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ІНОЗЕМНА МОВА

за професійним спрямуванням

Методичні вказівки до самостійної роботи
для здобувачів освітньо-професійного ступеня
фаховий молодший бакалавр
спеціальності 122 Комп'ютерні науки
денної форми здобуття освіти



Ковель, 2024

Затверджено до видання методичною радою ВСП «КПЕФК ЛНТУ»
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Голова методичної ради ВСП «КПЕФК ЛНТУ» _____ Ігор ІЛЮШИК

Розглянуто і схвалено на засіданні циклової комісії зі словесних та суспільних освітніх компонентів ВСП «Ковельський промислово-економічний фаховий коледж ЛНТУ», протокол № _____ від «_____» _____ 2024 року.

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А 64 Іноземна мова за професійним спрямуванням [Текст]: методичні вказівки до самостійної роботи для здобувачів освітньо-професійного ступеня фаховий молодший бакалавр спеціальності 122 Комп'ютерні науки денної форми здобуття освіти/уклад. Оксана Грисюк. – Ковель: ВСП «КПЕФК ЛНТУ», 2024. – 47с.

Видання містить методичні вказівки до самостійної роботи з освітнього компонента Іноземна мова за професійним спрямуванням. Вони направлені на активізацію лексичного та граматичного матеріалу, розширення словникового запасу фаховою термінологією; удосконалення комунікативних вмінь та навичок володіння англійською мовою при спілкуванні на професійні теми. Призначене для здобувачів освітньо-професійного ступеня фаховий молодший бакалавр спеціальності 122 Комп'ютерні науки денної форми здобуття освіти.

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ПЕРЕДМОВА

Самостійна робота здобувачів освіти з освітнього компонента Іноземна мова (за професійним спрямуванням) є складовою освітнього процесу, важливим чинником, який формує вміння навчатися, сприяє активізації засвоєння здобувачем освіти знань. Самостійна робота здобувачів освіти є основним засобом опанування навчального матеріалу у позааудиторний час. Мета самостійної роботи здобувачів освіти — сприяти засвоєнню в повному обсязі навчальної програми та формуванню самостійності як важливої професійної якості, сутність якої полягає в умінні систематизувати, планувати та контролювати власну діяльність.

Розвиток комп'ютерної техніки не тільки якісно змінює життя суспільства, але й впливає на культуру, залучає людство до накопичення культурного багатства. Інформатизація суспільства стимулює якісні зміни в соціально-політичних й економічних процесах. Нові інформаційні технології орієнтують людину на саморозвиток та самонавчання.

Методичні вказівки до самостійної роботи призначені для підготовки здобувачів освіти зі спеціальності 122 Комп'ютерні науки.

Мета методичних вказівок – навчити майбутнього фахівця вільно орієнтуватися в сучасному англomовному інформаційному потоці, з метою поглиблення фахових знань та отримання нової інформації; удосконалити навички вільного читання й розуміння текстів професійної спрямованості; збагатити словниковий запас фаховою термінологією; удосконалити комунікативні вміння та навички володіння англійською мовою при спілкуванні на професійні теми; навчити реферувати тексти технічного характеру англійською мовою та формулювати власну думку щодо прочитаного; опанувати лексичний та граматичний матеріал.

Підібраний навчальний матеріал та система вправ націлені на формування ефективної міжкультурної комунікації як у письмовій, так і в усній формах.

Самостійна робота № 1

Theme *The Magic of Computers*

Task 1. You are going to read a text about some of the other things that computers are used for. Five sentences have been removed from the text. Choose which sentence (1-5) fits which gap in the text (a-e).

1. It is a calculating machine that speeds up financial calculations.
2. We visit shops and offices which have been designed with the help of computers.
3. You can even use your PC to relax with computer games.
4. For example calculators, the car's electronic ignition, the timer in the microwave, or the programmer inside the VCR.
5. As does making a flight reservation or bank transaction.

Reading. The Magic of Computers

Computers and microchips have become part of our everyday lives: (a)...; we pay bills prepared by computers; just picking up a telephone and dialling a number involves the use of a sophisticated computer system, (b)

Every day we encounter computers that spring to life the instant they are switched on, (c)..., all of which use chip technology.

What makes your computer such a miraculous device? Each time you turn it on, it is a blank slate (tabula rasa) that, with appropriate hardware and software, is Capable of doing anything you ask. (d)...; it is an electronic filing cabinet which manages large collections of data, such as customers' lists, accounts, or inventories; it is a magical typewriter that allows you to type and print any kind of document - letters, memos or legal documents; it is a personal communicator that enables you to interact with other computers and with people around the world; if you like gadgets and electronic entertainment, (e).

Nowadays, it is almost impossible to imagine life without the magic of computers.

Task 2. Read the text again and answer these questions.

1. Apart from computers, what other devices use microchips?
2. Which two components allow computer systems to operate?
3. What types of document are prepared on computers?
4. Why is a computer called a personal communicator?

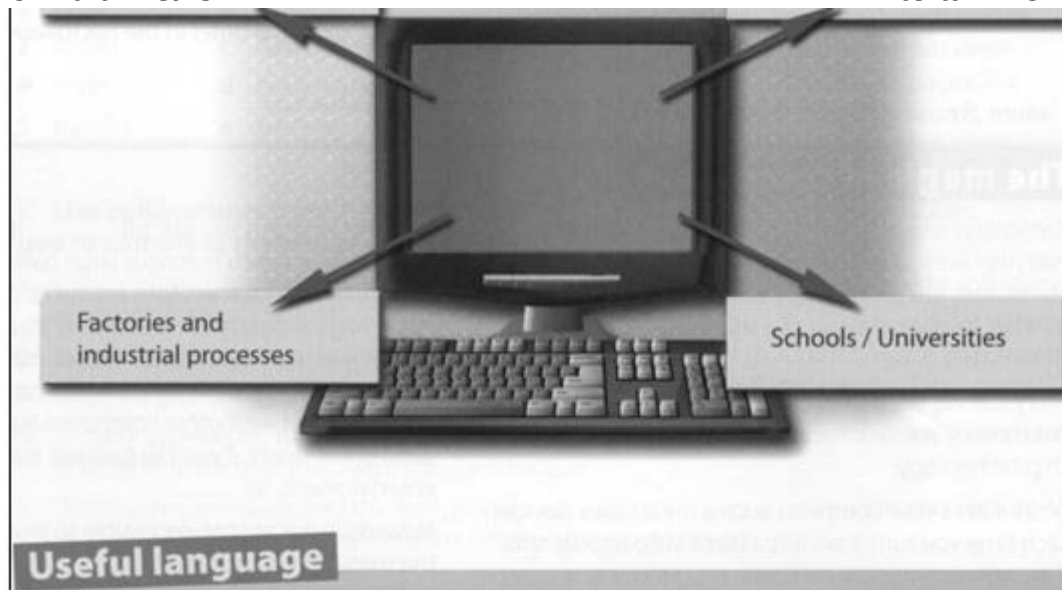


Other Applications

Task 3. In small groups, choose one of the areas in the diagram below and discuss what you can do with computers in that area. Look at the Useful language box below to help you.

Formula 1 cars

Entertainment



Formula 1 cars: design and build the car, test virtual models, control electronic components, monitor engine speed, store (vital) information, display data, analyse and communicate data.

Entertainment: download music, burn CDs, play games, take photos, edit photos, make video clips, watch movies on a DVD player, watch TV on the computer, listen to MP3s, listen to the radio via the Web.

Factories and industrial processes: design products, do calculations, control industrial robots, control assembly lines, keep record of stocks (materials and equipment).

School/University: access the Internet, enroll online, search the Web, prepare exams, write documents, complete exercises online, do research, prepare presentations.

Computers are used to...
PC can also be used for...
People use computers to...

Writing. Write a short presentation summarizing your discussion. Then ask one person from your group to give a summary of the group's ideas to the rest of the class.

Questions for Self Control

1. What are the main ways to use ICT in your life?
2. How was the life changed with ICT?

Самостійна робота № 2

Theme *The Collectives of Cyberspace*

Task 1. Read the article and find websites for the following tasks.

1. To search for information on the Web;
2. to buy books and DVDs;
3. to participate in political campaigns;
4. to view and exchange video clips;
5. to manage and share personal photos using tags;
6. to buy and sell personal items in online auctions;
7. to download music and movies, sometimes illegally.

Reading. Tour the Collectives of Cyberspace

The Internet isn't just about email or the Web anymore. Increasingly, people online are taking the power of the Internet back into their own hands. They're posting opinions on online journals - weblogs, or blogs; they're organizing political rallies on **MoveOn.org**; they're trading songs on illegal file -sharing networks; they're volunteering articles for the online encyclopedia **Wikipedia**; and they're collaborating with other programmers around the world. It's the emergence of the 'Power of Us'.

Thanks to new technologies such as blog software, peer-to-peer networks, open-source software, and wikis, people are getting together to take collective action like never before.

eBay, for instance, wouldn't exist without the 61 million active members who list, sell, and buy millions of items a week. But less obvious is that the whole marketplace runs on the trust created by eBay's unique feedback system, by which buyers and sellers rate each other on how well they carried out their half of each transaction.

Pioneer e-tailer **Amazon** encourages all kinds of customer participation in the site - including the ability to sell items alongside its own books, CDs, DVDs and electronic goods.

MySpace and **Facebook** are the latest phenomena in social networking, attracting millions of unique visitors a month. Many are music fans, who can blog, email friends, upload photos, and generally socialize.

There's even a 3-D virtual world entirely built and owned by its residents, called **Second Life**, where real companies have opened shops, and pop stars such as U2 have performed concerts. Some sites are much more specialized, such as the photo-sharing site **Flickr**. There, people not only share photos but also take the time to attach tags to their pictures, which help everyone else find photos of, for example, Florence, Italy.

Another successful example of a site based on user-generated content is **YouTube**, which allows users to upload, view and share movie clips and music videos, as well as amateur video blogs.

Another example of the collective power of the Internet is the **Google** search engine. Its mathematical formulas surf the combined judgments of millions of people whose websites link to other sites. When you type Justin Timberlake into Google's search box and go to the star's official website, the site is listed first because more people are telling you it's the most relevant Justin Timberlake site - which it probably is.

