for data processing to analyze customer behavior.
2. The_____ (2) crashed due to a large influx of online traffic.
3. The new _____(3) has revolutionized the way we manage our finances.
4. The website is hosted on a _____(4) located in a secure data center.
5. Each resource on the internet is identified by a _____ (5)
6. I found the information I needed by following a _____(6) provided in the email.
7. The website is secured using the HTTPS _____(7) to protect user _____(8).
8. The _____ (9) ensures that data packets are delivered in the correct order.
9. The _____(10) is used for transmitting and formatting multimedia content.
10. Make sure to open the appropriate _____(11) on your firewall for incoming connections.

Task 3. Choose the correct answer.

1. Which of the following is a characteristic of how clients and servers interact?
A. Clients and servers communicate using a single protocol.
B. There are only a few servers on the internet.
C. Clients and servers interact following agreed upon standards and protocols.
D. Network services are not available over networks and the internet.

2. What is the difference between a Uniform Resource Name (URN) and a Uniform Resource Locator (URL)?
A. A URN defines the network location of a specific resource, while a URL identifies only the namespace of the resource.
B. A URN identifies only the namespace of the resource, while a URL defines the network location of a specific resource.
C. URN and URL are the same thing.
D. URN and URL are not used in communication over the internet.

3. Which protocol governs the way that a web server and a web client interact?
A. Transmission Control Protocol (TCP)
B. Internet Protocol (IP)
C. Ethernet
D. Hypertext Transfer Protocol (HTTP)

4. Which of the following is not a function of the Transmission Control Protocol (TCP) in ensuring reliable delivery of data packets?

A. TCP breaks up a message into small pieces (segments).
B. TCP tracks the number of segments that have been sent.
C. TCP does not retransmit missing segments.
D. TCP ensures that IP packets are sent reliably.

5. What is the role of a server in a client-server architecture?

A. A server is a host running a software application that provides services to itself.
B. A server is a host running a software application that provides services to other hosts (clients).
C. A server is a host running a software application that provides services to the network.
D. A server is a host running a software application that provides services to the internet.

6. At which layer of the TCP/IP model does the Hypertext Transfer Protocol (HTTP) operate?

A. Application layer
B. Transport layer
C. Internetwork layer
D. Network access layer

7. How does the Transmission Control Protocol (TCP) ensure reliable delivery of data packets?

A. TCP ensures reliable delivery by identifying end hosts and routing packets to the destination host.
B. TCP ensures reliable delivery by using specific protocols and standards at the application, transport, internetwork, and network access layers.
C. TCP ensures reliable delivery by breaking up a message into small pieces (segments) and passing them to the IP process for assembly into packets.
D. TCP ensures reliable delivery by tracking the number of segments that have been sent and retransmitting any missing segments.

8. What is the primary purpose of a server in a network, as highlighted in the passage?

A. To communicate with other servers
B. To browse the internet
C. To perform routine tasks
D. To provide services to other hosts (clients)

9. Which protocol is responsible for ensuring the reliable delivery of data packets, as described in the text?

A. HTTP
B. Ethernet
C. IP
D. TCP

10. The text above states that the Uniform Resource Locator (URL) defines the ____ of a specific resource on the network.

A. namespace
B. protocol
C. network location

D. identification

11. What is the primary function of the Hypertext Transfer Protocol (HTTP), as outlined in the passage?

A. To identify end hosts and route packets
B. To govern the way a web server and client interact
C. To ensure reliable delivery of data packets
D. To manage the physical network layer

12. The passage explains that TCP breaks up a message into small pieces called _____, which are then passed to the IP process for assembly into packets.

A. frames
B. segments
C. packets
D. datagrams

13. Which protocol is described in the text as the most common internetwork protocol, used to identify end hosts and route packets?

A. TCP
B. HTTP
C. Ethernet
D. IP

Task 4. Rephrase stese sentences, using phrases in box.

web server, transmission control protocol, data processing, software application, hypertext transfer protocol, server, protocol/scheme, uniform resource locator, port, uniform resource name

1. The company hired a team of experts for processing information.
2. The system crashed due to high traffic on the website.
3. The program needs to be updated for better performance.
4. The server is experiencing technical difficulties.
5. A URN uniquely identifies a resource on the internet.
6. The URL of the website is easy to remember.
7. The protocol used for secure communication is HTTPS.
8. TCP ensures reliable transmission of data over the network.
9. HTTP is the foundation of data communication on the World Wide Web.
10. The port number for email communication is 25.

Task 5. Scan Qr-code and do the Quiz in https://quizizz.com/ program.

Task 6. Read the text carefully. Write out new terms and find their definitions in the dictionary. Write them too. Then make a word-cloud in https://wordart.com/ with these definitions.

Operating System

An Operating System(OS) is software that manages and handles the hardware and software resources of a computer system. It provides interaction between users of computers and computer hardware. An operating system is responsible for managing and controlling all the activities and sharing of computer resources. An operating system is a low-level Software that includes all the basic functions like processor management, memory management, Error detection, etc.

This Operating System tutorial will cover all the basic to advance operating system concepts like System Structure, CPU Scheduling, Deadlock, file and disk management, and many more.

An Operating System performs all the basic tasks like managing files, processes, and memory. Thus operating system acts as the manager of all the resources, i.e. resource manager. Thus, the operating system becomes an interface between the user and the machine. It is one of the most required software that is present in the device.

Operating System is a type of software that works as an interface between the system program and the hardware. There are several types of Operating Systems in which many of which are mentioned below. Let's have a look at them.

There are several types of Operating Systems

- Batch Operating System
- Multi-Programming System
- Multi-Processing System
- Multi-Tasking Operating System
- Time-Sharing Operating System
- Distributed Operating System
- Network Operating System
- Real-Time Operating System

Task 7. Fill in the blank with the correct words.

Activities	**files**	**Multi-Tasking**	**Operating System**	**Software**

1. An _____ is software that manages and handles the hardware and software resources of a computer system.

2. An operating system is responsible for managing and controlling all the _____and sharing of computer resources.
3. An operating system is a low-level _____that includes all the basic functions like processor management, memory management, and Error detection.
4. An operating system performs all the basic tasks like managing _____, processes, and memory.
5. _____ Operating System is a type of operating system that allows multiple programs to run concurrently.

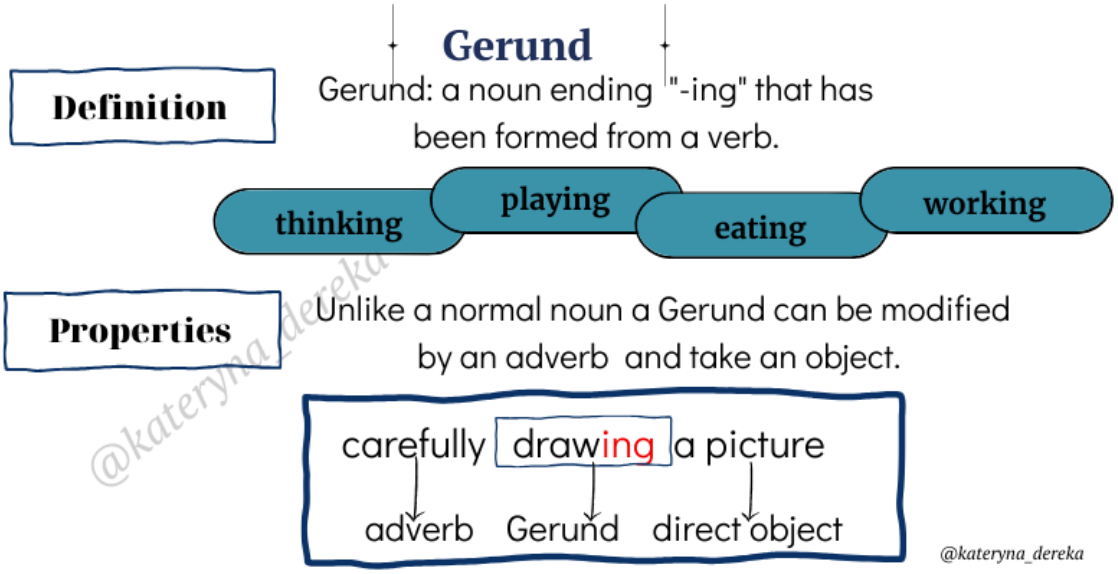
Task 8. Choose the correct answer from the choices for each question.

1. Which of the following is NOT a type of operating system?
   a) Batch Operating System
   b) Real-Time Operating System
   c) Object-Oriented Operating System
   d) Distributed Operating System
2. **Which of the following is responsible for managing the allocation and de-allocation of memory?**
   a) Process Manager
   b) Memory Manager
   c) File Manager
   d) Device Manager
3. **Which of the following operating systems is commonly used in embedded systems and mobile devices?**
   a) Windows
   b) macOS
   c) Linux
   d) iOS
4. **Which of the following operating systems is designed to provide a high degree of responsiveness and reliability for time-critical applications?**
   a) Batch Operating System
   b) Time-Sharing Operating System
   c) Real-Time Operating System
   d) Distributed Operating System
5. **Which of the following operating systems allows multiple users to access the system simultaneously?**
   a) Single-user Operating System
   b) Multi-user Operating System
   c) Network Operating System
   d) Distributed Operating System

Task 9. Answer the following questions in complete sentences.

1. Explain the role of an operating system as an interface between the user and the computer hardware.

2. Describe the main responsibilities of an operating system in managing computer resources.
3. Discuss the differences between batch, multi-programming, and multi-tasking operating systems.



Умова	Герундій	Інфінтив
У реченні вжито такі слова: **agree, appear, arrange, care, claim, demand, deserve, fial, get, happen, hesitate, hope, intend**		+
Використовується частка **to** для вираження мети		+
Вживається після прикметників		+
У реченні є такі питальні слова як **who, which, what, how, where**		+
Вжита конструкція **make / hear/ feel / see / let** +додаток		+
Вживається після прийменників (наприклад **of/ for/ about**	+	
У реченні стоять такі сталі вирази: **it is no use…., in addition to…., there's no point in…**	+	
Після дієслів **hear/ watch/ listen/ see**	+	
Після **go, admit, avoid, enjoy, consider, fancy, discuss, dislike, finish**	+	
У реченні вжито такі слова: **begin, continue, hate, love, like, start** (значення при цьому не змінюється)	+	+
Слова, після яких вживається інфінітив і герундій: **remember, forget, stop, try** (але при цьому значення змінюється)	+	+

+ TO-INFINITIVE

These verbs are followed by a **to-infinitive.**

- to agree – погоджуватися
- to aim – мати наміром, намагатися, цілитися
- to appear – виявлятися, виявитися
- to arrange – домовлятися, урегулювати
- to ask – просити
- to attempt – намагатися
- to be able – бути в змозі, могти
- to beg – просити, благати
- to begin – починати
- to care – хотіти, мати бажання
- can't wait – не можу дочекатися
- to choose – вибирати
- to claim – заявляти, стверджувати
- to decide – вирішити, прийняти рішення
- to demand – вимагати, просити
- to deserve – заслуговувати
- to expect – очікувати
- to fail – зазнавати невдачі, провалюватися, не зробити
- провалюватися, не зробити
- to happen – виявитися, статися
- to hesitate – вагатися, не наважуватися
- to hope – сподіватися
- to intend – мати намір, збиратися
- to manage – впоратися, зуміти
- to offer - пропонувати
- to plan – планувати
- to prepare – приготуватися
- to promise – обіцяти

+ ING-FORM

These verbs are followed by an **ing-form.**

- admit – визнавати, допускати
- advise – радити
- allow – вирішувати, дозволяти
- avoid – уникати, ухилятися
- be worth – коштувати чого-небудь, заслуговувати
- can not help – не можу не, не можна ні (утриматися)
- celebrate – святкувати;
- consider – розглядати, обмірковувати
- delay – затримувати, відкладати
- discuss – обговорювати
- dislike – не любити
- enjoy – насолоджуватися
- excuse -вибачатися
- explain – пояснювати
- fancy – уявити, бажати, хотіти
- finish – закінчувати
- forgive – прощати
- give up – здаватися, відмовлятися
- give up – здаватися, відмовлятися
- keep, keen on – продовжувати
- mind – заперечувати (тільки в питаннях і запереченнях)
- permit – вирішувати, дозволяти
- postpone – відкласти, перенести
- practice – практикувати, займатися
- put off – відкласти
- recommend – рекомендувати, радити

+ TO-INFINITIVE	+ ING-FORM
These verbs are followed by a **to-infinitive.** • to refuse – відмовлятися • to seem – здаватися, мати вигляд • to tend – мати тенденцію, схилятись, прагнути • to wait – чекати • to want – хотіти • to wish – хотіти, бажати	These verbs are followed by an **ing-form.** • report – повідомляти, доповідати • risk – ризикувати • suggest – пропонувати • support – підтримувати, сприяти • understand – розуміти

Task 10. Scan Qr-code and watch the presentation about Gerund.