Skype on the surface looks like software that lets you make free phone calls over the Internet - which it does. But the way it works is extremely clever. By using Skype, you're automatically contributing some of your PC's computing power and Internet connection to route other people's calls. It's an extension of the peer-to-peer network software such as **Bit Torrent** that allow you to swap songs - at your own risk if those songs are under copyright. Bit Torrent is a protocol for transferring music, films, games and podcasts. A podcast is an audio recording posted online. Podcasting derives from the words *iPod* and *broadcasting*. You can find podcasts about almost any topic - sports, music, politics, etc. They are distributed through RSS (Really Simple Syndication) feeds which allow you to receive up-to-date information without having to check the site for updates. Bit Torrent breaks the files into small pieces, known as chunks, and distributes them among a large number of users; when you download a torrent, you are also uploading it to another user. (*adapted from Business Week on-line*).

Task 2. Read the article again and match the sentence beginnings (1-5) with the correct endings (a-e).

1. A weblog , or blog, is an electronic journal
 2. A peer-to-peer system allows
 3. You can use a search engine to find
 4. Bit Torrent is a peer-to-peer protocol used
 5. RSS keeps you constantly informed
-
- a. web pages on a particular subject.
 - b. for downloading files over the Internet.
 - c. users to share files on their computers.
 - d. about fresh, new content on your favourite websites.
 - e. that displays in chronological order the postings of one or more people.

Task 3. Find words in the article with the following meanings.

1. open-source, editable web pages;
2. the same as electronic retailer, or online store;
3. a blog that includes video;
4. a program that allows you to make voice and video calls from a computer;
5. an audio broadcast distributed over the Internet.

Writing. Write a short article (80-120 words) for your school/university/work, newsletter about the latest internet phenomena (My Space, eBay, etc.). Talk about any other sites you think are important or will be important in the future.

Questions for Self Control

1. What blog software, peer-to-peer networks, open-source software, and wikis are there in the cyberspace?

Самостійна робота № 3

Theme What is a Computer?

Task 1. In pairs, discuss these questions.

1. Have you got a computer at home, school or work? What kind is it?
2. How often do you use it? What do you use it for?
3. What are the main components and features of your computer system?

Task 2. In pairs, label the elements of this computer system.



Reading. “What is a Computer?”

A computer is an electronic machine which can accept data in a certain form, process the data, and give the results of the processing in a specified format as information. First, data is fed into the computer's memory. Then, when the program is run, the computer performs a set of instructions and processes the data. Finally, we can see the results (the output) on the screen or in printed form.

A computer system consists of two parts: hardware and software. **Hardware** is any electronic or mechanical part you can see or touch. **Software** is a set of instructions, called a program, which tells the computer what to do. There are three

basic hardware sections: the central processing unit (**CPU**), main memory and **peripherals**.

Perhaps the most influential component is the central processing unit. Its function is to execute program instructions and coordinate the activities of all the other units. In a way, it is the “brain” of the computer. The main memory (a collection of RAM chips) holds the instructions and data which are being processed by the CPU. Peripherals are the physical units attached to the computer. They include storage devices and input/ output devices.

Storage devices (hard drives, DVD drives or flash drives) provide a permanent storage of both data and programs. **Disk drives** are used to read and write data on disks. Input devices enable data to go into the computer's memory. The most common input devices are the **mouse** and the **keyboard**. **Output devices** enable us to extract the finished product from the system. For example, the computer shows the output on the **monitor** or prints the results onto paper by means of a **printer**.

On the rear panel of the computer there are several **ports** into which we can plug a wide range of peripherals - a modem, a digital camera, a scanner, etc. They allow communication between the computer and the devices. Modern desktop PCs have USB ports and memory card readers on the front panel.

Task 3. Match these words from the text (1-9) with the correct meaning (a-i).

1. Software
2. peripherals
3. main memory
4. hard drive (also known as hard disk)
5. hardware
6. input
7. ports
8. output
9. central processing unit (CPU)

- a) the brain of the computer
- b) physical parts that make up a computer system
- c) programs which can be used on a particular computer system
- d) the information which is presented to the computer
- e) results produced by a computer
- f) input devices attached to the CPU
- g) section that holds programs and data while they are executed or processed
- h) magnetic device used to store information
- i) sockets into which an external device may be connected

Writing. Write an e-mail explaining the benefits of tablet PC

Questions for Self Control

1. Explain the advantages of a laptop over PC.

Самостійна робота № 4

Theme Internet FAQs (Part I)

Task 1. Read Part 1 of the Internet FAQs and choose the correct answers.

1. The Internet was
a) invented in the mid-90s. b) popular in the 1960s. c) probably created in the USA.
2. Which term describes any fast, high-bandwidth connection?
a) broadband b) dial-up connection c) Wi-Fi connection
3. The power-line Internet provides broadband access through
a) telephone lines b) satellites c) electrical power lines
4. Which device converts computer data into a form that can be transmitted over phone lines?
a) ADSL b) a mobile phone c) a modem
5. The standard protocol that allows computers to communicate over the Internet is called.....
a) an IP address b) TCP/IP c) HTTP
6. The geographical region covered by one or several access points is called a
a) wireless access point b) hotspot c) wireless network device

Reading. Internet FAQs: Part I

How old is the Internet (the Net)? When was it created? It's hard to say exactly. The research that led to what we now know as the Internet was begun in the 1960s.

Who created the Internet? Again, it's hard to say exactly who created it. The initial research was carried out by the Advanced Research Projects Agency in America, funded by the US government.

Did the Internet become popular quickly? It took many years for the Internet to become popular around the world. It's only really since the mid-90s that the Internet has been a part of our daily lives.

How do you get online? To get connected, you need a computer, the right connection software and a modem connected to the phone line. You also need an account with an Internet Service Provider (ISP), which acts as a gateway between your PC and the rest of the Net.

How fast are today's internet connections? Today, ISPs offer a broadband, high speed connection. The most common types are cable - offered by local cable TV companies - and ADSL (Asymmetric Digital Subscriber Line), which works through phone lines. They are both faster than the traditional dial-up telephone connection. Broadband access is also offered by some electricity networks. This competing technology, known as power-line Internet, provides low-cost access via the power plug, but is still in development.

How long has broadband existed? Since the late 1990s.

How much does broadband access cost? It depends on which company you choose. Nowadays, some companies even offer free broadband.

Why do you need a modem? A modem (modulator/demodulator) converts digital signals into analogue signals so that data can be transmitted across the phone or cable network.

What does TCP/IP mean? The language used for data transfer on the Internet is known as TCP/IP (transmission control protocol/ Internet protocol). This is like the internet operating system. Every computer connected to the Net is identified by a unique IP address.

Are there other ways of accessing the Internet? Other methods of internet access include Wi-Fi, satellite, mobile phones and TV sets equipped with a modem. Wi-Fi enabled laptops or PDAs allow you to connect to the Net if you are near a wireless access point, in locations called hotspots (for example, a Wi-Fi cafe, park or campus).

Satellite services are used in places where terrestrial access is not available (for example, on ships at sea). High-end mobile phones provide access through the phone network.

Task 2. In pairs, discuss which of the internet systems (1-6) you would use to do the tasks (a-f). Then read Part 2 of the FAQs and check your answers.

- | | |
|----------------|---|
| 1. Email | a) transfer files from the Internet to your hard drive |
| 2. The Web | b) send a message to another person via the Internet |
| 3. Newsgroup | c) have a live conversation (usually typed) online |
| 4. Chat and IM | d) connect to a remote computer by entering instructions, and run a program on it |
| 5. FTP | e) take part in public discussion areas devoted to specific topics |
| 6. Telnet | f) download and view documents published on the Internet |

Writing. Write a short composition “Internet Facts”

Questions for Self Control

1. What is the full meaning of FAQs?
2. What are FAQs about Internet?

Самостійна робота № 5

Theme Internet FAQs (Part II)

Reading. Internet FAQs: Part II

Email

Email lets you exchange messages with people all over the world. Optional attached files can include text, pictures and even audio and animation. A mailing list uses email to communicate messages to all its subscribers - that is, everyone that belongs to the list.

Which email program is the best?

Outlook Express is a popular program, but many users use web-based email accounts such as Hotmail.

The Web

The Web consists of billions of documents living on web servers that use the HTTP protocol. You navigate through the Web using a program called a web browser, which lets you search, view and print web pages.

How often are web pages updated?

It depends entirely on the page. Some are updated thousands of times a day.

Chat and Instant Messaging (IM)

Chat and Instant Messaging technologies allow you to have real-time conversations online, by typing messages at the keyboard.

FTP

FTP, or file transfer protocol, is used to transfer files over a TCP/IP network. Nowadays, this feature is built into Web browsers. You can download programs, games and music files from a remote computer to your hard drive.

Telnet

Telnet is a protocol and a program used to log onto remote computer systems. It enables you to enter commands that will be executed as if you were entering them directly on the remote server.

Newsgroups

Newsgroups are the public discussion areas which make up a system called Usenet. The contents are contributed by people who post articles or respond to articles, creating chains of related postings called message threads. You need a newsreader to subscribe to newsgroups and to read and post messages. The newsreader may be a stand-alone program or part of a web browser.

How many newsgroups are there?

There are approximately 30,000 active newsgroups.

Where can you find newsgroups?

Your newsreader may allow you to download the newsgroup addresses that your ISP has included on its news server. An alternative to using a newsreader is to visit web forums instead, which perform the same function but without the additional software.

Task 1. Find words and phrases in Part 2 with the following meanings.

1. a system used to distribute email to many different subscribers at once (in Email paragraph);
2. a program used for displaying web pages (in The Web paragraph);
3. to connect to a computer by typing your username and password (in Telnet paragraph);
4. a series of interrelated messages on a given topic (in Newsgroups paragraph);
5. a program for reading Usenet newsgroups (in Newsgroups paragraph).

Writing. Write an email

Questions for Self Control

1. What are the advantages of the Web?

Самостійна робота № 6

Theme *The Keyboard. Mouse Actions*

Task 1. Label the picture of a standard keyboard with the groups of keys (1-5).

1. **Cursor control keys** include arrow keys that move the insertion point up, down, right and left, and keys such as *End*, *Home*, *Page Up* and *Page Down*, which are used in word processing to move around a long document.
2. **Alphanumeric keys** represent letters and numbers, as arranged on a typewriter.
3. **Function keys** appear at the top of the keyboard and can be programmed to do special tasks.
4. **Dedicated keys** are used to issue commands or to produce alternative characters, e.g. the *Ctrl* key or the *Alt* key.
5. **A numeric keypad** appears to the right of the main keyboard. The *NumLock* key is used to switch from numbers to editing keys.