Task 11. Choose the correct form of the verbs.

1. I am planning _____ (to visit/visiting) Venice next week.
2. When they finish _____ (to eat/eating) their lunch, they'll go to the office.
3. He suggested _____ (to buy/buying) some new equipment.
4. Does Sally enjoy _____ (to go/going) to the gym?
5. Don't put off _____ (to write/writing) a report till the end of the month.
6. John refused _____ (to answer/answering) my question.
7. My brother intends _____ (to get/getting) married soon.
8. Keep _____ (to beat/beating) the eggs.
9. We expect _____ (to leave/leaving) tomorrow.
10. Mary decided _____ (to fly/flying) to Madrid.
11. The sportsmen hope _____ (to get/getting) the best results.
12. Are you going to give up _____ (to smoke/smoking)?
13. They don't want _____ (to have/having) any more children.
14. I don't mind _____ (to wash up/washing up).

Task 12. Complete the conversations. Put in a to-infinitive or an ing-form.

► A: I hear you sometimes sail to France in your boat.
B: That's right. I really enjoy *sailing*.

1. A: Are you going to organize our trip?
   B: Yes, of course. I've agreed_____it.
2. A: You wear a uniform at work, don't you?

B: Yes, I have to, although I dislike _____ it.

3. A: Do you think they'll approve the plan?
   B: Yes, I'm quite sure they'll decide _____ it.
4. A: What time will you be back?
   B: Oh, I expect_____ back some time around nine.
5. A: Did I remind you about the dinner tonight?
   B: Yes, thank you. You keep_____me.
6. A: Was your decision the right one, do you think?
   B: Yes, luckily. In the end it proved_____ the best thing for everyone.
7. A: Do you still work at the post office?
   B: No, I gave up_____ there last year.
8. A: Have ICM bought the company?
   B: Well, they've offered_____it.
9. A: I'm sorry you had to wait all that time.
   B: Oh, it's all right. I didn't mind_____.

Term / Expression	Definition / Explanation
Client-server model	A network architecture where the client requests services resources from a server.
Web browser	Software that allows users to access and view websites or the Internet.
Web server	A computer or software that stores, processes, and delive web pages to clients.
URL (Uniform Resource Locator)	The address of a resource on the Internet, indicating the protocol, host, and path.
URN (Uniform Resource Name)	Identifies a resource by name without indicating its locati or protocol.
URI (Uniform Resource Identifier)	A string that identifies a resource on the Inter encompassing both URLs and URNs.
Protocol	A set of rules that determine how data is transmitted received over a network.

Term / Expression	Definition / Explanation
HTTP (Hypertext Transfe Protocol)	The application layer protocol that defines communicat between web clients and servers.
TCP (Transmission Contr Protocol)	Ensures reliable delivery of data by controlling segmentati transmission, and acknowledgment.
IP (Internet Protocol)	Defines the addressing and routing of packets acı interconnected networks.
Ethernet	A technology for local area networks (LANs) that cont how data is transmitted over cables.
Packet	A formatted unit of data carried by a packet-switc network.
Segment	A small portion of data divided by TCP for effic transmission.
Acknowledgment (ACK)	A message sent by a receiver to confirm the successful rec of data.
Retransmission	The resending of data segments that were lost or dama during transmission.
Server farm	A group of networked servers housed together to prov large-scale computing services.
Data center	A facility used to house computer systems and associa components such as storage and networking equipment.
Routing	The process of selecting paths in a network along whicl send data packets.
Network layer	The layer responsible for moving data between devices different networks.
Transport layer	The layer responsible for reliable data delivery and error control between end systems.

Unit 15. Storage. Герундій

Imagine your brain as a computer. 🧠 Some memories stay right "on the surface," ready for instant use — others are stored deep inside, waiting until you really need them. Computers work the same way — they have **primary** (quick-access) and **secondary** (long-term) memory.

Discussion questions:

1. What do you think happens inside a computer when you press "Save"?
2. Why do we need both fast and slow types of storage?
3. Can you guess why computers use only two digits — 0 and 1 — to store everything?
4. Do you think computer "memory" is similar to human memory? In what way?

VOCABULARY Practise the following words and word combinations.

Computer system architecture	архітектура комп'ютерної системи
storage unit	пристрій зберігання даних
primary storage	первинна (основна) пам'ять
secondary storage	вторинна пам'ять
central processing unit (CPU)	центральний процесор
input/output units	пристрої введення/виведення
main storage / internal storage	головна / внутрішня пам'ять
data processing	обробка даних
intermediate results	проміжні результати
final results	кінцеві результати
memory	пам'ять
binary number system	двійкова система числення
bit (binary digit)	біт (двоїчний розряд)
byte	байт

word (in memory)	слово (у пам’яті)
binary code	двійковий код
coded character	закодований символ
semiconductor	напівпровідник
storage location	осередок пам’яті
data capacity	ємність даних

Task 1. Read and translate the text.

STORAGE UNITS

Computer system architecture is organized around the **primary storage unit** because all data and instructions used by the computer system must pass through primary storage. Our discussion of computer system units will begin with the functions of the **primary and secondary storage units**. This leads to the examination of the **central processing unit** and from there to the consideration of the input and output units. Therefore, the sequence in which we'll describe the functional units of a digital computer is:

1) storage units, primary and secondary; _____

2) central processing unit; _____

3) input and output units. _____

As you know, there are primary and secondary storage units. Both contain data and the instructions for processing the data. Data as well as instructions must flow into and out of primary storage.

Primary storage is also called **main storage** or **internal storage**. The specific functions of internal storage are to hold (store):

1) all data to be processed;

2) intermediate results of processing;

3) final results of processing;

4) all the instructions required for ongoing process.

Another name for primary storage is **memory**, because of its similarity to a function of the human brain. Computer memory must be able to retain very large numbers of symbol combinations, without forgetting or changing any details. It must be able to locate all its contents quickly upon demand. The combinations of characters, that is, the letters, numbers, and special symbols by which we usually communicate, are coded. The codes used by computer designers are based upon a number system that has only two possible values, 0 and 1. A number system with only two digits, 0 and 1, is called ***a binary number system***. Each binary digit is called a **bit**, from Binary digit. As the information capacity of a single bit is limited to 2 alternatives, codes used by computer designers are based upon combinations of bits. These combinations are called ***binary codes***. The most common binary codes are 8-bit codes because an 8-bit code

provides for 2/8, or 256 unique combinations of 1's and 0's, and this is more than adequate to represent all of the characters by which we communicate.

Data in the form of coded characters are stored in adjacent storage locations in main memory in two principal ways:

1) as "strings" of characters — in bytes; and

2) within fixed-size "boxes" — in words.

A fixed number of consecutive bits that represent a character is called *a **byte**.* The most common byte size is 8-bit byte. *Words* are usually 1 or more bytes in length.

Secondary storage. Primary storage is expensive because each bit is represented by a high-speed device, such as a **semiconductor**. A million bytes (that is, 8 million bits) is a large amount of primary storage. Often it is necessary to store many millions, sometimes billions, of bytes of data. Therefore slower, less expensive storage units are available for computer systems. These units are called *secondary storage.* Data are stored in them in the same binary codes as in main storage and are made available to main storage as needed.

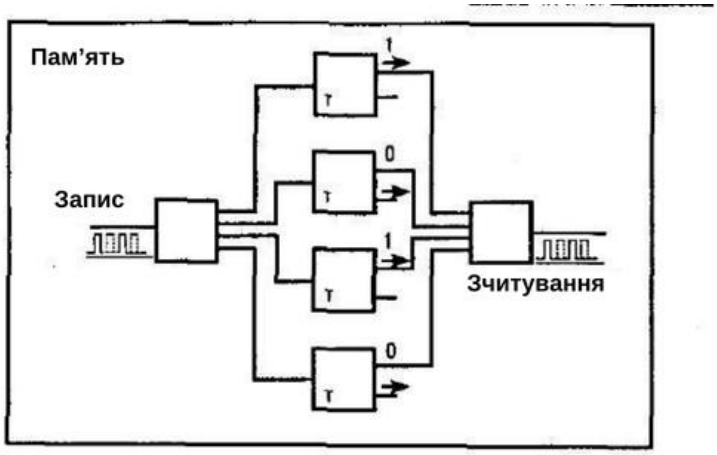


Fig.4. Storage

Task 2. Choose the correct answer.

1. **What is the primary purpose of the central processing unit (CPU) in a computer system?**

A. To execute instructions and perform calculations

B. To provide high-speed storage for frequently accessed data

C. To convert binary data into human-readable information

D. To serve as a backup for the primary storage unit

2. **Which type of storage unit is used to store large amounts of data that cannot fit in the primary storage?**

A. Cache memory

B. Secondary storage

C. Volatile memory

D. Non-volatile memory

3**. What is the primary advantage of using a binary number system in computer systems?**

A. It is more efficient than the decimal number system

B. It allows for a large number of unique character combinations

C. It is easier for humans to understand and work with

D. It requires less storage space than the decimal number system

4. **What is the purpose of the input and output units in a computer system?**

A. To execute instructions and perform calculations

B. To convert data between binary and human-readable formats

C. To provide storage for data and instructions

D. To manage the flow of information between the computer and external devices

5. **Which of the following is a characteristic of the primary storage unit in a computer system?**

A. It is used for long-term storage of data

B. It is slower and less expensive than secondary storage

C. It can hold all data and instructions required for processing

D. It is controlled independently from the central processing unit

6. **How do computer designers represent different characters using the binary number system?**

A. By using 8-bit codes that provide 256 unique combinations

B. By using a single bit to represent each character

C. By using a combination of letters, numbers, and special symbols

D. By using a fixed-size "box" called a word to store each character

7. **What is the primary difference between primary and secondary storage in terms of cost and speed?**

A. B. Primary storage is used for long-term storage, while secondary storage is used for temporary storage

B. Primary storage is volatile, while secondary storage is non-volatile

C. Primary storage is controlled by the central processing unit, while secondary storage is independent

D. Primary storage is more expensive but faster, while secondary storage is slower but less expensive

Task 3. Find in the text the words similar in the meaning with the following words.

Memory; element; information; command; examination; character; quantity; number; place; computer architect; likeness.

To apply; to form; to move; to hold; to demand; to connect; to supply; to place; to name; to start; to examine.

Continuous; significant; consecutive; usual; enough; main; initial; general.

Task 4. Translate the phrases using the text.

1. Функціональний блок	
2. Пристрій вводу	
3. Пристрій управління	
4. Арифметико-логічний пристрій	
5. Структура комп'ютерної системи	
6. Первинний запам'ятовуючий пристрій (ЗП)	
7. Внутрішня пам'ять	
8. Проміжні результати	
9. Система обчислення	
10.Двійкова система числення	
11.Можливі величини	
12.Суміжні комірки пам'яті	

Task 5. Match the terms and their definitions.

1. primary storage unit
2. central processing unit
3. binary codes
4. semiconductor
5. binary number system
6. secondary storage units

a. devices like hard drives or flash drives used to store data long-term on a computer.

b. a material that can conduct electricity under certain conditions, commonly used in electronic components like transistors.

c. a system of numbers using only 0s and 1s, which computers use to represent data and perform calculations.

d. sets of 0s and 1s used to represent characters or instructions in computing systems.

e. the main place in a computer where data is temporarily stored for processing.

f. the part of a computer that carries out instructions and performs calculations.

Task 6. Scan QR-code and do the tasks (Infinitive/Gerund).

Task 7. Complete the sentences with the correct form of the verb in brackets: -ing or to + infinitive.

1. Developers avoid _____ (use) outdated libraries in new projects.
2. The manager promised _____ (review) the new security policy next week.
3. We decided _____ (upgrade) our servers to increase performance.
4. Most users prefer _____ (work) with cloud storage instead of local drives.
5. He denied _____ (leak) any confidential information.
6. The system requires _____ (restart) after installing updates.
7. I can't imagine _____ (work) without version control tools anymore.
8. Our instructor encouraged us _____ (participate) in the coding challenge.
9. She admitted _____ (forget) to back up her files before formatting the disk.
10. The technician managed _____ (restore) the lost data successfully.

Task 8. Scan Qr-code and do the tasks (Infinitive/Gerund).

GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
Computer system architecture	The overall design and structure of a computer system, showing how the CPU, memory, and input/output devices work together.
Primary storage (main memory)	Fast, internal storage directly accessible by the CPU; holds data and instructions currently in use.
Secondary storage	Slower, external storage (like hard drives or SSDs) used for long-term data saving.
Central Processing Unit (CPU)	The "brain" of the computer that performs instructions, calculations, and controls all other units.