Task 2. Match the descriptions (1-8) with the names of the keys (a-h). Then find them on the keyboard.

1. A long key at the bottom of the keyboard. Each time it is pressed, it produces a blank space.
 2. It moves the cursor to the beginning of a new line. It is also used to confirm commands.
 3. It works in combination with other keys. For example, you press this key and C to copy the selected text.
 4. It removes the character to the left of the cursor or any selected text.
 5. It produces UPPER CASE characters.
 6. It produces UPPER CASE letters, but it does not affect numbers and symbols.
 7. It moves the cursor horizontally to the right for a fixed number of spaces (in tabulations and data fields).
 1. They are used to move the cursor, as an alternative to the mouse.
-
- a. Arrow keys
 - b. Return/enter
 - c. Caps lock
 - d. Shift
 - e. Tab
 - f. Space bar
 - g. Backspace
 - h. Ctrl

Mouse Actions

Task 3. Complete this text with the verbs from the box

click	double-click	drag	grab	select	move	control
-------	--------------	------	------	--------	------	---------

Reading. Mouse Actions

A mouse allows you to (1) the cursor and move around the screen very quickly. Making the same movements with the arrow keys on the keyboard would take much longer. As you (2) the mouse on your desk, the pointer on the screen moves in the same direction. The pointer usually looks like an I-bar, an arrow, or a pointing hand, depending on what you are doing. A mouse has one or more buttons to communicate with the computer. For example, if you want to place the insertion point or choose a menu option, you just (3) (press and release) on the mouse button, and the option is chosen.

The mouse is also used to (4) text and items on the screen. You can highlight text to be deleted, copied or edited in some way. The mouse is widely used in graphics and design. When you want to move an image, you position the pointer on the object you want to move, press the mouse button, and (5) the image to a new location on the screen. Similarly, the mouse is used to change the shape of a graphic object. For example, if you want to convert a square into a rectangle, you (6) one corner of the square and stretch it into a rectangle.

The mouse is also used to start a program or open a document: you put the pointer on the file name and (7) on the name - that is, you rapidly press and release the mouse button twice.

Writing. Describe in short functions and features of the mouse and the keyboard.

Questions for Self Control

1. What are the main input devices?

Самостійна робота № 7

Theme *The Eyes of your Computer*

Task 1. Discuss how many ways there are of capturing an image on a computer.

Task 2. Read the text and see how many things from your list are mentioned.

Task 3. Read the text again and answer these questions.

1. Which device is used to input text and graphic images from a printed page?
2. How does a scanner send information to the computer?
3. How do digital cameras store photographs?
4. What feature allows mobile phone users to take pictures?
5. Which device would you use to take digital video?
6. What kind of software is used to manipulate video clips on the computer?

Reading. The Eyes of your Computer

What does a scanner do?

A scanner 'sees' images and converts the printed text or pictures into electronic codes that can be understood by the computer. With a flatbed colour scanner, the paper with the image is placed face down on a glass screen, as with a photocopier. Beneath the glass are the lighting and measurement devices. Once the scanner is activated, it reads the image as a series of dots and then generates the digitized image that is sent to the computer and stored as a file.

The scanner operates by using three rotating lamps, each of which has a different coloured filter: red, green and blue. The resulting three separate images are combined into one by appropriate software.



What does a digital camera do?

A digital camera takes photos electronically and converts them into digital data (binary codes made up of 1s and 0s). It doesn't use the film found in a traditional camera; instead it has a special light-sensitive silicon chip.

Photographs are stored in the camera's memory card before being sent to the computer. Some cameras can also be connected to a printer or a TV set to make viewing images easier. This is usually the case with camera phones - mobile phones with a built-in camera.



What does a camcorder do?

A camcorder, or digital video camera, records moving pictures and converts them into digital data that can be stored and edited by a computer with special video editing software.

Digital video cameras are used by home users to create their own movies, or by professionals in computer art and video conferencing. They are also used to send live video images via the Internet. In this case they are called web cameras, or webcams.

Writing. Write a short essay on the questions, proposed for discussion (Task 1,3).

Questions for Self Control

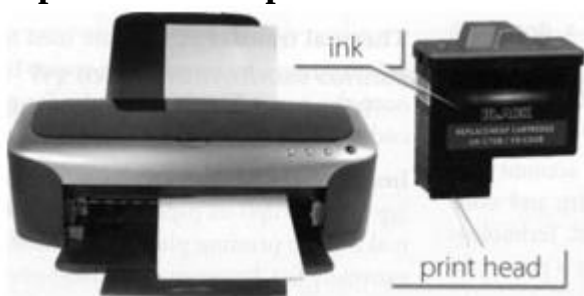
1. What devices do you use to capture images?

Самостійна робота № 8

Theme *Types of Printer*

Task 1. How many types of printer can you think of? Make a list.

Task 2. Read the article and then label the types of printer (1-5). Which types of printer aren't pictured?



1. The quality (resolution) of the images goes up to 2,400 dots per inch (dpi) ...



2. Provides high quality output: a resolution of 1,200-2,400 dpi.....

3. The resolution depends on the number of pins.....



4. Provides high quality for line work and curves).....



5. Provides the highest resolution: (lines more than 3,000 dpi).....

Reading. Which Type of Printer should I Buy?

Printing is the final stage in creating a document. Since the results you can obtain with different types of printer will vary substantially, here is a guide to help you decide which one is most suitable for your needs.

To begin with, you should take into account that printers vary in cost, speed, print quality, and other factors such as noise or printing method. Technology is evolving so quickly that there is always a printer for every application or need.

Dot-matrix printers use pins to print the dots required to shape a character. They can print text and graphics; however, they produce relatively low resolution output - 72 to 180 dots per inch (dpi). They are used to print multi-part forms, self copying paper and continuous-form labels. They are slower than laser printers (see below) but much cheaper.

Inkjet printers operate by projecting small ink droplets onto paper to form the required image. Colour and hues are created by the precise mixing of cyan, magenta, yellow and black inks. Inkjets are fairly fast, quiet, and not as expensive as laser printers. Nevertheless, you can still expect high quality results because there are some inkjet printers on the market with a resolution of 2,400 dpi.

Laser printers produce output at great speed and with a very high resolution of 1,200-2,400 dpi. They scan the image with a laser beam and transfer it to paper with a special ink powder called toner. They are constantly being improved. In terms of speed and image quality, laser printers are preferred by experts for various reasons; for instance, they have a wider range of scalable fonts than inkjets, can emulate different language systems, and can produce high-quality graphics; however, they are still expensive for home users.

Thermal transfer printers are used to produce colour images by transferring a wax-based ink onto the paper. They are popular for printing bar codes, labels and medium-resolution graphics.

Image setters produce very high-resolution output (up to 3,540 dpi) on paper or on the actual film for making the printing plates. In addition, they are extremely fast.

Image setters are most often used in desktop publishing (DTP). Although they produce the highest quality output, they have one important disadvantage: they are too expensive for homes or small offices.

In modern lithographic printing, images are created on a DTP computer and then output directly to the printing plates, without requiring film as an intermediate step. This technology is called **computer to plate**, or **CTP**, and the machine used is called a **plate setter**. Finally, we have **plotters**. Plotters use ink and fine pens held in a carriage to draw very detailed designs on paper. They are used for construction plans, engineering drawings and other technical illustrations. Nowadays, traditional plotters are being replaced with wide-format inkjets.

Task 3. Find words in the article with the following meanings.

1. designs and images used in magazines, books, etc.;
2. output quality, measured in dots per inch;
3. a particular colour within the colour spectrum;
4. an ink powder used in laser printers and copiers;
5. set of characters that can be resized without introducing distortion;
6. a rectangular pattern of black lines of magnetic ink printed on an object so that its details can be read by a computer system;

7. surface that carries a reproduction of the image, from which the pages are printed;
8. in-between; middle.

Writing. Describe the features of your ideal printer.

Questions for Self Control

1. What technologies are used in modern printers?

Самостійна робота № 9

Theme Your Computer Screen

Task 1. In pairs, discuss these questions.

1. What type of display do you have: a cathode ray tube or an LCD flat screen?
2. What size is the screen?
3. How can you change the picture using the controls?
4. Can you watch on your PC monitor?

How screen displays work?

Task 2. Complete these definitions with words from the box. Then read the text and check your answer.

Resolution pixel aspect ratio colour depth video adapter plasma screen

- 1 - an expansion card that generates the video signal sent to a computer display;
- 2 - the width of the screen in proportion to its height;
- 3 - also called gas discharge display;
- 4 - the number of pixels contained in a display, horizontally and vertically;
- 5 - the number of bits used to hold a colour pixel; this determines the maximum number of colours that can be displayed;
- 6 - the smallest unit on a display screen or bitmapped image.

Task 3. Read the text again and answer these questions

1. What do CRT and LCD stand for?
2. How is the screen size measured?
3. What technology is used by active-matrix LCDs?
4. Which unit of frequency is used to measure the brightness of a display?
5. What substance produces light and colour when hit by electrons in a CRT monitor?
6. What are the three advantages of OLED displays?

Reading. How Screen Displays Work

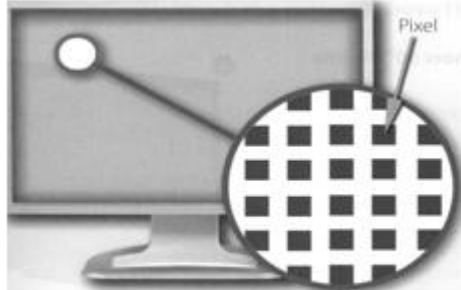
Displays, often called **monitors** or **screens**, are the most-used output device on a computer. They provide instant feedback by showing you text and graphic images as you work or play.

Most desktop displays use **Liquid Crystal Display (LCD)** or **Cathode Ray Tube (CRT)** technology, while nearly all portable computing devices, such as laptops, incorporate LCDs. Because of their slimmer design and lower energy

consumption, LCD monitors (also called **flat panel** or **flat screen** displays) are replacing CRTs.

Basic features

Resolution refers to the number of dots of colour, known as **pixels** (picture elements), contained in a display. It is expressed by identifying the number of pixels on the horizontal and vertical axes. A typical resolution is 1024x768.



A pixel is a combination of red, green and blue subpixels

Two measurements describe the size of your display: the **aspect ratio** and the **screen size**. Historically, computer displays, like most televisions, have had an aspect ratio of 4:3 - the width of the screen to the height is four to three. For widescreen LCD displays, the aspect ratio is 16:9, very useful for viewing DVD movies, playing games and displaying multiple windows side by side. High-definition TV also uses this format. The viewable screen size is measured diagonally, so a 19"screen measures 19" from the top left to the bottom right.

Inside the computer there is a **video adapter**, or graphics card, which processes images and sends signals to the monitor. CRT monitors use a **VGA (video graphics adapter)** cable, which converts digital signals into analogue signals. LCD monitors use a **DVI (digital video interface)** connection.

Colour depth refers to the number of colours a monitor can display. This depends on the number of bits used to describe the colour of a single pixel. For example, an old VGA monitor with an 8-bit depth can generate 256 colours and a SuperVGA with a 24-bit depth can generate 16.7 million colours. Monitors with a 32-bit depth are used in digital video, animation and video games to get certain effects.

Display technologies

An **LCD** is made of two glass plates with a liquid crystal material between them. The crystals block the light in different quantities to create the image. **Active-matrix LCDs** use **TFT (thin film transistor)** technology, in which each pixel has its own switch. The amount of light the LCD monitor produces is called brightness or luminance, measured in cd/m^2 (candela per square metre).

A **CRT** monitor is similar to a traditional TV set. It contains millions of tiny red, green and blue phosphor dots that glow when struck by an electron beam that travels across the screen and create a visible image.

PCs can be connected to **video projectors**, which project the image onto a large screen. They are used for presentations and home theatre applications.

In a **plasma screen**, images are created by a plasma discharge which contains noble (non-harmful) gases. Plasma TVs allow for larger screens and wide viewing angles, making them ideal for movies.

Organic Light-Emitting Diodes (OLEDs) are thin-film LED displays that don't require a backlight to function. The material emits light when stimulated by an electrical current, which is known as electroluminescence. They consume less energy, produce brighter colours and are flexible - i.e. they can be bent and rolled up when they're not being used.

Writing. Which of the display devices you would most like to own? Give reasons for your choice.

Questions for Self Control

1. What types of screen do you know?

Самостійна робота № 10

Theme What is inside a PC System ?

Task 1. Read the text and then answer these questions.

1. What are the main parts of the CPU?
2. What does ALU stand for? What does it do?
3. What is the function of the system clock?
4. How much is one gigahertz?
5. What type of memory is temporary?
6. What type of memory is permanent and includes instructions needed by the CPU?
7. How can RAM be increased?
8. What term is used to refer to the main printed circuit board?
9. What is a bus?
10. What is the benefit of having expansion slots?

Task 2. Look at these extracts from the text. What do the words in bold refer to?

1. This is built into a single chip.
2. ... which executes program instructions and coordinates...
3. ... that is being executed.
4. ... performance of a computer is partly determined by the speed of its processor.
5. ... the CPU looks for it on the hard disk ...
6. ... inside the computer to communicate with each other.

Reading. What is inside a PC System?

Processing

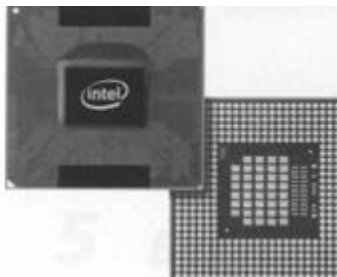
The nerve centre of a PC is the **processor**, also called the CPU, or **central processing unit**. This is built into a single chip which executes program instructions and coordinates the activities that take place within the computer

system. The chip itself is a small piece of silicon with a complex electrical circuit called an **integrated circuit**.

The processor consists of three main parts:

- The **control unit** examines the instructions in the user's program, interprets each instruction and causes the circuits and the rest of the components - monitor, disk drives, etc. - to execute the functions specified.
- The **arithmetic logic unit (ALU)** performs mathematical calculations (+,-) and logical operations (AND, OR, NOT).
- The **registers** are high-speed units of memory used to store and control data. One of the registers (the program counter, or PC) keeps track of the next instruction to be performed in the main memory. The other (the instruction register, or IR) holds the instruction that is being executed.

The power and performance of a computer is partly determined by the speed of its processor. A **system clock** sends out signals at fixed intervals to measure and synchronize the flow of data. **Clock speed** is measured in **gigahertz (GHz)**. For example, a CPU running at 4GHz (four thousand million hertz, or 30 cycles, per second) will enable your PC to handle the most demanding applications.

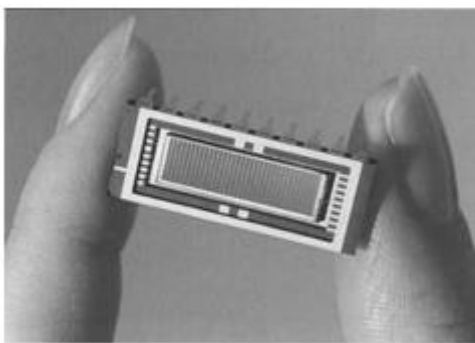


The Intel Core 2 Duo processor; other chip manufacturers are AMD and Motorola

RAM and ROM

The programs and data which pass through the processor must be loaded into the main memory in order to be processed. Therefore, when the user runs a program, the CPU looks for it on the hard disk and transfers a copy into the **RAM** chips. RAM (**random access memory**) is volatile - that is, its information is lost when the computer is turned off. However, **ROM (read only memory)** is non-volatile, containing 40 instructions and routines for the basic operations of the CPU. The **BIOS (basic input/output system)** uses ROM to control communication with peripherals.

RAM capacity can be expanded by adding extra chips, usually contained in small circuit boards called dual in-line memory modules (**DIMMs**).



ARA

Buses and cards

The main circuit board inside your system is called the **motherboard** and contains the processor, the memory chips, expansion slots, and controllers for peripherals, connected by **buses** - electrical channels which allow devices inside the computer to communicate with each other. For example, the front side bus carries all data that passes from the CPU to other devices.

The size of a bus, called **bus width**, determines how much data can be transmitted. It can be compared to the number of lanes on a motorway - the larger the width, the more data can travel along the bus. For example, a 64-bit bus can transmit 64 bits of data.



a data bus

Expansion slots allow users to install expansion cards, adding features like sound, memory and network capabilities.

Writing. Summarize the text.

Questions for Self Control

1. What is inside the PC system?

Самостійна робота № 11

Theme Bits and Bytes

Task 1. Read the text and then answer these questions.

1. How many digits does a binary system use?
2. What is a b/t?
3. What is a collection of eight bits called?
4. What does ASCII stand for?
5. What is the purpose of ASCII?

Reading. Bits and Bytes

Computers do all calculations using a code made of just two numbers 0 and 1. This system is called **binary code**. The electronic circuits in a digital computer detect the difference between two states: ON (the current passes through) or OFF (the current doesn't pass through) and represent these states as 1 or 0. Each 1 or 0 is called a **binary digit**, or **bit**.

Bits are grouped into eight-digit codes that typically represent characters

(letters, numbers and symbols). Eight bits together are called a **byte**. Thus, each character on a keyboard has its own arrangement of eight bits. For example, 01000001 for the letter A, 01000010 for B, and 01000011 for C.

Computers use a standard code for the binary representation of characters. This is the American Standard Code for Information Interchange, or **ASCII** - pronounced /'asski/. In order to avoid complex calculations of bytes, we use bigger units such as kilobytes, megabytes and gigabytes.

We use these units to describe the RAM memory, the storage capacity of disks and the size of a program or document.

Note: **bit** is pronounced /bit/; **byte** is pronounced /bait/

Task 2. Complete these descriptions with the correct unit of memory

1. A... is about one trillion bytes - about as much text as the books and magazines in a huge library.
2. A... is about one million bytes - about as much text as a 300-page novel.
3. A... is about one thousand bytes - equivalent to one sheet of A4.
4. A... is about one billion bytes – about as much text as 1 000 books.
5. A... can store a single character, such as the letter H or number 7.

Writing. Discuss the questions in writing (Task 1).

Questions for Self Control

1. What units of memory do you know?

Самостійна робота № 12

Theme *Magnetic Storage*

Task 1. Read the text and then identify a sector and a track in Fig. 1

Reading. Magnetic Storage

Magnetic storage devices store by magnetizing particles on a disk or tape. A **floppy disk** is so called because it consists of a flexible sheet of plastic, coated with iron oxide - a magnetizable material. A floppy disk drive spins at 360 revolutions per minute (rpm), so it's relatively slow. However, a hard drive spins at over 7,200 rpm and stores data on a stack of metal rotating disks called platters. This means you can store much more data and retrieve information much faster.

New disks need to be **formatted** before you can use them, unless they come preformatted from the manufacturer. When the disk is formatted, the operating system (OS) organizes the disk surface into circular tracks and divides each **track** into **sectors**. The OS creates a **directory** which will record the specific location of files. When you save a file, the OS moves the **read/write head** of the drive towards empty sectors, records the data and writes an entry for the directory. Later on, when you open that file, the OS looks for its entry in the directory, moves the read/write heads to the correct sector, and reads the file in the RAM area.

However, formatting erases any existing files on a disk, so do not format disks on which data that you don't want to lose is stored.

The OS allows you to create one or more **partitions** on your hard drive, in effect dividing it into several logical parts. Partitions let you install more than one operating system (e.g. Windows and Linux) on your computer. You may also decide to split your hard drive because you want to store the OS and programs on one partition and your data files on another; this allows you to reinstall the OS when a problem occurs, without affecting the data partition.



The inside of a hard

The average time required for the read/ write heads to move and find data is called **seek time** (or **access time**) and it is measured in milliseconds (ms); most hard drives have a seek time of 7 to 14 ms. Don't confuse this with **transfer rate** - the average speed required to transmit data from the disk to the CPU, measured in megabytes per second.

How to protect your hard drive

- Don't hit or move the computer while the hard drive is spinning. Hard drives are very sensitive to vibration and shocks, especially when they are operating; when the read/write head touches the rotating disk, it can scratch and damage the disk surface. This is known as head crash
- You shouldn't turn your computer off and on quickly. Wait at least ten seconds to ensure that the drive has stopped spinning.
- Check your hard drive regularly for logical and physical errors. To check and repair a drive, you can use a disk diagnosis utility like Windows ScanDisk.
- To minimize the risk of data loss or corruption, you should install an up-to-date virus scanner. You should also back up your hard drive regularly.