Term / Expression	Definition / Explanation
Input/Output units	Devices that allow communication between the user and the computer (e.g., keyboard, monitor, printer).
Memory	The part of the computer that stores data and instructions, either temporarily or permanently.
Binary number system	A numbering system with only two digits, 0 and 1, used by computers to represent data.
Bit	The smallest unit of information in computing, representing either a 0 or a 1.
Byte	A group of 8 bits that represents one character (letter, number, or symbol).
Word	A fixed group of bytes processed as a single unit by the computer.
Binary code	A set of instructions or data represented in binary digits (0s and 1s).
Storage location	A specific place in memory where data is kept.
Semiconductor	A material used to make high-speed memory devices and processors.
Data capacity	The total amount of data that a storage device can hold

Unit 16. Computer Programming

Imagine you're an architect – but instead of designing buildings, you design *thinking machines*. Every instruction you write is like a brick in a skyscraper of logic. If one brick is misplaced, the whole structure collapses. That's what programming is all about – *creating perfect logic*. Before writing any line of code, programmers build a "blueprint" — a **flowchart** or **pseudocode** – to make sure the computer will follow the right path and never get lost in a loop of confusion.

Discuss the questions:

1. What is a computer program?
2. Why do computers need programs to function?

3. Have you ever written a program or seen a piece of code? What language was it written in?
4. Why is planning (e.g. flowcharts or pseudocode) important before writing a real program?
5. What could happen if a program has logical errors?

VOCABULARY **Practise the following words and word combinations.**

Equation	рівняння
list of instructions	список інструкцій / команда до виконання
to guard	захищати, запобігати, оберігати
appropriate sequence	відповідна послідовність
program logic	логіка програми
flowchart (n)	блок-схема (іменник)
flowcharting (n)	складання блок-схем / процес побудови блок-схем
pictorial representation	графічне (візуальне) зображення / схема
predefined symbols	попередньо визначені символи / стандартні умовні позначення
specifics (n)	деталі, конкретні особливості
template (n)	шаблон, трафарет
pseudocode(n)	псевдокод (спрощена форма запису алгоритму)
burden (n)	тягар, навантаження
programming rules	правила програмування
to consume	споживати, витрачати (наприклад, час або ресурси)
to emphasize	наголошувати, підкреслювати
top-down approach	підхід “згори вниз” (метод проєктування від загального до деталей)
looping logic	логіка повторення / циклічна логіка (у програмуванні)

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Task 1. Scan Qr-code and practise new words and phrases in https://quizlet.com.

Task 2. Read and translate the text.

COMPUTER PROGRAMMING

Programming is the process of preparing a set of coded instructions which enables the computer to solve specific problems or to perform specific functions. The **essence of computer programming** is the encoding of the program for the computer by means of algorithms. The thing is that any problem is expressed in mathematical terms, it contains formulae, equations and calculations. But the computer cannot manipulate formulae, equations and calculations. Any problem must be specially processed for the computer to understand it, that is — coded or programmed.

The phase in which the system's computer programs are written is called the **development phase**. The **programs** are lists of instructions that will be followed by the control unit of the central processing unit (CPU). The instructions of the program must be complete and in the appropriate sequence, or else the wrong answers will result. To guard against these errors in logic and to document the program's logical approach, logic plans should be developed.

There are two common techniques for planning the logic of a program. The first technique is **flowcharting**. A **flowchart** is a plan in the form of a graphic or pictorial representation that uses predefined symbols to illustrate the program logic. It is, therefore, a "picture" of the logical steps to be performed by the computer. Each of the predefined symbol shapes stands for a general operation. The **symbol shape** communicates the nature of the general operation, and the specifics are written within the symbol. A plastic or metal guide called a **template** is used to make drawing the symbols easier.

The second technique for planning program logic is called **pseudocode**. Pseudocode is an imitation of actual program instructions. It allows a program-like structure without the burden of programming rules to follow. Pseudocode is less time-consuming for the professional programmer than is flowcharting. It also emphasizes a top-down approach to program structure.

Pseudocode has **three basic structures**: sequence, decision, and looping logic. With these three structures, any required logic can be expressed.

VOCABULARY EXERCISES

Task 3. Give the English equivalents for the following:

Сукупність закодованих команд _____

суть комп'ютерного програмування _____

кодування за допомогою алгоритму _____

формули, рівняння, обчислення _____

обробити особливим чином _____

перелік команд _____

необхідна послідовність_____

захищати від помилок _____

складати план логічної послідовності _____
загальноприйнята методика _____
логічна послідовність виконання програми _____
побудова блок-схеми _____
наочне представлення _____
заздалегідь задані символи _____
шаблон _____
псевдо програма _____
без витрат _____
виділяти принцип низхідної обробки _____
витрачати менше часу _____
логічна схема виконання операцій в циклі _____
необхідна послідовність операцій _____

Task 4. Choose the correct answer.

1**. Which phase involves the writing of computer programs?**
A. Planning phase
B. Development phase
C. Testing phase
D. Deployment phase

2. **Which of the following is NOT a common technique for planning the logic of a computer program?**
A. Flowcharting
B. Pseudocode
C. Decision tables
D. Sequence diagrams

3. **What is the primary purpose of using predefined symbols in a flowchart?**
A. To make the flowchart more visually appealing
B. To communicate the nature of the general operations in the program
C. To standardize the format of the flowchart
D. To simplify the process of creating the flowchart

4. **Which of the following is NOT one of the three basic structures in pseudocode?**
A. Conditional statements
B. Looping structures
C. Function calls
D. Sequence of instructions

5. **What is the main advantage of using pseudocode over flowcharting for program planning?**
A. Pseudocode is more detailed and comprehensive
B. Pseudocode is easier to understand for non-technical stakeholders
C. Pseudocode emphasizes a top-down approach to program structure
D. Pseudocode is less time-consuming for the programmer

6. **What is the primary role of the central processing unit (CPU) in executing a computer program?**

A. The CPU writes the program instructions
B. The CPU stores the program instructions
C. The CPU interprets and follows the program instructions
D. The CPU creates the program logic

7. **Which of the following is NOT a key element in the development phase of computer programming?**

A. Writing the computer programs
B. Designing the user interface
C. Creating a system architecture
D. Performing mathematical calculations

8. **What is the main purpose of developing logic plans for a computer program?**

A. To ensure the program is aesthetically pleasing
B. To facilitate the compilation of the program
C. To communicate the program's functionality to the user
D. To guard against errors in logic and document the program's approach

9.**What is the main purpose of pseudocode in programming?**

A. To create a visual representation of logic steps
B. To imitate actual program instructions without following programming rules
C. To write the final program code
D. To test the program for errors

10. **Which of the following is NOT a basic structure of pseudocode?**

A. Sequence
B. Decision
C. Looping
D. Compilation

Task 5. Match the terms with correct definitions.

1. programming	
2. calculations	
3. template	
4. pseudocode	
5. programs	
6. development phase	
7. flowcharting	
8. equations	
9. manipulate	

a. the process of solving math problems or determining numerical results through arithmetic operations.

b. to handle or control data or objects in a way that changes their appearance or behavior.
c. the stage in a project where ideas are turned into tangible products through planning, designing, and building.
d. software applications or sets of instructions that tell a computer what to do.
e. mathematical statements that show the relationship between two expressions by using symbols like +, -, *, or /.
f. a pre-designed format or layout that can be used as a starting point for creating something new.
g. creating visual diagrams that show the steps and logic of a program or process.
h. the process of writing instructions for a computer to follow in order to perform tasks.
i. a way of writing out algorithms using simple, human-readable language before translating them into actual code.

Task 6. Match the English word-combinations with the Ukrainian ones.

Program: access program; application program; archived program; binary program; common program; compatible / incompatible program; control / management program; database program; debugging program; educational / teaching / training program; free program; general-purpose program; high-performance program; off-line program; on-line program; operating (-system) program; processing program; protected-mode program; remote program; running program; self-loading program; simulation program; support program; utility program; virus-detection program; watch-dog program.

Програма в двійковому коді; _____
застосовна програма; _____
(не)сумісна програма; _____
безкоштовна програма; _____
програма відладки; _____
сторожова програма; _____
дистанційна програма; _____
програма моделювання; _____
сервісна програма; _____
допоміжна програма; _____
програма для доступу (до даних); _____
програма, що заархівувала; _____
програма, працююча з базою даних; _____
навчальна програма; _____
програма, що виконується з великою швидкістю; _____

універсальна програма; _____

програма, що виконується в захищеному режимі; _____

програма обробки даних; _____

програма операційної системи (системна програма); _____

виконувана програма; _____

мережева /не мережева програма; _____

програма, що самозавантажується; _____

часто використовувана (поширена) програма; _____

програма управління; _____

програма виявлення. _____

Task 7. Open the link given by the teacher in https://quizizz.com and play the game.

Task 8. Use the correct form of the verb in brackets and pay attention to meaning changes.

1. I stopped _____ (check) my email because it distracted me from coding.
2. I stopped _____ (check) my email before leaving the office.
3. Remember _____ (save) your document before closing the program.
4. I remember _____ (test) this application on the old system.
5. Try _____ (update) the driver; it might fix the problem.
6. I tried _____ (update) the driver, but it didn't help.
7. He forgot _____ (log out) of the admin account.
8. I'll never forget _____ (present) my first project at the IT conference.
9. The students went on _____ (discuss) the advantages of AI tools.
10. The students went on _____ (discuss) new grammar topics after the break.

Task 9. Open the link https://www.blooket.com and play the game to the topic «Processing».

GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
Programming	The process of writing a set of coded instructions that a computer can understand and execute to perform specific tasks.
Coded instructions	Commands written in a programming language that tell the computer what to do.
Algorithm	A clear, step-by-step procedure for solving a problem or performing a task.
Encoding	The process of converting information or instructions into a code or format the computer can understand.
Formula / Equation	Mathematical expressions used to describe relationships between variables; often part of algorithm design.
Development phase	The stage in system creation where the actual computer programs are written and tested.
Central Processing Unit (CPU)	The main part of a computer that performs instructions and controls other components.
Control Unit	A component of the CPU that directs the operation of the processor by interpreting program instructions.
Logic plan	A detailed outline of the logical steps a program must follow to achieve its goal.
Flowchart	A graphical diagram that represents the sequence of operations in a program using standard symbols.
Symbol	A predefined shape (e.g., diamond, rectangle, oval) used in flowcharts to represent types of actions or decisions.
Template	A guide or stencil used to draw standard flowchart symbols neatly and consistently.
Pseudocode	A simplified, language-like representation of program logic that uses plain English instead of programming syntax.
Top-down approach	A method of problem-solving in which a system is broken into smaller, more manageable parts.
Sequence	A programming structure where instructions are executed one after another in order.
Decision (selection)	A programming structure where one of two or more actions is taken depending on a condition (e.g., IF–THEN–ELSE).

Term / Expression	Definition / Explanation
Looping (iteration)	A programming structure that repeats a set of instructions until a certain condition is met.
Logical error	A mistake in the program's logic that causes incorrect results even though the program runs without crashing.
Debugging	The process of finding and correcting errors in a computer program.

Unit 17. Programming. Gerund

Imagine you could "talk" to your computer and tell it exactly what to do – solve a math problem, draw a 3D object, or even launch a spaceship. But your computer doesn't speak English or Ukrainian – it understands only **1s and 0s**. That's why we use **programming languages** – a kind of "translator" between humans and machines. From early low-level machine code to modern high-level languages like Python and Java, programming languages are the real bridge that connects human creativity with computer logic.

VOCABULARY **Practise the following words and word combinations.**

Programming	програмування
program	програма
computer language	мова програмування
instruction	інструкція, команда
machine code	машинний код
binary system	двійкова система
assembly language	мова асемблера
assembler	асемблер (програма-перекладач)
low-level language	мова низького рівня
high-level language	мова високого рівня

compiler	компілятор
code translation	переклад коду
FORTRAN	Фортран
COBOL	Кобол
BASIC / Visual BASIC	Бейсік / Віжуал Бейсік
C language	мова Сі
Java / Java applet	Джава / аплет Джава
markup language	мова розмітки
HTML	мова розмітки гіпертексту (HTML)
VoiceXML	голосова мова розмітки XML
web browser	вебпереглядач
flowchart	блок-схема
coding	написання коду
debugging	налагодження
bug fixing	виправлення помилок
software developer	розробник програмного забезпечення
program documentation	документація програми
maintenance program	програма технічного обслуговування
updated version	оновлена версія
scientific application	наукове застосування
business application	бізнес-застосування

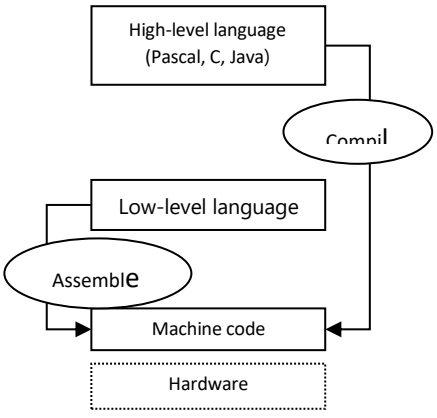
Task 1. Read the text and write the translation.