Task 2. Match these words (1 -5) with the definitions (a-e).

- | | |
|--------------------|---|
| 1. formatted | a) a file system that defines the structure for keeping track of the files |
| 2. directory | b) the part of a drive that reads and records data on a disk |
| 3. read/write head | c) to make a copy of data or software in case the original disk is damaged |
| 4. head crash | d) initialized; when the tracks and sectors on magnetic disks are set |
| 5. back up | e) a serious disk malfunction; when the read/write head touches the rotating disk |

Writing. Explain the principle of hard drive operation.

Questions for Self Control

1. What technologies are used in storage devices?

Самостійна робота № 13

Theme Optical Discs and Drives

Task 1. Read the text and find the following.

1. the advantages and disadvantages of optical discs over magnetic disks;
2. the storage capacity of a double-sided, dual layer DVD;
3. the difference between a DVD burner and a DVD recorder;
- 4 the feature of a portable DVD player which allows the user to play different Formats;
5. two possible successors to DVDs;
6. where the Blu-ray format gets its name from;

Reading. Optical Discs and Drives

Optical discs can store data at much higher densities than magnetic disks. They are therefore ideal for multimedia applications where images, animation and sound occupy a lot of disc space. Furthermore, optical discs are not affected by magnetic fields, meaning that they are secure and stable, and can be transported through airport metal detectors without damaging the data. However, optical drives are slower than hard drives.

CDs and DVDs. At first sight, a DVD is similar to a CD. Both discs are 120 mm in diameter and 1.2 mm thick. They also both use a laser beam to read data. However, they are very different in internal structure and data capacity. In a DVD, the tracks are very close together, thus allowing more tracks. The pits in which data is stored are also smaller, so there are more pits per track. As a result, a CD can hold 650-700MB, whereas a basic DVD can hold 4.7GB. In addition, a DVD can be double-sided and dual layer, with a capacity of 17GB.

CDs come in three different formats:

- CD-ROMs (read-only memory) are read-only units, meaning you cannot change the data stored on them (for example, a dictionary or a game).
- CD-R (recordable) discs are write-once devices which let you duplicate music CDs and other data CDs.
- CD-RW (rewritable) discs enable you to write onto them many times, just like a hard disk.

DVDs also come in several formats:

- DVD-ROMs are used in DVD computer drives. They allow for data archiving as well as interactive content (for example, an encyclopedia or a movie).
- DVD-R or DVD+R can only be recorded on once.
- DVD-RW or DVD+RW discs can be erased and reused many times. They are used to back up data files and to record audio and video.

The DVD drive used in computers is also called a DVD burner because it records information by burning via a laser to a blank DVD disc. However, a DVD recorder typically refers to a standalone unit which resembles a video cassette recorder. New DVD recorders can play all CD and DVD formats. There are also portable DVD players - handheld devices which let you watch movies or TV, play games and listen to music, wherever you are. They come with a built -in DVD drive and widescreen (rectangular 16:9 format) LCD display. They usually support

multi-format playback -that is, they can play many file formats, including DVD-video, DivX, CD audio discs, MP3 music and JPEG images.

HD-DVD and Blu-ray discs. These two competing formats are expected to replace current DVD as the standard for watching movies at home. On one side are Toshiba, Microsoft and the DVD Forum, who support the High Definition-DVD (HD-DVD). Sony, Panasonic, Samsung, JVC and many movie studios are behind the Blu-ray format.

A Blu-ray disc has a capacity of 25GB (single layer), 50GB (dual layer) and 100GB (four layer). Unlike DVDs, which use a red laser to read and write data, Blu-ray uses a blue-violet laser, hence its name. Blu-ray discs can record and play back high definition television and digital audio, as well as computer data.

Task 2. Read the text again and make notes about the features of CDs, DVDs and Blu-ray discs.

	Capacity and formats	Possible uses
CD		
DVD		
Blu-ray		

Writing. Write an essay on one of the points in Task 1

Questions for Self Control

1. Describe the basis of operation of optical storage devices.

Самостійна робота № 14

Theme *Memory in a Flash!*

Task 1. Read the title of the next page. Why is it a suitable title for an article?

Read the 1st paragraph and find out.

Task 2. Read the whole text and answer these questions.

1. What is flash memory?
2. What are the differences between RAM memory and flash memory?
3. What can devices which use multi-level cell technology do?
4. What are the differences between flash drives and external hard drives?
5. What is the advantage of using U3 technology in flash drives?
6. How much data can a flash memory card hold?
7. What is the name of the flash card created by Sony for its digital cameras?

Reading. Memory in a Flash

Flash memory is a type of non-volatile memory that can be electronically erased and reprogrammed. Its name was invented by Toshiba to express how much faster it could be erased -'in a flash', which means 'very quickly'.

Unlike RAM, which is **volatile**, flash memory retains the information stored in the chip when the power is turned off. This makes it ideal for use in digital cameras, laptops, network switches, video game, cards, mobile phones and portable multimedia players. In addition, it offers fast read access times (although not as fast as RAM), with transfer rates of 12MB per second. Unlike ROM chips, flash memory chips are rewritable, so you can update programs via software.

Inside the chip, data is stored in several floating gate transistors, called **cells**. Each cell traditionally stores one bit of data (1 = erased and 0 = programmed). New devices have a multi-level cell structure so they can store more than one bit per cell.

The chips are constructed with either **NOR** or **NAND** gates. NOR chips function like a computer's main memory, while NAND works like a hard drive. For example, in a camera, NOR flash contains the camera's internal software, while NAND flash is used to store the images. Flash memory is used in several ways:

- Many PCs have their BIOS (basic input/output system) stored on a flash memory chip so it can be updated if necessary.

- Modems use flash memory because it allows the manufacturer to support new protocols.

- **USB flash drives** are used to save and move MP3s and other data files between computers. They are more easily transported than external hard drives because they use solid state technology, meaning that they don't have fragile moving parts that can break if dropped. However, USB flash drives have less storage capacity than hard drives.

- New **U3 smart drives** allow users to store both applications and data. They have two drive partitions and can carry applications that run on the host computer without requiring installation.

- **Flash memory cards** are used to store images on cameras, to backup data on PDAs, to transfer games in video consoles, to record voice and music on MP3 players or to store movies on MP4 players. They are as small as a stamp, and capacity can range from 8MB to several gigabytes. The only limitation is that flash cards are often not interchangeable between devices. Some formats include: CompactFlash, Secure Digital, MultiMedia Card, miniSD card, and xD-Picture Card.

Sony has its own product called the Memory Stick, used in its digital still cameras, video camcorders and the PlayStation Portable. The photos stored in a digital camera can be offloaded to a computer via cable or wirelessly. Another option is to have a **flash card reader** permanently connected to your PC; you simply eject the card from the camera and put it into the reader instead of having to plug the camera in.

The future of hard drives may be **hybrid hard drives** combine a magnetic device. This allows computers to boot, or start, more quickly, and also reduces power consumption.

Task 3. Find words or phrases in the text with the following meanings.

1. permanent; able to hold data without power;

2. able to be rewritten many times ;
3. different sections of a disk drive or storage area;
4. to make a copy of a file so that the original is not lost;
5. transferred to another device a peripheral device that reads and writes flash memory cards;
6. a product that integrates two different technologies.

Writing. Describe a flash-based device.

Questions for Self Control

1. What storage devices do you use?

Самостійна робота № 15

Theme *GUI Operating Systems.*

Task 1. In pairs, discuss these questions.

1. What does user-friendly mean?
2. Do you think most operating systems are user-friendly? Give reasons.

Task 2. Read the text and decide which adjectives in the box best describe a GUI.

user-friendly slow accessible text-based intuitive complex
graphics-based

Task 3. Read the text again and answer these questions.

1. What kind of OS was used in the early 80s: text-based or graphics-based?
2. What is the contribution of Macintosh computers to the development of graphic environments?
3. What does the acronym WIMP stand for?
4. How do you run a program on a computer with a graphical interface?
5. What is multitasking?
6. Which multi-user OS is used on large, powerful computers?
7. What is the benefit of using open-source software, for example Linux?
8. Which Microsoft platform is used for pocket PCs, mobiles and portable media centres?

Reading. GUI Operating System

The term **user interface** refers to the standard procedures that the user follows in order to interact with a computer. In the late 1970s and early 80s, the way users accessed computer systems was very complex. They had to memorize and type a lot of commands just to see the contents of a disk, to copy files or to respond to a single prompt. In fact, it was only experts who used computers, so there was no need for a user-friendly interface.

In 1984, Apple produced the Macintosh, the first computer with a mouse and a

graphical user interface (GUI). Macs were designed with one clear aim: to facilitate interaction with the computer. A few years later, Microsoft launched Windows, another operating system based on graphics and intuitive tools.

Nowadays, computers are used by all kinds of people, and as a result there is a growing emphasis on accessibility and user-friendly systems.

A GUI makes use of a **WIMP** environment: **w**indows, **i**cons, **m**enus and **p**ointer. The background of the screen is called the **desktop**, which contains labelled pictures called **icons**. These icons represent **files** or **folders**. Double-clicking a folder opens a window which contains **programs**, **documents**, or more nested folders. When you are in a folder, you can launch a program or document by double-clicking the icon, or you can drag it to another location. When you run a program, your PC opens a window that lets you work with different tools. All the programs have a high level of consistency, with similar toolbars, menu bars, buttons and dialog boxes. A modern OS also provides access to networks and allows multitasking, which means you can run several programs - and do various tasks - at the same time.