Programming languages

Programming is the process of writing a program using a computer language.

A program is a set of instructions which a computer uses to do a specific task (e.g. a solution to a Maths problem).

The only language a PC can directly execute is machine code, which consists of 1s and 0s. This language is difficult to write, so we use symbolic languages that are easier to understand. For example, assembly languages use abbreviations such as ADD, SUB, MPY to represent instructions. The program is then translated into machine code by software called an assembler.



One of the most widely used languages today is **Python**. It is popular because of its simple syntax and its strong ecosystem for data science, AI, and web development. Python is also beginner-friendly, which makes it ideal for education.

In web development, **JavaScript** remains the key language. It runs in all browsers and allows developers to build interactive websites. With frameworks such as React, Vue, and Angular, JavaScript has become essential for frontend development. For backend development, JavaScript is used through Node.js, which makes it possible to build full-stack applications using one language.

For mobile development, **Kotlin** and **Swift** are now dominant. Kotlin is an official language for Android development, offering safety features and clean syntax. Swift is used for iOS applications and is known for its speed and modern design.

In enterprise systems, **Java** and **C#** are still widely used. These languages are stable, secure, and scalable, which makes them ideal for banks, government platforms, and large corporate software.

For high-performance applications, such as game engines, operating systems, or embedded systems, developers use **C++** and increasingly Rust. Rust is becoming especially popular because it provides memory safety without sacrificing speed.

Steps in writing a program

To write a program, software developers usually follow these steps.

1. First they try to **understand the problem** and **define the purpose** of the program.
2. They **design a flowchart**, a diagram which shows the successive logical steps of the program.
3. Next they **write the instructions** in a high-level language (Pascal, C, etc.). This is called coding. The program is then compiled.
4. When the program is written, they **test it**: they run the program to see if it works and use special tools to detect bugs, or errors. Any errors are corrected until it runs smoothly. This is called debugging, or bug fixing.
5. Finally, software companies **write a detailed description** of how the program works, called **program documentation**. They also have a maintenance program. They get reports from users about any errors found in the program. After it has been improved, it is published as an updated version.

Task 2. Match the terms from A opposite with their definitions.

1	programming	a	basic language which consists of binary codes
2	machine code	b	programming language such as C, Java or Visual BASIC
3	assembly language	c	writing computer programs
4	high-level language	d	low-level language translated into machine code by an assembler

5	Java applet	e	software which converts a source program into machine code
6	compiler	f	language used to create and format documents for the Web
7	markup language	g	small self-contained program written in Java

1	2	3	4	5	6	7

Task 3. Choose the correct answer.

1. **What is the primary purpose of a computer program?**
   A. To execute machine code
   B. To solve a specific task
   C. To write instructions in a symbolic language
2. **What is the primary function of an assembler in programming?**
   A. To translate assembly language into machine code
   B. To compile high-level language into machine code
   C. To debug source code
3. **What is the only language a computer can directly execute?**
   A. Symbolic language
   B. Assembly language
   C. High-level code
   D. Machine code
4. **What do assembly languages use to represent instructions, making them easier to understand than machine code?**
   A. High-level keywords
   B. Symbolic abbreviations
   C. Numerical strings
   D. Complex algorithms
5. **What do assembly languages use to represent instructions, making them easier to understand than machine code?**
   A. High-level keywords
   B. Symbolic abbreviations
   C. Numerical strings
   D. Complex algorithms
6. **In the context of Python, what does "simple syntax" refer to?**
   A. Complex code structures.
   B. Easy-to-read programming rules.
   C. Fast program execution.
   D. Strict hardware requirements.
7. **A developer wants to build an interactive website that runs in all browsers. Which programming language should they choose?**
   A. Python
   B. JavaScript
   C. C++

D. Swift

8**. If you are developing an application specifically for an iPhone, which language is primarily used?**

A. Java
B. Swift
C. Python
D. Kotlin

9. **What distinct advantage do languages like C++ and Rust offer over Java and C# for applications like game engines?**

A. Faster execution and memory control
B. Higher security features
C. Simpler syntax for beginners
D. Better user interfaces

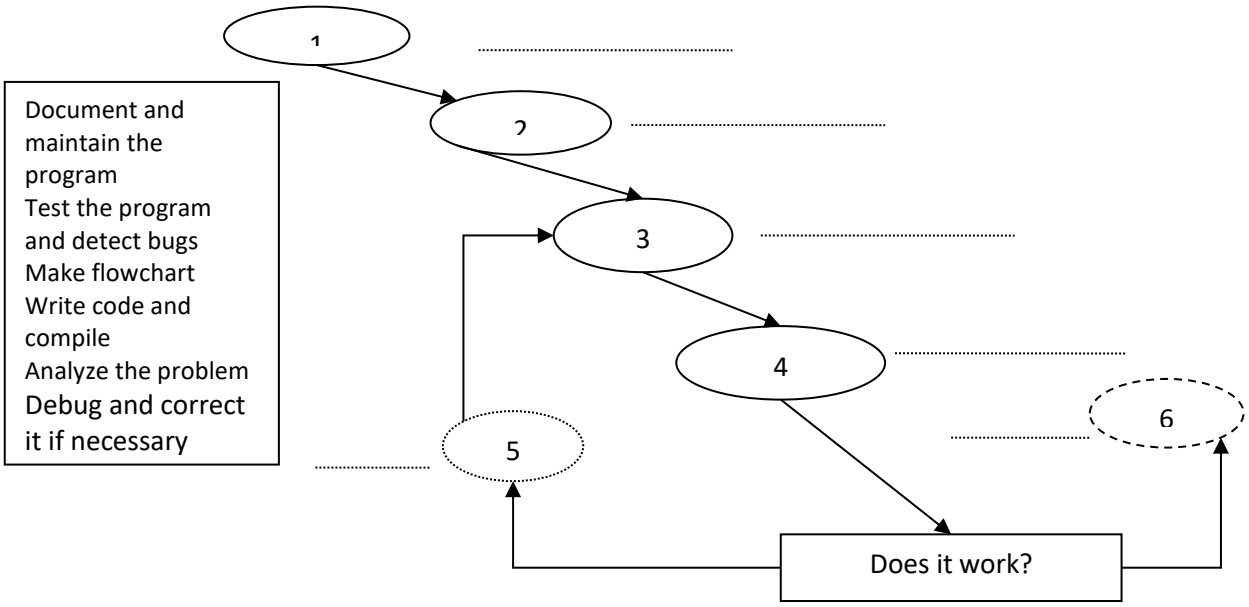
10. **After writing the code for a program, what is the next logical step a developer should take according to the text?**

A. Test the program for errors.
B. Write detailed program documentation.
C. Define the purpose of the program.
D. Design a flowchart for the program.

11.A software company has released a new program. What is a crucial step after its release to ensure ongoing improvement?

A. Stop all further development on it.
B. Ignore user feedback completely.
C. Collect user reports for errors.
D. Create a brand new program.

Task 4. Look at B and then put these programming steps into the correct order.



Task 5. Match the items (A–H) with the correct definition (1–8):

A. Python
B. Rust
C. JavaScript

D. Kotlin
E. Framework
F. Compile
G. Backend
H. Swift

1. Used for iOS development
2. Translates code into machine language
3. Known for memory safety
4. Used for Android development
5. A set of tools used to build apps faster
6. Runs in browsers
7. Server-side logic of an application
8. Popular for AI and data science

Task 6. Complete the sentences.
Use the words: ***frontend, backend, syntax, compile, ecosystem, framework, memory safety, high-performance, cross-platform, runtime.***

1. Developers must learn the _____ rules of each programming language.
2. Unity is a popular _____ for game development.
3. Rust is known for its strong _____ features.
4. The _____ environment determines how the program behaves after launch.
5. React is widely used in _____ development.
6. Java is often used for _____ applications that require speed.
7. Flutter is a _____ solution for mobile development.
8. Node.js is used for _____ development.
9. Before running the program, we need to _____ it.
10. Python has a rich _____ with many libraries.

Task 7. Choose the correct word

1. Swift is mainly used for (Android / iOS / backend) apps.
2. JavaScript is essential for (frontend / cloud / hardware) development.
3. C++ is often used for (games / marketing / education).
4. Kotlin is an official language for (iOS / Windows / Android).
5. Python is popular in (data science / art / management).
6. Rust helps avoid (syntax errors / memory errors / design errors).
7. Java is widely used in (banking / fashion / medicine).
8. A framework makes development (slower / easier / impossible).

Task 8. Transform the sentences into the Passive voice.

1. Developers write programs in high-level languages.
2. A compiler translates the code into machine language.
3. Users report errors to the company.
4. The system stores data temporarily in RAM.

5. Developers test the program to find bugs.
6. The company publishes an updated version every year.
7. Engineers design flowcharts before coding.
8. Rust provides memory safety.
9. Python helps beginners learn programming quickly.
10. The company maintains the software.

Task 9. Open the link at https://www.blooket.com and play the game.

Task 10. Scan Qr-code and do the tasks.

GLOSSARY TO THE TOPIC

@kateryna_dereka

Term / Expression	Definition / Explanation
Programming	The process of writing a set of instructions that a computer can execute to perform a specific task.
Program	A collection of coded instructions that tells a computer how to perform a particular operation.
Machine Code	The most basic language of computers, consisting only of binary digits (1s and 0s).
Assembly Language	A low-level language that uses short words or abbreviations (like ADD or SUB) instead of binary numbers.
Assembler	A program that converts assembly language into machine code.
Low-level Language	A programming language that is close to hardware and difficult for humans to read.
High-level Language	A language that is closer to human language, easy to understand, and independent of hardware.
Compiler	A program that translates an entire high-level program into machine code before it runs.
FORTRAN	One of the earliest programming languages, used mainly for scientific and mathematical computations.
COBOL	A high-level language developed for business, finance, and administrative systems.
BASIC / Visual BASIC	Originally a teaching language; Visual BASIC is now used for developing Windows applications.

Term / Expression	Definition / Explanation
C Language	A powerful programming language used to develop system software, graphics, and commercial applications.
Java	A cross-platform language designed for the web; Java applets run on web pages to add interactivity.
Markup Language	A system for formatting and structuring documents on the web (e.g., HTML, XML).
HTML (HyperText Markup Language)	The standard coding language used to create and design web pages.
VoiceXML	A markup language that enables users to interact with web content through voice commands and telephones.
Flowchart	A diagram that shows the logical steps or flow of a program's operations.
Coding	The process of writing program instructions in a specific programming language.
Debugging / Bug Fixing	Detecting and correcting errors or defects in program code.
Program Documentation	Detailed written description of how a program works, including its structure and functions.
Maintenance Program	A process of regularly updating and improving software after its release.
Updated Version	A newer release of a program that includes improvements, new features, or bug fixes

Unit 18. Programming Software

Have you ever wondered how programmers actually "talk" to computers? They don't just type random words – they use **programming software**, a powerful set of tools that helps create, test, and improve computer programs. From writing lines of code in a programming language to debugging complex systems, programming software provides everything developers need to build applications, websites, and even games. Let's explore the main tools programmers use and how they work together to make software development faster and smarter.

VOCABULARY Practise the following words and word combinations.

Programming software	програмне забезпечення для програмування
developer	розробник
to write / test / maintain programs	писати / тестувати / підтримувати програми
programming language	мова програмування
rule	правило
instruction	інструкція, команда
Python / Java / C++	Пайтон / Джава / Сі-плюс-плюс
code	код
text editor	текстовий редактор
source code editor	редактор вихідного коду
syntax highlighting	підсвічування синтаксису
auto-completion	автодоповнення
IDE (Integrated Development Environment)	інтегроване середовище розробки
compiler	компілятор
interpreter	інтерпретатор
linker	компоновник (лінкер)
executable program	виконувана програма
debugger	налагоджувач
debugging	налагодження (пошук і виправлення помилок)
error / bug	помилка / збій у коді
efficiency	ефективність
accuracy	точність
machine code	машинний код
to translate code	перекладати код
line by line	рядок за рядком
interface	інтерфейс
to identify and fix errors	виявляти й виправляти помилки

Task 1. Read the text and find out new terms and their definitions.

Understanding Programming Software

Programming software helps developers write, test, and maintain programs. It includes specialized tools that make the process of writing software more efficient and effective.

One of the most important components of programming software is the **programming language**. A programming language is a set of rules that allows humans to communicate instructions to a computer. Popular programming languages include Python, Java, and C++.