The most popular operating systems are:

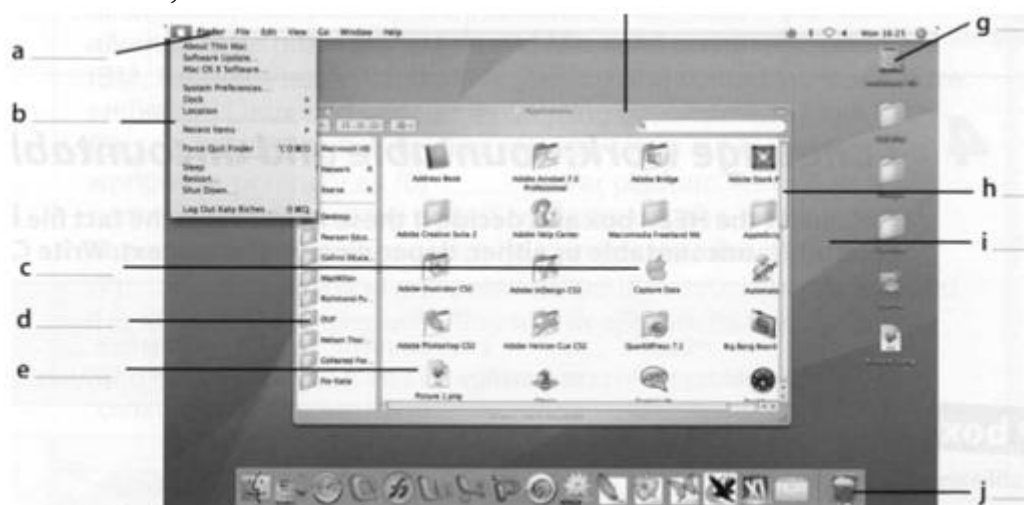
- The **Windows** family - designed by Microsoft and used on most PCs. The most recent version is Windows Vista.
- **Mac OS** - created by Apple and used on Macintosh computers.
- **Unix** - a multi-user system, found on mainframes and workstations in corporate installations.
- **Linux** - open-source software developed under the GNU General Public License. This means anybody can copy its source code, change it and distribute it. It is used in computers, appliances and small devices.
- **Windows Mobile** - used on most PDAs and smartphones (PDAs incorporating mobile phones).
- **Palm OS** - used on Palm handheld devices.
- **RIM** - used on BlackBerry communication devices. Developed by Research In Motion.
- The **Symbian OS** - used by some phone makers, including Nokia and Siemens. These computer platforms differ in areas such as device installation, network connectivity or compatibility with application software.

Task 4. Translate these terms and expressions into your own language. Use a dictionary or the Internet to help you.

1. user interface
2. procedures
3. commands
4. tools
5. desktop
6. nested folders
7. launch a program
8. source code

Task 5. Label the interface features (a-j) on the Screenshot of Apple's Mac OS X operating system with words in bold from this list.

- **desktop**: the background screen that displays icons and folders;
- **window**: a scrollable viewing area on screen; it can contain files or folders;
- **icon**: a picture representing an object; for example, a document, program, folder or hard drive icon;
- **folder**: a directory that holds data, programs and other folders;
- **menu bar**: a row of words that open up menus when selected;
- **drop-down (pull-down) menu**: a list of options that appears below a menu item when selected;
- **scroll bar**: a horizontal or vertical bar that is clicked and dragged in the desired direction;
- **dock**: set of icons at the bottom of the screen that give you access to the things you use most;



Task 6. Compare the Mac OS X user interface with a Windows or Linux interface.

What are the similarities and differences? Which features do you prefer from each interface?

Writing. Summarize the text GUI Operating System.

Questions for Self Control

1. What operation system do you use in your computer?

Самостійна робота № 16

Theme WP Tools

Reading.

1. Spell checkers can be used to compare words in the program's dictionary to those used in the user's document. The spell checker points out any words it cannot match, notifies the user, and allows them to make any changes; it even suggests possible correct spellings. Like a conventional thesaurus, this

database of words contains definitions and suggestions of words with similar and opposite meanings. A word may be spelled correctly but still be wrong (too instead of two, for instance). This is a good first step at proofing a document because it can find many common errors, but users will still need to proofread documents to ensure complete accuracy.

2. Many word processors include an online Q thesaurus with which users can look up different words to use in similar instances. Their power comes not from knowing every grammatical rule, but from questioning the writer about certain parts of the text. Some even include information about pronunciation and the history of a word.

3. Grammar checkers are applications that attempt to check more than just spelling.

They count words in sentences to flag possible run-on sentences. They look for words that show possible conflicts between verbs and subjects, and they offer advice about corrections. Grammar checkers are a step beyond spell checkers, but they are still not a substitute for a human editor. However, this does not mean that all the words in the document are spelled correctly. They give the writer another chance to think about what he or she has written. The computer can alert writers to problems that wouldn't be obvious to them otherwise.

Task 1. Read the descriptions more carefully. Find three sentences that have been printed in the wrong text and decide where they should go.

Task 2. Correct three mistakes in this sentence and decide if they would be found by the spell checker or the grammar checker.

Mail merge combine a form letter with a database file to create customized copies of the letter.

Writing. Write down the instruction on creating a document and saving it on a disk.

Questions for Self Control

1. What word processor software do you use?

Самостійна робота № 17

Theme Databases

Reading. Database

A **database** is a collection of related data, and the software used in databases to store, organize and retrieve the data is called the **database management system**, or **DBMS**. However, we often use the word database to cover both meanings. A database can manage any type of data, including text, numbers, images, sound, video and hyperlinks (links to websites).

Information is entered into the database via **fields**. Each field holds a separate piece of information, and the fields are grouped together in **records**. Therefore, a record about an employee might consist of several fields which give their name, address, phone number, date of birth, salary and length of employment with the company.

Records are grouped together into **files** which hold large amounts of information. Files can easily be **updated** -you can always change fields, add new records or delete old ones. An electronic database is much faster to consult and update than a card index system and occupies a lot less space. With the right software, you can keep track of stock, sales, market trends, orders and other information that can help your company stay successful.

A database program lets you create an **index** - a list of records ordered according to the content of certain fields. This helps you to search the database and sort records into numerical or alphabetical order very quickly.

Modern databases are **relational** - that is, they are made up of related files: customers and orders, vendors and purchases, students and tutors, etc. Two database files can be related as long as they have a common field. A file of students, for example, could include a field called Tutor ID and another file with details of the tutors could include the same field. This key field can be used to relate the two files. Databases like Oracle, DB2 and MySQL can manage these relationships.

A database **query** function allows you to extract information according to certain conditions or criteria. For example, if a managing director wanted to know all the customers that spend more than €8,000 per month, the program would search on the name field and the money field simultaneously.

The best database packages also include **network** facilities, which can make businesses more productive. For example, managers of different departments can have direct access to a common database. Most aspects of the program can be protected by user-defined passwords and other **security devices**. For example, if you wanted to share an employee's personal details but not their commission, you could protect the commission field.

Task 1. Complete these statements using information from the text.

1. A database management system is used to....
2. Information is entered into a database via
3. Each field holds....
4. Updating a file means....
5. Some advantages of a database program over a manual filing system are:
6. Access to a common database over a network can be protected by using....

Task 2. In pairs, discuss what fields you would include in a database for your music collection.

Task 3. Put the plurals into the correct pronunciation column.

databases	passwords
laptops	graphs
orders	switches

taxes
tables
spreadsheets

networks
packages
systems

Writing. What fields would you include in a database for a national police computer?

Questions for Self Control

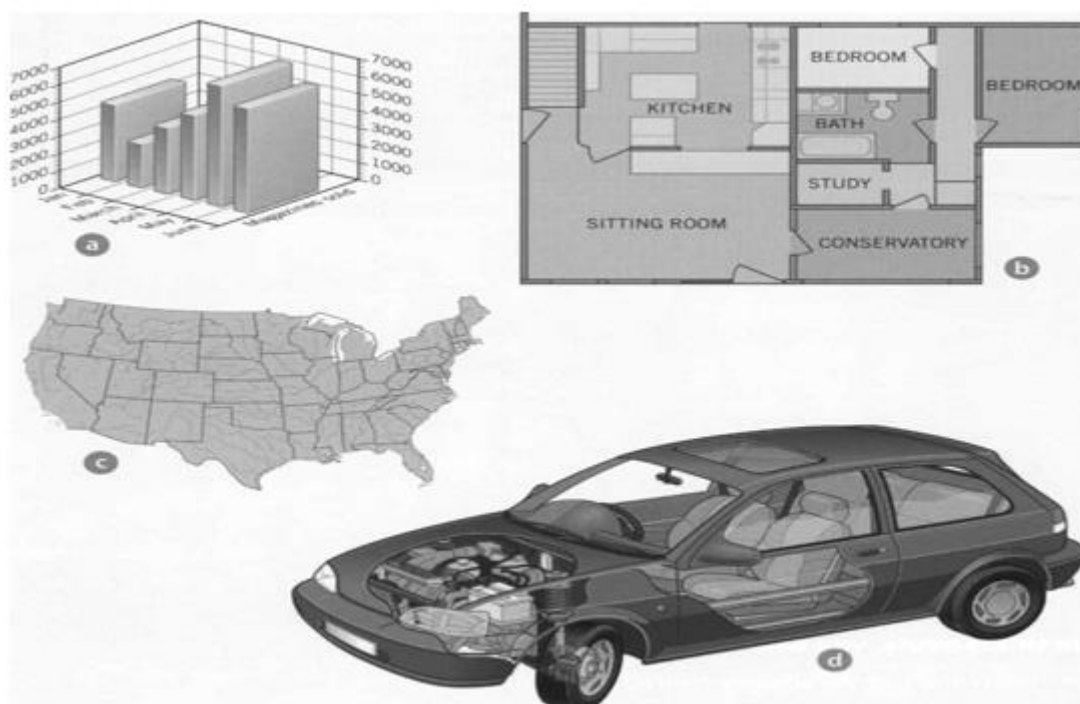
1. Do you use spreadsheets and databases in your work?

Самостійна робота № 18

Theme *Computer Graphics*

Task 1. In pairs, look at the computer graphics (a-d) and discuss these questions.

1. Which of these computer graphics are three -dimensional (3-D)?
2. What are the advantages of creating 3-D images?
3. Which types of professional might use the computer graphics (a-d)?
4. Who else uses computer graphics in their job? How do they use them?



Task 2. Read the text and check your answers to 3 and 4 in A.

Task 3. Read the text again and answer these questions.

1. What are the differences between raster graphics and vector graphics?
2. Which graphics file formats are mentioned?
3. What is compositing?
4. What does CAD stand for?
5. What are the benefits of using graphics in the car industry?

6. What type of graphics software is used to make maps or 3-D models of the Earth?
7. Who uses computer animation? How?

Reading. Computer Graphics

Computer graphics are pictures and drawings produced by computer. There are two main categories:

Raster graphics, or bitmaps, are stored as a collection of pixels. The sharpness of an image depends on the density of pixels, or **resolution**. For example, text or pictures that are scaled up - that is, made bigger - may show jagged edges. Paint and photo-editing programs like Adobe Photoshop focus on the manipulation of bitmaps. Popular raster formats are **JPEG, GIF** and **TIFF**.