To write code, developers use a text editor or a source code editor. A **text editor** is a basic tool that lets you write plain text, while a source code editor provides extra features like syntax highlighting and auto-completion to support coding.

Most developers prefer to work in **an IDE** (Integrated Development Environment). An IDE combines several tools into one interface. It usually includes a source code editor, a compiler, a debugger, and sometimes a linker or interpreter.

A **compiler** translates the entire program into machine code before running it. In contrast, an **interpreter** translates code line by line and runs it immediately. A **linker** combines different pieces of code into one executable program.

Debugging is also a key step. A **debugger** helps identify and fix errors in the code. Without it, developers might spend hours finding bugs manually.

All these tools are part of what we call programming software, and they make coding faster, easier, and more accurate.

🔍 Key Terms and Definitions

1. **Programming software** – tools used to create, test, and maintain computer programs.
2. **Program** – a set of instructions written to perform a specific task.
3. **Programming language** – a formal language used to write programs.
4. **Text editor** – a simple tool for writing plain text.
5. **Source code editor** – a specialized text editor for writing code, with helpful features.
6. **IDE** (Integrated Development Environment) – software that combines coding tools in one interface.
7. **Compiler** – a tool that translates the whole program into machine code.
8. **Interpreter** – a tool that translates and runs code line by line.
9. **Linker** – software that combines pieces of code into a single program.
10. **Debugger** – a tool that helps find and fix errors in the code.

Task 2. Match the Word to the Definition.

1. Compiler
2. Debugger
3. IDE
4. Text editor
5. Linker
6. Interpreter
7. Program
8. Programming language
9. Source code editor
10. Programming software

A. Tool that helps find bugs in the code
B. Translates the entire program before execution
C. Basic tool for writing plain text
D. Set of rules for writing software
E. Environment that includes many tools for coding
F. Tool that runs code line by line
G. Tool for writing code with features like syntax highlighting
H. Combines pieces of code into one program
I. A written set of instructions for a computer
J. All the tools used for writing and testing programs

Task 3. Use the words from the box.

IDE, program, interpreter, debugger, text editor, compiler, linker, source code editor, programming software, programming language

1. A _____ helps turn all your code into machine instructions at once.
2. Python is a popular _____ that is easy for beginners.
3. A _____ checks your code for errors and bugs.
4. I prefer to write my code in a _____ because it supports auto-complete.
5. An _____ allows you to run code line by line, which is useful for testing.
6. I use a _____ to write quick notes or basic code without formatting.
7. A good _____ makes software development more efficient.
8. The _____ combines code libraries into one file.
9. An _____ often includes tools like a debugger and a compiler.
10. A _____ is created when you give a computer instructions to follow.

Task 4. Complete the sentences using the words from the box below.

IDE compiler program interpreter debugger text editor linker programming language programming software source code editor

1. Python is a popular _____ that is known for its simplicity and readability.
2. A(n) _____ allows the user to write, compile, and debug code within the same environment.
3. If the code has syntax errors, the _____ will stop and point them out.

4. A _____ translates the entire code into machine language before execution.
5. A(n) _____ runs the code line by line, making it easier to test short scripts.
6. Notepad is a basic example of a _____, often used to write plain text.
7. When creating large applications, a _____ combines different code modules into one executable file.
8. Before running, the source code written in a _____ must be compiled or interpreted.
9. Many developers use a _____ with features like syntax highlighting and auto-completion.
10. Visual Studio and Eclipse are examples of _____ that help streamline the development process.

Task 5. Choose the correct option (A, B, or C) to complete each sentence.

1. A _____ helps the programmer identify logical or runtime errors in the code.
   A. linker
   B. debugger
   C. interpreter
2. A _____ is required to turn high-level code into executable machine code.
   A. compiler
   B. text editor
   C. IDE
3. The _____ brings together all tools a developer needs into one application.
   A. interpreter
   B. programming language
   C. IDE
4. A _____ is often used for simple editing tasks like writing notes or plain text.
   A. source code editor
   B. text editor
   C. debugger
5. The _____ processes code one line at a time, which makes it slower but useful for testing.
   A. compiler
   B. interpreter
   C. linker

Task 6. Decide whether the statements are true (T) or false (F). Correct the false ones.

1. An IDE is only used for writing code.

2. A program is made up of instructions that tell the computer what to do.
3. A debugger translates source code into machine code.
4. A linker is useful when you are working with multiple code files.
5. A source code editor is less advanced than a text editor.

Task 7. Open the program https://www.socrative.com/ and scan the Qr-code for the test-game.

Task 8.Complete the sentences using First Conditional.

1. If we _____(use) a debugger, we _____ (find) the error faster.
2. If the compiler _____(fail), the program _____ (not/run).
3. You _____ (learn) more quickly if you _____(use) an IDE.
4. If the code _____(be) correct, it _____ (compile) successfully.
5. The system _____ (crash) if you _____(not fix) the bug.
6. If you _____(study) Python, you _____ (understand) programming basics.
7. If I _____(open) the source code editor, I _____ (see) the syntax.
8. You _____ (save) time if you use auto-complete features.
9. If the interpreter _____(show) an error, I _____ (correct) it.
10. We _____ (test) the program if we _____(have) enough time.

Task 9. Complete the sentences using Passive Voice.

1. This program _____ (write) in Python.
2. The bug _____ (find) by the debugger yesterday.
3. A new patch _____ (release) every week.
4. The source code _____ (edit) by two developers.
5. All errors _____ (detect) during testing.
6. This version _____ (not/test) yet.
7. Code _____ (compile) before it is run.
8. The file _____ (save) automatically in the IDE.
9. The app _____ (develop) by a small team.
10. Updates _____ (send) to users via email.

Task 10. Complete the sentences with should, shouldn't, might, must, can't:

1. You _____ install the latest version of the compiler for better results.

2. The program _____ be working; there's no output.
3. Developers _____ use an IDE to improve efficiency.
4. You _____ forget to save your code regularly.
5. This error _____ be related to the interpreter.
6. He _____ debug the code before the deadline.
7. You _____ test the program on different systems.
8. This code _____ cause issues if left unoptimized.
9. You _____ depend only on the text editor.
10. That function _____ be defined yet.

Task 11. Read the clues and guess the term. One student gives the clue; the other guesses. You may time the round (e.g. 1 minute per team).

1. I am a basic tool to write plain text. What am I?

   _____
2. I help you find and fix bugs in your program. _____
3. I translate your code line by line. _____
4. I bring several coding tools together in one program.

   _____
5. I convert all your code into machine language. _____
6. I combine different pieces of code into one file.

   _____
7. I am a set of instructions for a task. _____
8. I highlight syntax and offer code suggestions.
9. I protect and organize everything you need for coding.

   _____
10. I'm Python or Java, for example. _

Term / Expression	Definition / Explanation
Programming Software	A category of software that provides tools to help programmers develop, test, and maintain computer programs.
Programming Language	A formal set of rules and symbols used to communicate instructions to a computer (e.g. Python, Java, C++).
Code	The written instructions or commands that make up a computer program.
Text Editor	A simple tool that allows you to write and edit plain text, often used for basic coding tasks.
Source Code Editor	An enhanced text editor designed for coding, featuring syntax highlighting, line numbering, and auto-completion.

Term / Expression	Definition / Explanation
IDE (Integrated Development Environment)	A complete software suite that combines a code editor, compiler, debugger, and other tools in one interface for developers.
Compiler	A tool that converts an entire program written in a high-level language into machine code before execution.
Interpreter	A program that executes code line by line, translating it into machine code on the fly.
Linker	A program that joins different code modules or files into one executable program.
Debugger	A software tool used to detect, analyze, and fix errors (bugs) in the source code.
Debugging	The process of finding and correcting errors in a computer program.
Machine Code	The low-level binary code that the CPU can directly execute.
Syntax Highlighting	A feature in code editors that displays text in different colors to make the code easier to read and understand.
Auto-completion	A feature that predicts and completes code statements automatically to save time and reduce typing errors.
Efficiency	The ability of software or tools to perform tasks quickly and with minimal resources.
Accuracy	The degree to which code performs correctly without errors

Unit 19. Operating System. Герундій.

Every computer, whether it's a smartphone, laptop, or supercomputer, has an invisible "brain" that makes everything work smoothly – the **Operating System (OS)**. It manages files, memory, devices, and processors so users and programs can work efficiently.

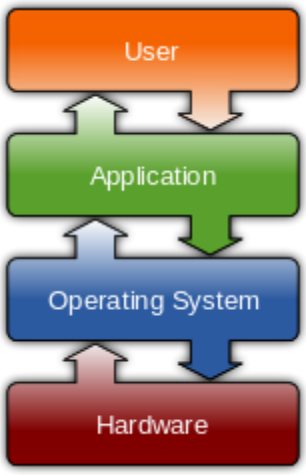
Without an operating system, a computer is just a collection of hardware parts that can't communicate or function together. Let's explore what an operating system does, its main functions, and why it's one of the most important pieces of software ever developed.

VOCABULARY Practise the following words and word combinations.

Operating system (OS)	операційна система
system software	системне програмне забезпечення
application program	прикладна програма
kernel	ядро операційної системи
resource allocation	розподіл ресурсів
memory	пам’ять
processor	процесор
CPU (Central Processing Unit)	центральний процесор
ALU (Arithmetic Logic Unit)	арифметико-логічний пристрій
I/O devices (Input/Output devices)	пристрої введення/виведення
peripheral devices	периферійні пристрої
storage devices	пристрої зберігання даних
compiler	компілятор
loader	завантажувач
editor	редактор
virtualization	віртуалізація
networking	мережеві можливості
scheduling	планування завдань
interprocess communication	міжпроцесна комунікація
performance monitoring	моніторинг продуктивності
backup and recovery	резервне копіювання та відновлення
debugging	налагодження (виправлення помилок)
primary (main) memory	основна пам’ять
memory allocation / deallocation	розподіл / звільнення пам’яті
process scheduling	планування процесів
file management	керування файлами
directory	каталог
error detection	виявлення помилок
malicious software (malware)	шкідливе програмне забезпечення

system failure	збій системи
data integrity	цілісність даних
unauthorized access	несанкціонований доступ

What is the operating system?



An **operating system (OS)** is system software that manages computer hardware and software resources and provides common services for computer programs.

The operating system is an essential component of the system software in a computer system. Application programs usually require an operating system to function.

Two most important functions of the operating system:

- The Operating System as an Extended Machine
- The Operating System as a Resource Manager

A more common definition is that the **operating system** is the one program running at all times on the computer (usually called the kernel), with all else being application programs.

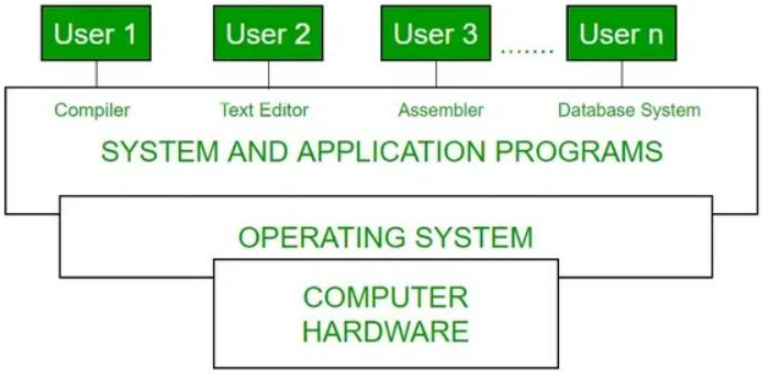
An operating system is concerned with the allocation of resources and services, such as memory, processors, devices, and information.

Every **general-purpose computer** consists of **hardware, an operating system(s), system programs,** and **application programs**.

The hardware consists of memory, CPU, ALU, I/O devices, peripheral devices, and storage devices.

The system program consists of compilers, loaders, editors, OS, etc.

The application program consists of business programs and database programs.



Conceptual View of Computer System

Advantages of Operating System

- It helps in managing the data present in the device i.e. Memory Management.
- It helps in making the best use of computer hardware.
- It helps in maintaining the security of the device.
- It helps different applications in running them efficiently.

Disadvantages of Operating System

- Operating Systems can be difficult for someone to use.
- Some OS are expensive and they require heavy maintenance.
- Operating Systems can come under threat if used by hackers.