Vector graphics represent images through the use of geometric objects, such as lines, curves and polygons, based on mathematical equations. They can be changed or scaled without losing quality. Vector data can be handled by drawing programs like Adobe Illustrator, Corel Draw or Macromedia Freehand. EPS is the most popular file format for exchanging vector drawings.

Almost all computer users use some form of graphics. Home users and professional artists use image-editing programs to manipulate images. For example, you can add **filters** (special effects) to your favourite photos, or you can **composite** images.

Compositing is combining parts of different images to create a single image. Graphic artists and designers use drawing programs to create freehand drawings and illustrations for books or for the Web. Businesspeople use presentation graphics to make information more interesting visually - graphs and diagrams can be more effective ways of communicating with clients than lists of figures. Electrical engineers use graphics to design circuits in order to present data in a more understandable form. Mechanical engineers use CAD (Computer Aided Design) software to develop, model and test car designs before the actual parts are made. This can save a lot of time and money.

CAD is also used in the aerospace, architecture and industrial sectors to design everything from aero planes and buildings to consumer products. Designers start a project by making a **wireframe**, a representation showing the outlines of all edges in a transparent drawing. They then specify and fill the surfaces to give the appearance of a 3-D solid object with volume. This is known as **solid modeling**.

Next, they add paint, colour and filters to achieve the desired “look and feel”: this is called **texturing** the object. Finally, they **render** the object to make it look real. Rendering includes lighting and shading as well as effects that simulate shadows and reflections.

Computer art, or digital art, is used in adverts and TV programmes. Artists and scientists use special graphic applets to create amazing **fractals**. Fractals are geometrical patterns that are repeated at small scales to generate irregular shapes, some of which describe objects from nature. Government

agencies use **GIS (Geographic Information Systems)** to understand geographic data and then plan the use of land or predict natural disasters. Cartographers use GIS to make detailed maps. Animators use **computer animation** software to create animated cartoons or add effects in movies and video games.

Task 4. Match the words (1-6) with the definitions (a-f).

- | | |
|---------------|---|
| 1. resolution | a) special effects that can be applied to pictures |
| 2. jagged | b) a technique that generates realistic reflections, shadows and highlights |
| 3. filters | c) geometrical figures with special properties |
| 4. wireframe | d) irregular or uneven |
| 5. rendering | e) the number of pixels in an image |
| 6. fractals | f) the drawing of a model by using features like edges or contour lines |

Task 5. In pairs, discuss which application of computer graphics you think is the most important or useful.

Writing. Write your opinion regarding the Task 5.

Questions for Self Control

1. What software is used for computer assisted design?

Самостійна робота № 19

Theme A Typical Web Page

Task 1. How many of the features (ask) can you say in English? Draw your own web page.

Reading. A typical Web Page

At the top of the page is the **URL** address. URL means Uniform Resource Locator - the address of a file on the Internet. A typical URL looks like this:
<http://www.bbc.co.uk/radio/>.

In this URL, <http://> means Hypertext Transfer Protocol and tells the program to look for a web page, www means world wide web. bbc.co.uk is the domain name of the server that hosts the website - a company based in the UK; other top-level domains are .com (commercial site), .edu (education), .org (organization) or .net (network); radio is the directory path where the web page is located.

The parts of the URL are separated by . {dot}, / {slash} and : {colon}. Some sites begin <ftp://> , a file transfer protocol used to copy files from one computer to another.

The toolbar shows all the navigation icons, which let you **go back one page** or **go forward one page**. You can also go to the home page or stop the current transfer when the circuits are busy.

Tab buttons let you view different sites at the same time, and the built-in search box helps you look for information. If the **feed button** lights up, it means the site offers RSS feeds, so you can automatically receive updates. When a web page won't load, you can **refresh the current page**, meaning the page reloads (downloads again). If you want to mark a website address | so that you can easily revisit the page at a later time, you can add it to your favourites {favorites in American English), or bookmark it. When you want to visit it again you simply click **show favourites**.

On the web page itself, most sites feature **clickable image links** and **clickable hypertext links**. Together, these are known as hyperlinks and take you to other web pages when clicked.

Writing. Describe the home page.

Questions for Self Control

1. What are the features of a typical web page?

Самостійна робота № 20

Theme Computer Languages

Reading. Computer Languages

Unfortunately for us, computers can't understand spoken English or any other natural language. The only language they can understand directly is **machine code**, which consists of 1 s and Os (binary code).

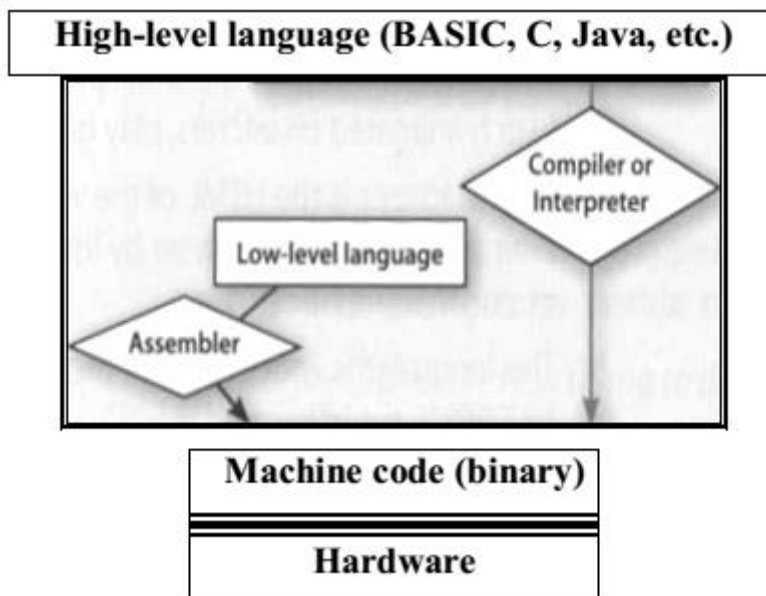
Machine code is too difficult to write. For this reason, we use symbolic languages to communicate instructions to the computer. For example, **assembly languages** use abbreviations such as ADD, SUB, MPY to represent instructions. The program is then translated into machine code by a piece of software called an assembler. Machine code and assembly languages are called **low-level languages** because they are closer to the hardware. They are quite complex and restricted to particular machines. To make the programs easier to write, and to overcome the problem of intercommunication between different types of computer, software developers designed **high-level languages**, which are closer to the English language. Here are some examples:

- **FORTRAN** was developed by IBM in 1954 and is still used for scientific and engineering applications.
- **COBOL** (Common Business Oriented Language) was developed in 1959 and is mainly used for business applications.
- **BASIC** was developed in the 1960s and was widely used in microcomputer programming because it was easy to learn. Visual BASIC is a modern version of the old BASIC language, used to build graphical elements such as buttons and windows in Windows programs.
- **PASCAL** was created in 1971. It is used in universities to teach the fundamentals of programming.
- **C** was developed in the 1980s at AT&T. It is used to write system software, graphics and commercial applications. **C++** is a version of C which incorporates

object-oriented programming: the programmer concentrates on particular things (a piece of text, a graphic or a table, etc.) and gives each object functions which can be altered without changing the entire program. For example, to add a new graphics format, the programmer needs to rework just the graphics object. This makes programs easier to modify.

■ **Java** was designed by Sun in 1995 to run on the Web. Java applets provide animation and interactive features on web pages

Programs written in high-level languages must be translated into machine code by a compiler or an interpreter. A **compiler** translates the source code into object code - that is, it converts the entire program into machine code in one go. On the other hand, an **interpreter** translates the source code line by line as the program is running.



It is important not to confuse **programming languages** with markup languages, used to create web documents. Markup languages use instructions, known as **markup tags**, to format and link text files. Some examples include:

■ **HTML**, which allows us to describe how information will be displayed on web pages.

■ **XML**, which stands for Extensible Markup Language. While HTML uses predefined tags, XML enables us to define our own tags; it is not limited by a fixed set of tags.

■ **VoiceXML**, which makes Web content accessible via voice and phone.

VoiceXML is used to create voice applications that run on the phone, whereas HTML is used to create visual applications (for example, web pages).

```
<xml>
< name> Andrea Finch </name>
< homework> Write a paragraph describing
< the Clanguage </homework>
</xml>
```

In this XML example we have created two new tags: <name> and <homework>

Task 1. Read the text again and answer these questions.

1. Do computers understand human languages? Why? / Why not?
2. What is the function of an assembler?
3. Why did software developers design high-level languages?
4. Which language is used to teach programming techniques?
5. What is the difference between a compiler and an interpreter?
6. Why are HTML and VoiceXML called markup languages?

Task 2. Complete these sentences with a computer language from the text.

1. allows us to create our own tags to describe our data better. We aren't constrained by a pre-defined set of tags the way we are with HTML.
2. IBM developed in the 1950s. It was the first high-level language in data processing.
3. applets are small programs that run automatically on web pages and let you watch animated characters, play games, etc.
4. is the HTML of the voice web. Instead of using a web browser and a keyboard, you interact with a voice browser by listening to pre-recorded audio output and sending audio input through a telephone.
5. This language is widely used in the business community. For example, the statement ADD VAT to NET-PRICE could be used in a program.

Writing. Make notes about main features of the languages mentioned in the text.

Questions for Self Control

1. What programming languages do you know?

Самостійна робота № 21

Theme *The Java Language*

Task 1. These statements about Java are all false. Read the text and correct them.

1. Java was invented by Microsoft.
2. With the interpreter, a program is first converted into Java bytecodes.
3. Java is not compatible with most computing platforms.
4. The Java language is single-threaded, one part executing at a time.
5. Java has no competitors.
6. Flash files are called animations.

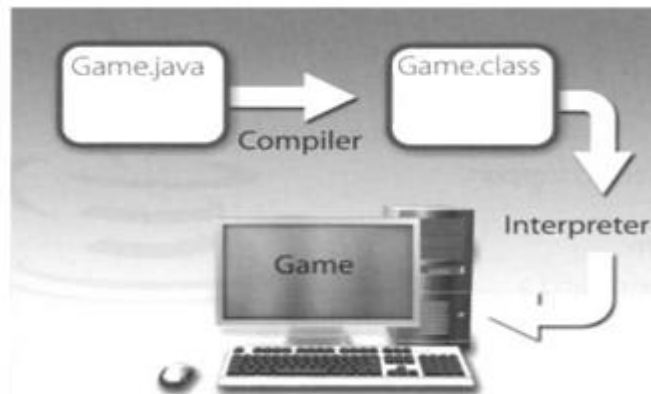
Reading. The Java Language

Java is a programming language developed by Sun Microsystems, specially designed to run on the Web. Java programs (called applets) let you watch animated characters and moving text, play music, and interact with information on the screen (for example, control animations and select options).