Characteristics of Operating System

- **Virtualization:** Operating systems can provide Virtualization capabilities, allowing multiple operating systems or instances of an operating system to run on a single physical machine. This can improve resource utilization and provide isolation between different operating systems or applications.
- **Networking:** Operating systems provide networking capabilities, allowing the computer system to connect to other systems and devices over a network. This can include features such as network protocols, network interfaces, and network security.
- **Scheduling:** Operating systems provide scheduling algorithms that determine the order in which tasks are executed on the system. These algorithms prioritize tasks based on their resource requirements and other factors to optimize system performance.
- **Interprocess Communication:** Operating systems provide mechanisms for applications to communicate with each other, allowing them to share data and coordinate their activities.
- **Performance Monitoring:** Operating systems provide tools for monitoring system performance, including CPU usage, memory usage, disk usage, and network activity. This can help identify performance bottlenecks and optimize system performance.
- **Backup and Recovery:** Operating systems provide backup and recovery mechanisms to protect data in the event of system failure or data loss.
- **Debugging:** Operating systems provide debugging tools that allow developers to identify and fix software bugs and other issues in the system.

Task 1. Fill in the blanks with the words from the box.

Software applications security protection fees kernel technical data interfaces smoothly

Every computer relies on at least one OS, usually with a core program called the _____(1) that runs constantly in the background. All other software, like games or web browsers, are considered _____(2) that leverage the resources managed by the OS.

Benefits of an Operating System:

Efficiency: The OS optimizes hardware usage, ensuring applications run _____(3) without conflicts.

Organization: It keeps your _____(4) organized and accessible, making it easier to find what you need.

Security: The OS provides _____(5) against malware and unauthorized access.

Usability: User-friendly _____(6) make interacting with your computer more intuitive.

Drawbacks of an Operating System:

Learning Curve: Some OSes require more _____(7) knowledge to navigate effectively.

Cost: Certain operating systems may have licensing _____(8) or require specialized hardware.

Maintenance: Maintaining an OS can involve _____(9) updates and _____(10) patches.

Task 2. Choose the right answer.

1. **What is the main purpose of an operating system according to the passage?**
   A. To run applications
   B. To manage computer hardware
   C. To provide security against malware
   D. To organize user data
2. **Which of the following benefits of an operating system is not mentioned in the passage?**
   A. Efficiency
   B. Usability
   C. Cost
   D. Security
3. **Which of the following is identified as a drawback of an operating system in the passage?**
   A. Lack of security
   B. Inefficient hardware usage
   C. Complexity of the user interface
   D. Difficulty in finding user data
4. **What is the relationship between the operating system and applications as described in the passage?**
   A. Applications are independent of the operating system.

B. Applications are controlled by the operating system.
C. Applications utilize the resources managed by the operating system.
D. Applications are separate from the operating system's core functions.

5. **Which of the following is not listed as a benefit of an operating system in the passage?**
A. Optimizing hardware usage
B. Ensuring compatibility between applications
C. Providing data organization
D. Making user interactions more intuitive

6. **According to the passage, which of the following is required for maintaining an operating system?**
A. Upgrading the hardware
B. Installing new applications
C. Performing software updates and security patches
D. Reorganizing user data

7**. What is the primary role of the kernel in an operating system as described in the passage?**
A. It provides a user-friendly interface.
B. It manages the computer's hardware resources.
C. It runs constantly in the background.
D. It is considered a separate application.

8. **How do operating systems help in data protection?**
A. By providing backup and recovery mechanisms
B. By designing new storage devices
C. By running application programs
D. By editing database programs

9. Which of the following is NOT a characteristic of an operating system?
A. Virtualization
B. Networking
C. Data Entry
D. Performance Monitoring

10. What does the scheduling algorithm in an operating system do?
A. It schedules hardware maintenance.
B. It determines the order of task execution.
C. It manages network security.
D. It provides debugging tools.

Task 3. Match these words to the definitions.

a. finding and fixing problems or errors in software code to make it work correctly.
b. provide algorithms that determine the order in which tasks are executed on the system.
c. the process of creating a virtual version of something, like a computer system or network.
d. keeping track of how well a system or program is working and identifying areas for improvement.

e. connecting computers and other devices together to share information and resources.

1. virtualization	
2. scheduling	
3. performance monitoring	
4. debugging	
5. networking	

Task 4. Match the halves.

1. peripheral	a. management	
2. software	b. protocols	
3. recovery	c. loss	
4. memory	d. mechanisms	
5. data	e. performance	
6. operating	f. usage	
7. system	g. system	
8. maintain	h. resources	
9. memory	i. bugs	
10. debugging	j. the security	
11. network	k. devices	
12. software	l. tools	
13. scheduling	m. algorithms	

Task 5. Choose the correct answer.

1. **What is the primary role of an operating system in relation to computer hardware?**
   A. To enhance the graphics of the computer
   B. To create application programs
   C. To provide internet connectivity
   D. To manage computer hardware and software resources
2. **Which statement is true regarding application programs and operating systems?**
   A. Application programs usually require an operating system to function.
   B. Application programs can run independently of any operating system.
   C. Application programs do not require an operating system.
   D. Operating systems are only for gaming applications.
3. **Which of the following best describes the role of an operating system as a resource manager?**
   A. It manages the installation of new hardware.
   B. It creates backups of user data.

C. It allocates system resources like memory and processing power to applications.
D. It provides entertainment applications.

4. **Which of the following statements accurately describes the kernel of an operating system?**
   A. It is a tool for managing user accounts.
   B. It is the graphical interface of the operating system.
   C. It is a type of application software.
   D. It is the core program that runs at all times on the computer.
5. **What is one way operating systems help maintain security?**
   A. By providing antivirus software
   B. By managing user permissions and access
   C. By encrypting all user data automatically
   D. By blocking all internet connections
6. **What is one disadvantage of using certain operating systems?**
   A. They automatically update without user intervention.
   B. They are always free to use.
   C. They can be difficult to use and may require heavy maintenance.
   D. They enhance the performance of all applications.
7. **What is a common threat to operating systems?**
   A. Enhanced security features
   B. Hacker attacks
   C. Increased user productivity
   D. Regular software updates
8. **What is a key benefit of virtualization provided by operating systems?**
   A. It reduces the need for hardware upgrades.
   B. It improves the graphics performance of applications.
   C. It simplifies the installation of software.
   D. It allows multiple operating systems to run on a single physical machine.
9. **How do operating systems facilitate networking capabilities?**
   A. By providing tools for graphic design
   B. By allowing the computer to connect to other systems and devices over a network
   C. By managing user passwords
   D. By enhancing sound quality during playback
10. **What type of tools do operating systems provide for performance monitoring?**
    A. Tools for managing user accounts
    B. Tools for creating graphics
    C. Tools for monitoring CPU usage, memory usage, and network activity
    D. Tools for editing videos

Questions for discussion:

1. How does your computer «decide» which program works first?

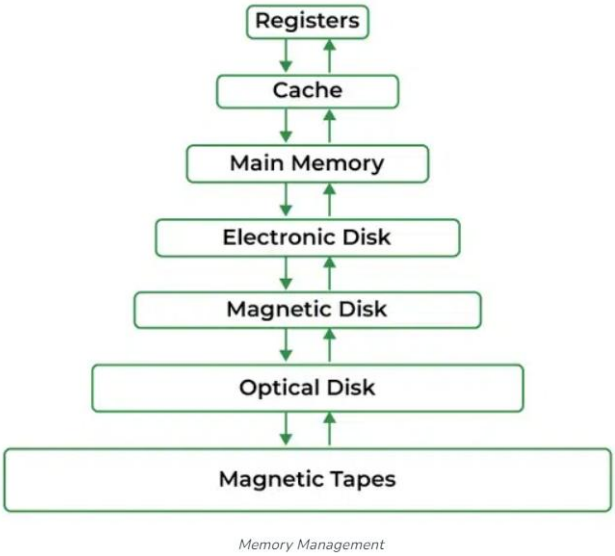
2. What happens when you open too many apps at once?
3. Who tells your CPU what to do — and when to do it?
4. Why does the system sometimes show «Not Responding»?
5. Can your computer work without an operating system?

VOCABULARY Practise the following words and word combinations.

Operating System (OS)	Операційна система
Primary / Main Memory	Основна пам’ять
Memory Allocation	Розподіл пам’яті
Deallocation of Memory	Звільнення пам’яті
Process Scheduling	Планування процесів
Processor Management	Керування процесором
File System	Файлова система
Direct Access	Прямий доступ
Multi-programming environment	Багатопрограмне середовище
Error Detection	Виявлення помилок
Unauthorized Access	Несанкціонований доступ
Data Integrity	Цілісність даних
Storage Device	Пристрій зберігання
System Monitoring	Системний моніторинг
External Threat	Зовнішня загроза
Malicious Software	Шкідливе програмне забезпечення

Functions of an Operating System

Memory Management



Memory Management

The operating system manages the **Primary Memory** or **Main Memory. Main memory** is made up of a large array of bytes or words where each byte or word is assigned a certain address. **Main memory** is fast storage and it can be accessed directly by the CPU. For a program to be executed, it should be first loaded in the main memory. An operating system manages the allocation and deallocation of memory to various processes and ensures that the other process does not consume the memory allocated to one process.

An Operating System performs the following activities for **Memory Management**:

- It keeps track of primary memory, i.e., which bytes of memory are used by which user program. The memory addresses that have already been allocated and the memory addresses of the memory that has not yet been used.
- In multiprogramming, the OS decides the order in which processes are granted memory access, and for how long.
- It Allocates the memory to a process when the process requests it and deallocates the memory when the process has terminated or is performing an I/O operation.

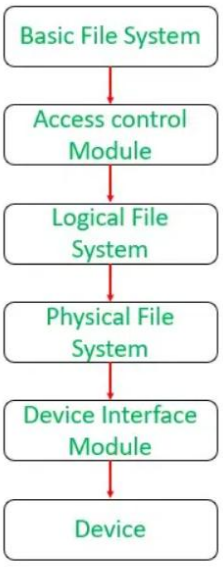
Processor Management

In a multi-programming environment, the OS decides the order in which processes have access to the processor, and how much processing time each process has. This function of OS is called Process Scheduling. An Operating System performs the following activities for Processor Management.

An operating system manages the processor's work by allocating various jobs to it and ensuring that each process receives enough time from the processor to function properly.

File Management

A **file system** is organized into directories for efficient or easy navigation and usage. These directories may contain other directories and other files. An Operating System carries out the following file management activities. It keeps track of where information is stored, user access settings, the status of every file, and more. These facilities are collectively known as the file system. An OS keeps track of information regarding the creation, deletion, transfer, copy, and storage of files in an organized way. It also maintains the integrity of the data stored in these files, including the file directory structure, by protecting against unauthorized access.



File Management

Error-Detecting Aids

The operating system constantly monitors the system to detect errors and avoid malfunctioning computer systems. From time to time, the operating system checks the system for any external threat or malicious software activity. It also checks the hardware for any type of damage. This process displays several alerts to the user so that the appropriate action can be taken against any damage caused to the system.

Task 6. Choose the correct answer.

1. What is the primary function of the operating system in managing the main memory?
   A. To keep track of which parts of the memory are currently in use
   B. To decide the order in which processes access the CPU
   C. To protect against unauthorized access to files
   D. To monitor the system for errors and malfunctions
2. **Which of the following is NOT a responsibility of the operating system's processor management?**
   A. Allocating the CPU to different processes
   B. Ensuring each process receives sufficient processing time
   C. Maintaining file directory structures
   D. Determining the order of process execution
3. **What is the main purpose of the operating system's file management capabilities?**
   A. To detect and prevent external threats to the system
   B. To keep track of file creation, deletion, and storage details
   C. To allocate and deallocate memory to running processes
   D. To decide which processes have access to the CPU
4. **What is the primary role of the operating system's error-detecting aids?**
   A. To monitor the system for hardware damage and software issues
   B. To organize files and directories for efficient access
   C. To manage the allocation of main memory to various processes
   D. To determine the scheduling of processes on the CPU

5. **Which of the following is NOT a key responsibility of the operating system in memory management?**

A. Keeping track of which parts of memory are in use
B. Deciding the order of process execution
C. Allocating memory to processes upon request
D. Deallocating memory when a process terminates

6. **Which of the following activities is NOT related to the operating system's processor management functions?**

A. Ensuring each process receives adequate CPU time
B. Determining the order in which processes access the CPU
C. Allocating the CPU to different running processes
D. Maintaining the integrity of data stored in files

7**. What is the primary purpose of the operating system's file management system?**

A. To monitor the system for potential errors and malfunctions
B. To manage the allocation of main memory to processes
C. To decide the scheduling of processes on the CPU
D. To track the creation, deletion, and storage of files

8.**During multiprogramming, what does the OS decide regarding memory access?**

A. The speed of the processor
B. The order of process execution and duration of memory access
C. The amount of disk space required
D. The user interface layout

9.**What does an OS do when a process requests memory allocation?**

A. It terminates the process immediately
B. It allocates the requested memory and deallocates it upon process termination or I/O operation
C. It defrags the hard drive
D. It increases CPU clock speed

10.**What is Process Scheduling in the context of processor management?**

A. Allocating time slots for memory access
B. Managing file creation and deletion
C. Deciding the order and time each process has access to the CPU
D. Controlling network traffic

11**.What is the purpose of error-detecting aids in an OS?**

A. To install new software updates
B. To improve graphics rendering
C. To increase processing power
D. To monitor the system, detect errors, and avoid malfunctioning+

12.**Which of the following is a part of the OS's error-detecting process?**

A. Running antivirus software
B. Monitoring system hardware and software for damage or threats+
C. Optimizing memory usage
D. Installing device drivers

13. **What action does the OS take when an external threat is detected?**

A. It shuts down the system immediately
B. It disconnects from the internet
C. It formats the hard drive
D. It displays alerts to the user for appropriate action+

Task 7. Fill in the blanks with the words from the box.

permissions hardware data upholds setting facilitate prevent sequence scans preventing identify carries

The OS consistently monitors the system to _____(1) errors and _____(2) system malfunctions. Periodically, it _____(3) the system for external threats or malicious software activities. It also inspects the _____(4) for any signs of damage.

In a multi-programming _____(5), the operating system (OS) determines the _____(6) in which tasks can utilize the processor and the duration each task can use it. The OS _____(7) the following tasks for Processor Management.

A file system is structured into directories to _____(8) easy navigation and utilization. The OS performs the following file management functions: it keeps tabs on the storage location of _____(9), user _____(10), the status of each file, and more. These functions together form the file system. It also _____(11) the integrity of the stored data, including the file directory structure, by _____(12) unauthorized access.

Task 8. Match the definitions with its explanation.

1. file management	
2. error-detecting aids	
3. processor management	
4. memory management	
5. primary memory	

a. tools or mechanisms that help identify and correct errors in computer systems.
b. the coordination and control of a computer's central processing unit to ensure efficient performance.
c. the main storage area in a computer where data is temporarily stored for processing.
d. handling the allocation and deallocation of computer memory resources to optimize performance.
e. organizing, storing, and retrieving data on a computer system in an orderly manner.

Task 9. Read the sentences and find out false ones. Correct them.

1. Main memory is slow storage and cannot be accessed directly by the CPU.

2. The operating system controls the distribution and release of memory to different processes to prevent one process from using another's memory.
3. The author lists the activities performed by an Operating System for Memory Management.
4. The operating system does not allocate jobs to the processor.
5. Directories are used in a file system for easy navigation and efficient usage.
6. In the future, Operating Systems will no longer carry out file management activities.
7. The operating system continuously checks the system for errors to prevent computer malfunctions.
8. The process does not provide any alerts to the user.

Term / Expression	Definition / Explanation
Operating System (OS)	System software that manages hardware, software resource and provides essential services for computer programs.
System Software	Software designed to run the computer's hardware ar application programs (includes the OS, drivers, and utilities
Application Program	A program designed to perform specific tasks for the use such as a word processor or spreadsheet.
Kernel	The core part of the OS that remains in memory and manag low-level operations like memory, CPU, and device contro
Resource Manager	The OS component responsible for managing CPU tim memory, files, and input/output devices among users ar applications.
Virtualization	The creation of virtual versions of computing resource allowing multiple operating systems to run on one physic machine.
Networking	OS functionality that enables communication and da exchange between computers over a network.
Scheduling	The process of deciding which tasks or processes get acce to the CPU and in what order.
Interprocess Communication (IPC)	Mechanisms that allow processes to share information ar coordinate their actions within the system.
Performance Monitorin	Tools and methods used by the OS to observe and optimiz system performance (CPU, memory, disk, network usage).

Term / Expression	Definition / Explanation
Backup and Recovery	Features that allow saving copies of data and restoring the in case of loss or failure.
Debugging	Identifying and fixing software bugs or system errors.
Memory Management	OS function that tracks which parts of memory are used ar allocates/deallocates memory as needed.
Processor Management	The OS's control over how processor time is shared amor multiple tasks or processes.
Process Scheduling	The method used by the OS to assign CPU time to variou processes.
File Management	Managing data storage, retrieval, organization, acce control, and file operations (create, delete, copy, move).
Directory Structure	Hierarchical arrangement of folders and files within the fi system.
Error Detection	Continuous monitoring of the system to identify and repo hardware or software errors.
Malicious Software (Malware)	Harmful software such as viruses or spyware that can damag or disrupt a computer system.
Data Integrity	Ensuring that data remains accurate, consistent, and protecte from unauthorized modification.
Primary Memory	Fast, temporary storage directly accessible by the CPU whe data and programs are loaded for processing.
Process Scheduling	The method by which the OS decides which process runs ne and how much CPU time it gets.
System Security	Measures used by the OS to prevent unauthorized access ar ensure safe data handling.
Deallocation	The process of freeing up memory or resources that are no long needed.
User Access Settings	Permissions that define what actions each user can perfor within the system.

Unit 20. Operating Systems. Types

Questions for discussion:

1. What exactly makes these systems different?
2. Why can some run many programs at once while others are designed just for one specific function?

Task 1. Scan Qr-code and learn new phrases.

VOCABULARY Practise the following words and word combinations.

Operating system (OS)	операційна система
single-tasking	однозадачна
multi-tasking	багатозадачна
concurrency	одночасне виконання
time-sharing	розподіл часу
process	процес
task scheduling	планування завдань
pre-emptive multitasking	витісняюча багатозадачність
co-operative multitasking	кооперативна багатозадачність
single-user system	однокористувацька система
multi-user system	багатокористувацька система
distributed operating system	розподілена операційна система
distributed computing	розподілені обчислення
virtual machine (VM)	віртуальна машина
templating	створення шаблонів
virtualization	віртуалізація
cloud computing	хмарні обчислення
embedded system	вбудована система

real-time operating system (RTOS)	операційна система реального часу
scheduling algorithm	алгоритм планування
deterministic behavior	детермінована поведінка
event-driven system	система, керована подіями
clock interrupt	переривання таймера
resource allocation	розподіл ресурсів
accounting software	облікове програмне забезпечення

Task 2. Read the text.

Types of operating systems:

Single- and multi-tasking

A **single-tasking system** can only run one program at a time, while a multi-tasking operating system allows more than one program to be running in concurrency. This is achieved by time-sharing, dividing the available processor time between multiple processes which are each interrupted repeatedly in time-slices by a task scheduling subsystem of the operating system. **Multi-tasking** may be characterized in **pre-emptive** and **co-operative** types.

In **pre-emptive** multitasking, the operating system slices the CPU time and dedicates a slot to each of the programs. Unix-like operating systems, e.g., Solaris, Linux, as well as AmigaOS support pre-emptive multitasking.

Cooperative multitasking is achieved by relying on each process to provide time to the other processes in a defined manner. 16-bit versions of Microsoft Windows used cooperative multi-tasking. 32-bit versions of both Windows NT and Win9x, used pre-emptive multi-tasking.

Single- and multi-user

Single-user operating systems have no facilities to distinguish users, but may allow multiple programs to run in tandem. **A multi-user** operating system extends the basic concept of multi-tasking with facilities that identify processes and resources, such as disk space, belonging to multiple users, and the system permits multiple users to interact with the system at the same time. Time-sharing operating systems schedule tasks for efficient use of the system and may also include accounting software for cost allocation of processor time, mass storage, printing, and other resources to multiple users.

Distributed operating system

A distributed operating system manages a group of distinct computers and makes them appear to be a single computer. The development of networked computers that could be linked and communicate with each other gave rise to distributed computing. Distributed computations are carried out on more than one machine. When computers in a group work in cooperation, they form a distributed system.

Templated

In an OS, distributed and cloud computing context, templating refers to creating a single virtual machine image as a guest operating system, then saving it as a tool for multiple running virtual machines (Gagne, 2012, p. 716). The technique is used both in virtualization and cloud computing management, and is common in large server warehouses.

Embedded

Embedded operating systems are designed to be used in embedded computer systems. They are designed to operate on small machines like PDAs with less autonomy. They are able to operate with a limited number of resources. They are very compact and extremely efficient by design. Windows CE and Minix 3 are some examples of embedded operating systems.

Real-time

A **real-time operating system** is an operating system that guarantees to process events or data within a certain short amount of time. A real-time operating system may be **single-** or **multi-tasking**, but when multitasking, it uses specialized scheduling algorithms so that a deterministic nature of behavior is achieved. An event-driven system switches between tasks based on their priorities or external events while time-sharing operating systems switch tasks based on clock interrupts.

Task 3. Choose the correct answer.

1. **Which type of operating system can only run one program at a time?**
   A. Multi-tasking operating system
   B. Single-tasking operating system
   C. Real-time operating system
   D. Distributed operating system
2. **What is the main purpose of time-sharing in a multi-tasking operating system?**
   A. To ensure that each process is allocated an equal amount of CPU time
   B. To allow multiple users to access the system simultaneously
   C. To divide the available processor time between multiple running programs
   D. To provide accounting software for cost allocation of system resources
3. **Which type of multi-tasking is typically used in modern versions of Windows?**
   A. Co-operative multi-tasking
   B. Pre-emptive multi-tasking
   C. Real-time multi-tasking
   D. Distributed multi-tasking
4. **Which type of operating system is designed to operate on small devices with limited resources?**
   A. Distributed operating system
   B. Real-time operating system
   C. Embedded operating system

D. Templated operating system

5. **What is the key feature that distinguishes a distributed operating system from other types?**

A. Its ability to manage resources belonging to multiple users
B. Its use of pre-emptive multi-tasking to ensure deterministic behavior
C. Its focus on providing real-time performance guarantees
D. Its ability to make a group of distinct computers appear as a single system

6. **What is the main advantage of using template-based virtualization in cloud computing?**

A. It allows for more efficient use of system resources
B. It enables real-time performance guarantees for all running tasks
C. It provides the ability to manage a group of distinct computers as a single system
D. It allows for the creation of a single virtual machine image that can be used to spawn multiple virtual machines

7**. What is the key characteristic that defines a real-time operating system?**

A. Its ability to manage resources belonging to multiple users
B. Its use of pre-emptive multi-tasking to ensure deterministic behavior
C. Its focus on operating on small, embedded devices with limited resources
D. Its guarantee to process events or data within a certain short amount of time

8. **Which of the following operating systems supports pre-emptive multitasking?**

A.16-bit versions of Microsoft Windows
B.Windows CE
C.Unix-like operating systems (e.g., Solaris, Linux)
D.16-bit versions of Microsoft Windows

9. **What is a characteristic feature of a multi-user operating system?**

A. It can only run one program at a time
B. It does not distinguish between different users
C. It allows multiple users to interact with the system simultaneously
D. It is designed for embedded systems with limited resources

10. **What does templating refer to in the context of virtualization and cloud computing?**

A. Creating multiple virtual machine images for single use
B. Creating a single virtual machine image to be used as a template for multiple virtual machines
C. Embedding operating systems into small devices
D. Scheduling tasks based on clock interrupts

Task 4. Match the type of OS with its explanation.

1. single- and multi-user	
2. real-time os	
3. embedded os	
4. single- and multi-tasking	
5. templated os	
6. distributed operating system	

a. an OS that runs on multiple computers connected through a network, working together as a single system.

b. the ability of an operating system to handle one task at a time or multiple tasks concurrently.

c. an operating system that guarantees a certain response time for critical tasks, often used in applications where timing is crucial.

d. operating systems that can be used by one person at a time or multiple people simultaneously.

e. an operating system specifically designed to run on embedded devices like smartphones, tablets, and IoT devices.

f. an operating system that is designed with pre-defined templates for specific purposes or industries.

Task 5. Fill in the blanks with the words from the box.

simultaneously management creating different common guest identifying interrupted allocated time enables

A single-tasking system can only run one program at a time, while a multi-tasking operating system _____(1) multiple programs to run concurrently. This is done through time-sharing, where each program is _____(2) in time-slices by a task scheduling subsystem. In pre-emptive multitasking, the CPU time is sliced and _____(3) to each program. Cooperative multitasking relies on processes to allocate _____(4) to each other.

Single-user operating systems do not differentiate between users but can run multiple programs _____(5). On the other hand, multi-user operating systems extend multi-tasking by _____(6) processes and resources belonging to _____(7) users, allowing multiple users to interact with the system simultaneously.

In the context of distributed and cloud computing, templating involves _____(8) a virtual machine image as a _____(9) OS, which can be saved and used for multiple virtual machines. This technique is

_____(10) in virtualization and cloud computing _____(11), particularly in large server warehouses.

Task 6. Match the halves.

1. cloud computing	a. algorithms
2. carry	b. sharing
3. time-	c. system
4. multi-user	d. out
5. pre-emptive	e. operating system
6. clock	f. multitasking
7. single-tasking	g. management
8. scheduling	h. interrupts

_____

_____

_____

_____

_____

_____

_____

_____

Task 7. Scan QR-code and do the Task.

Task 8. Scan QR-code and do the Tasks.

GLOSSARY TO THE TOPIC

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Term / Expression	Definition / Explanation
Operating System (OS)	The main software that manages computer hardware and software resources and provides common services for computer programs.

Term / Expression	Definition / Explanation
Single-tasking OS	An operating system that can run only one program at a time.
Multi-tasking OS	A system that allows several programs to run at the same time by sharing CPU time between them.
Pre-emptive Multitasking	A type of multitasking where the OS controls CPU time and gives each process a fixed time slice automatically.
Co-operative Multitasking	A multitasking system where each program must voluntarily give control back to the OS so others can run.
Single-user OS	An operating system designed for one user at a time, though it may run multiple applications simultaneously.
Multi-user OS	An OS that allows several users to access the system and its resources at the same time, often through time-sharing.
Distributed Operating System	A system that manages multiple computers so they work together and appear as a single system.
Templating	In virtualization, creating one master virtual machine image that can be duplicated to create multiple virtual systems.
Virtual Machine (VM)	A software-based emulation of a computer that runs its own operating system.
Embedded Operating System	An OS designed for small or specialized devices (e.g. PDAs, smart TVs, IoT devices) with limited resources.
Real-time Operating System (RTOS)	A system that processes data and responds to inputs within a guaranteed short time; used in robotics, medical, or industrial systems.
Event-driven System	A system that changes tasks based on events or priorities, rather than on fixed time intervals.
Time-sharing	A method of sharing CPU time between several users or processes efficiently.
Task Scheduling	The process of deciding which tasks run at what time and for how long.
Deterministic Behavior	A predictable and reliable response to events in a specific time frame — crucial in real-time systems.
Virtualization	A technology that allows multiple virtual machines to run on a single physical computer.
Cloud Computing	Providing computing resources (servers, storage, software) over the internet on demand

Unit 21. ICT English: Jobs in Computing

Questions for discussion:

1. What IT professions do you know?
2. Do you think that IT is only about programming?
3. In your opinion, which role in a team is the most responsible – analytics, development, or support?
4. What job would you like to try: analyst, programmer, designer, administrator, or support specialist?
5. Why is an IT team similar to a football team – and what happens if 'one player' does not do their part?

VOCABULARY Practise the following words and word combinations.

ICT (Information and Communicatic Technology)	інформаційно-комунікаційні технології
project manager	керівник проєкту
database analyst	аналітик баз даних
network analyst	аналітик мереж
systems analyst	системний аналітик
web designer / webmaster	вебдизайнер / адміністрато сайту
web application	вебзастосунок
software engineer	інженер-програміст
application programmer	прикладний програміст
systems programmer	системний програміст
hardware engineer	інженер з апаратної забезпечення
security specialist	фахівець із безпеки
malware	шкідливе програмн забезпечення
virus	вірус
spyware	шпигунська програма

network administrator	адміністратор мережі
computer systems administrator	адміністратор комп'ютерних систем
database administrator	адміністратор баз даних
computer operator	оператор комп'ютера
help desk technician	технік служби підтримки
troubleshooting	усунення несправностей
computer training instructor / trainer	інструктор з навчання користувачів
technical writer	технічний письменник
data processing	обробка даних

Task 1. Scan Qr-code and learn new phrases.

https://quizlet.com/ua/1109101114/jobs-in-computing-flash-cards/?i=4emm0d&x=1jqt

Task 2. Read the text. Find out new words and word-combinations.

Jobs in computing Most ICT-related jobs have developed to meet the need to analyze, design, develop, manage or support computer software, hardware or networks. All the people involved in the different stages of development of a computer project, i.e. analysts, programmers, support specialists, etc. are controlled by a project manager.

ANALYZE

A **database analyst** is in charge of the research and development of databases; **network analysts** study the network requirements and recommend the most suitable type of network; **systems analysts** decide what ICT system will cater for the requirements of a specific institution.

DESIGN AND DEVELOP

Web designers, also called webmasters, create and maintain web pages and web applications for websites. **Software engineers**, either application programmers or systems programmers, plan, design, and test computer programs. **Hardware engineers** design and develop ICT devices. **Security specialists** specialize in the design of software and hardware to protect information from malware: viruses, spyware, etc.

MANAGE

Network or computer systems administrators install and maintain networks.

Database administrators manage the accuracy and efficiency of databases. SUPPORT **Computer operators** control computer data processing. **Help desk technicians** are in charge of troubleshooting, the solution of technical problems. **Computer training instructors** or trainers teach people how to use hardware and software. **Technical writers** write the instructions for ICT systems.

VOCABULARY Key Terms and Definitions

1. **Project Manager** – A person who controls and coordinates all stages of a computer project.
2. **Database Analyst** – A professional responsible for researching and developing databases.
3. **Network Analyst** – A person who studies network requirements and recommends appropriate solutions.
4. **Systems Analyst** – A specialist who defines ICT systems based on institutional needs.
5. **Web Designer / Webmaster** – Someone who creates and maintains websites and web applications.
6. **Software Engineer** – A person who plans, designs, and tests software programs.
7. **Hardware Engineer** – A professional who designs and develops physical ICT devices.
8. **Security Specialist** – A person focused on protecting ICT systems from malware.
9. **Network Administrator** – A technician who installs and maintains computer networks.
10. **Database Administrator** – A person who ensures databases are accurate and efficient.
11. **Computer Operator** – A person who manages data processing using computers.
12. **Help Desk Technician** – A person who provides technical support and solves problems.
13. **Computer Training Instructor / Trainer** – Someone who teaches people how to use ICT systems.
14. **Technical Writer** – A person who writes manuals and instructions for ICT systems.

Task 3. Match the Job with the Description

1. Security Specialist
2. Web Designer
3. Project Manager
4. Help Desk Technician
5. Technical Writer
6. Database Administrator
7. Software Engineer
8. Computer Training Instructor

A. Writes guides and manuals for systems.
B. Provides solutions to users' technical issues.
C. Plans and supervises all steps of a computing project.
D. Keeps databases accurate and efficient.
E. Creates and updates websites and apps.
F. Builds and tests software programs.

G. Secures systems against malware and viruses.
H. Teaches how to use hardware and software.

Task 4. Use one of the job titles to complete each sentence.

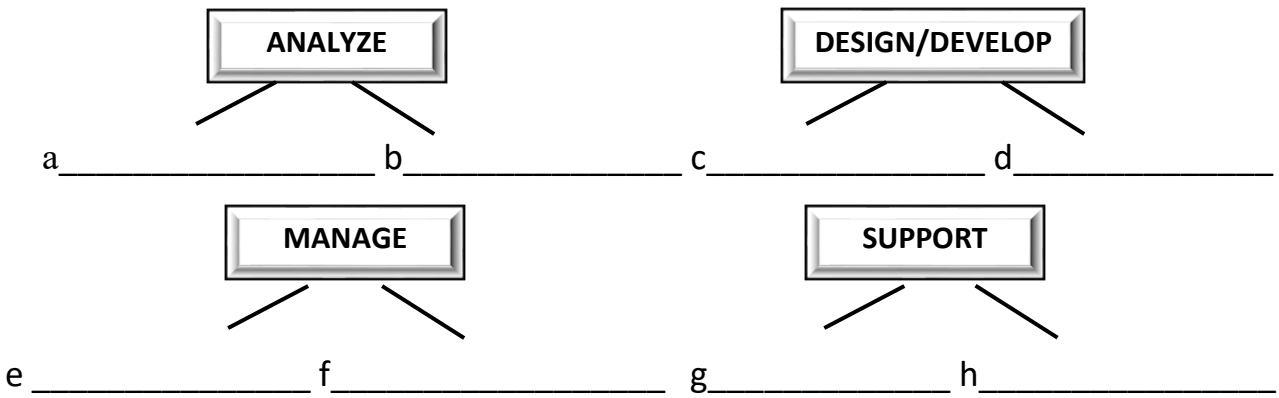
1. A _____ helps protect your system from cyberattacks.
2. When a user has trouble with their email, a _____ can assist.
3. If your website needs a new layout, contact a _____.
4. A _____ can show employees how to use new accounting software.
5. To make sure your database is fast and correct, hire a _____.
6. A _____ plans the whole project and checks every step.
7. Someone who writes user guides and system documentation is called a _____.
8. Before developing a new app, you need a _____ to define the needed system.

Task 5. Mark each statement as True (T) or False (F).

1. A network administrator designs websites. ☐
2. A systems analyst defines what system a company needs. ☐
3. A hardware engineer solves email issues. ☐
4. A software engineer develops apps. ☐
5. A help desk technician writes software programs. ☐

Task 6. Classify these jobs under the heading that best describes their function.

software engineer	help desk technician	trainer
network analyst	hardware engineer	network administrator
database administrator	system analyst	



Task 7. Draw lines between the columns to make true sentences about jobs.

1. A technician	a. designer	a. controls all the operation and people in a project	1. _____
2. A project	b. writer	b. writes documentation of a program or	2. _____

		device		
3. A web	c. specialist	c. plans and keeps websites updated		3.
4. A security	d. manager	d. designs application against virues		4.

Task 8. Open the program https://www.socrative.com/ and scan the Qr-code for the test-game.

Task 9. Complete each sentence by choosing the correct form using Present Simple or Present Continuous.

1. The help desk technician usually _____(solve) technical problems.
2. At the moment, our network administrator _____ (update) the company's firewall.
3. A systems analyst _____ (define) user requirements for a new project every month.
4. Look! The web designer_____ (upload) the final version of the site.
5. Our project manager _____ (not meet) clients regularly to discuss progress.
6. Now the technical writer _____ (write) a new user manual.
7. Engineers often _____ (test) software before release.
8. Today, our trainer_____ (not teach) a group of beginners.

Task 9. Complete the sentences with a suitable modal verbs for Advice and Obligation (should, must, have to, don't have to, shouldn't)

1. You _____ update the security software regularly.
2. Engineers _____ follow company guidelines when testing software.
3. You _____ share passwords with others.
4. Users _____ install updates themselves if they lack experience.
5. Database administrators _____ back up the system every day.

Task 10. Complete the sentences using the First Conditional.

1. If we _____ (not fix) the bug today, it _____ (cause) delays in the release.
2. If the server _____(go down), users _____ (not/be) able to log in.
3. If you _____(train) the staff well, they _____ (use) the new system efficiently.
4. If she_____ (hire) a skilled technician, he _____ (solve) the issue faster.
5. If the system _____(be updated) tonight, we _____ (avoid) errors tomorrow.

Task 11. Complete the sentences using the Second Conditional.

1. If I _____(be) a software engineer, I _____ (develop) a mobile app for students.
2. If our company _____(hadve) more resources, we _____ (upgrade) all the computers.
3. Users _____ (lose) fewer files if they_____ (save) their work more often.
4. If the network _____(be) more stable, we _____ (not/need) constant support.
5. What _____ you _____ (do) if your hard drive _____(fail)?

Task 12. Rewrite the sentences in reported speech.

1. The trainer said, "You can use this tool to test code."
2. The technician said, "We updated the server last night."
3. The manager said, "Our team is working on a new interface."
4. The user said, "I don't understand how to install the software."
5. The engineer said, "I will finish the script by Friday."

Term	Definition / Explanation
Project Manager	A person responsible for planning, organizing, and supervising all stages of a computer project.
Database Analyst	A specialist who researches, designs, and improves databases to ensure they meet organizational needs.
Network Analyst	A professional who studies the communication needs of an organization and suggests the best network solutions.
Systems Analyst	A person who identifies and designs ICT systems to meet the specific requirements of users or institutions.
Web Designer (Webmaster)	A specialist who creates, designs, and maintains websites and web applications.
Software Engineer	A programmer who designs, develops, and tests computer software. They can focus on applications or system software.
Application Programmer	A developer who creates programs for end users, such as word processors or accounting systems.
Systems Programmer	A professional who writes programs that control computer systems or hardware (e.g. operating systems).

Term	Definition / Explanation
Hardware Engineer	A person who designs and develops physical components of computers and ICT devices.
Security Specialist	An expert who creates systems to protect computers and data from viruses, spyware, and other cyber threats.
Network Administrator	A technician who installs, configures, and maintains computer networks.
Database Administrator (DBA)	A specialist who ensures databases run efficiently, remain accurate, and are well-secured.
Computer Operator	A person who controls the operation of computer systems, especially data processing.
Help Desk Technician	A support worker who helps users solve hardware and software problems.
Computer Training Instructor / Trainer	A teacher who educates people on how to use computer hardware and software effectively.
Technical Writer	A person who writes user manuals, guides, and documentation for ICT systems.
Troubleshooting	The process of identifying and fixing technical problems or errors in hardware or software.
Malware	Any software designed to harm or exploit computers or networks.
Spyware	A type of malware that secretly collects user data and activities.
Virus	A malicious program that replicates itself and spreads to other computers.

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