Characteristics of the Java language

Java is an object-oriented language, similar to C++, but more dynamic and simplified to eliminate possible programming errors. A Java program is both compiled and interpreted (see Unit 24). First, the source code (a file with a .Java extension) is compiled and converted into a format called byte code (a file with a .class extension), which can then be executed by a Java interpreter (see Fig. 1). Compiled Java code can run on most computers because there are Java interpreters, known as Java Virtual Machines, for most operating systems.

Java is multi-threaded, meaning a Java program can have multiple threads (parts) - that is, many different things processing independently and continuously. This enables the program to make the best use of available CPU power.



Why is Java popular?

Most programmers like Java because it allows them to write applets which make web pages more interactive and attractive. They can create graphical objects (for example, bar charts and diagrams) and new controls (for example, check boxes and push buttons with special properties). A web page that uses Java can have sounds that play in real time, music that plays in the background, cartoon-style animations, real-time video and interactive games.

The Java Micro Edition platform (Java ME) is used in mobile devices. It provides flexible tools to create applications that run on mobile phones, PDAs, TV set-top boxes and printers. Nowadays, most phones are configured to use Java games.

Alternatives to Java

One alternative to Java is Microsoft's C#, pronounced 'C sharp', a .NET language based on C++ with elements from Visual Basic and Java. There are no substantial differences between C# and Java. When software developers do measurements on pieces of code, sometimes Java is faster, sometimes C# is.

Another competitor is Adobe Flash technology, which supports graphics, a scripting language called ActionScript, and the streaming of audio and video. Flash is used to create animation and advertisements, to integrate video into web pages, and to develop rich internet applications such as portals. Flash files, traditionally called flash movies, have a swf file extension. They may be an object on a web page or be played in the stand-alone Flash Player.

Task 2. Complete the sentences with words from the box.

interpreted	animated	configured	used	pronounced	object-oriented
-------------	----------	------------	------	------------	-----------------

compiled

1. Java lets you watch characters on web pages.
2. Java is anlanguage, similar to C++ but more dynamic.
3. First, the source code of a Java program is into an intermediate format called byte code. This is then by any system possessing a Java interpreter.
4. The Java ME platform is widely in mobile devices.
5. Nowadays, most mobile phones are to use Java games.
6. Microsoft's C# is a simplified version of C and C++ for the Web. It's C sharp'.

Task 3. Match the words

- | | |
|----------------|-------------|
| 1. Java | a) applet |
| 2. operating | b) page |
| 3. programming | c) code |
| 4. web | d) system |
| 5. source | e) object |
| 6. graphical | f) language |

Task 4. Complete this extract from a lecture handout about Java with the correct form of the verbs in the box.

call be begin can decide rename have support develop base

The idea for Java started in 1990, when a team of software engineers at Sun Microsystems (1) to create a language for a handheld device that could control and interact with various kinds of electronic appliances, ranging from Nintendo Game Boys to VCRs and TV set-top boxes. They (2) an object-oriented programming language that one of the engineers, James Gosling, (3) Oak, after the tree outside his window. The device even (4) an animated character named Duke, who would go on to become Java's mascot.

With the advent of the Web in 1993, the company made a web browser (5) on the Oak language. Later on, this language was adapted to the Internet and (6) Java. The 1.0 version of Java was officially introduced by Sun in May 1995. At that time, web pages (7) only display text, pictures and hyperlinks.

With the arrival of Java, web designers (8) able to include animation and interactive programs on web pages. The first major application created with Java was the Hotjava browser. The Java language (9) to attract serious attention from the internet community and was soon (10) by Netscape Navigator and MS Internet Explorer.

Today, Java is a hot technology that runs on multiple platforms, including smart cards, embedded devices, mobile phones and computers.

Writing. Write an essay about the computer languages development.

Questions for Self Control

1. What is Java used for?

Самостійна робота № 22

Theme *Security and Privacy on the Internet*

Task 1. Read the text quickly and see how many of your ideas from 1A Question 3 are mentioned.

Task 2. Read the text more carefully and answer these questions.

1. Why is security so important on the Internet?
2. What security features are offered by Mozilla Firefox?
3. What security protocol is used by banks to make online transactions secure?
4. How can we protect our email and keep it private?
5. What methods are used by companies to make internal networks secure?
6. In what ways can a virus enter a computer system?
7. How does a worm spread itself?

Reading. Security and Privacy on the Internet

There are many benefits from an open system like the Internet, but one of the risks is that we are often exposed to hackers, who break into computer systems just for fun, to steal information, or to spread viruses (see note below).

So how do we go about making our online transactions secure?

Security on the Web

Security is crucial when you send confidential information online. Consider, for example, the process of buying a book on the Web. You have to type your credit card number into an order form which passes from computer to computer on its way to the online bookstore. If one of the intermediary computers is infiltrated by hackers, your data can be copied. To avoid risks, you should set all security alerts to high on your web browser. Mozilla Firefox displays a lock when the website is secure and allows you to disable or delete **cookies** - small files placed on your hard drive by web servers so that they can recognize your PC when you return to their site.

If you use online banking services, make sure they use **digital certificates files** that are like digital identification cards and that identify users and web servers. Also be sure to use a browser that is compliant with SSL (Secure Sockets Layer), a protocol which provides secure transactions.

Email privacy

Similarly, as your email travels across the Net, it is copied temporarily onto many computers in between. This means that it can be read by people who illegally enter computer systems.

The only way to protect a message is to put it in a sort of virtual envelope - that is, to encode it with some form of **encryption**. A system designed to send email privately is Pretty Good Privacy, a **freeware** program written by Phil Zimmerman.

Network security

Private networks can be attacked by intruders who attempt to obtain information such as Social Security numbers, bank accounts or research and business reports. To protect crucial data, companies hire security consultants who analyze the risks and provide solutions. The most common methods of protection

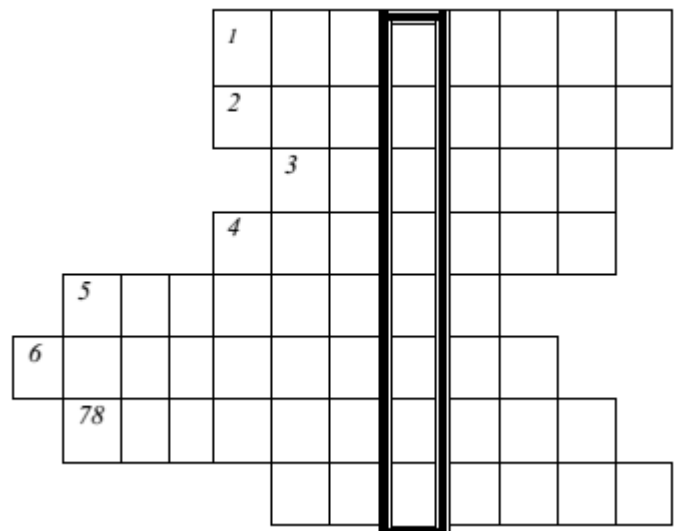
are passwords for access control, firewalls, and encryption and decryption systems. Encryption changes data into a secret code so that only someone with a key can read it. Decryption converts encrypted data back into its original form.

Malware protection

Malware (malicious software) are programs designed to infiltrate or damage your computer, for example viruses, **worms, Trojans and spyware**. A virus can enter a PC via a disc drive - if you insert an infected disc - or via the Internet. A worm is a self-copying program that spreads through email attachments; it replicates itself and sends a copy to everyone in an address book. A Trojan horse is disguised as a useful program; it may affect data security. Spyware collects information from your PC without your consent. Most spyware and adware (software that allows pop-ups - that is, advertisements that suddenly appear on your screen) is included with 'free' downloads.

If you want to protect your PC, don't open email attachments from strangers and take care when downloading files from the Web. Remember to update your anti-virus software as often as possible, since new viruses are being created all the time.

Note: Originally, all computer enthusiasts and skilled programmers were known as hackers, but during the 1990s, the term hacker became synonymous with cracker - a person who uses technology for criminal aims. Nowadays, people often use the word hacker to mean both things. In the computer industry, hackers are known as white hats and crackers are called black hats or dark side hackers.



Task 3. Solve the clues and complete the puzzle.

1. Users have to enter a to gain access to a network.
2. A ... protects a company intranet from outside attacks.
3. A ... is a person who uses their computer skills to enter computers and networks illegally.
4. can infect your files and corrupt your hard drive.
5. You can download ... from the Net; this type of software is available free of charge but protected by copyright.
6. Encoding data so that unauthorized users can't read it is known as
7. This company uses ... techniques to decode (or decipher) secret data.

8. Most ... is designed to obtain personal information without the user's permission.

Writing. Discuss the questions in writing (Task 2).

Questions for Self Control

1. What Internet security measures do you know?

Самостійна робота № 23

Theme *The History of Hacking. Cybercrimes*

Task 1. Read Part I of the text and answer these questions.

1. Which hacking case inspired the film War Games!
2. When did Captain Zap hack into the Pentagon?
3. Why was Nicholas Whitely arrested in 1988?
4. How old was the hacker that broke into the US defence computer in 1989?

Reading. The history of Hacking - Part I

1971 - John Draper discovered that a whistle offered in boxes of Cap'n Crunch breakfast cereal perfectly generated the 2,600Hz signal used by the AT&T phone company. He started to make free calls. He was arrested in 1972 but wasn't sent to prison.

1974 - Kevin Mitnick, a legend among hackers, began hacking into banking networks and altering the credit reports of his enemies. He didn't expect that his most famous exploit - hacking into the North American Defense Command in Colorado Springs - would inspire the film War Games in 1983.

1981 - Ian Murphy, a 23-year-old known as Captain Zap on the networks, hacked into the White House and the Pentagon.

1987 - The IBM international network was paralyzed by a hacker's Christmas message.

1988 - The Union Bank of Switzerland almost lost £32 million to hackers. Nicholas Whitely was arrested in connection with virus spreading.

1989 - A fifteen-year-old hacker cracked the US defense computer.

1991 - Kevin Poulsen, known as Dark Dante on the networks, was accused of stealing military files.

Task 2. In pairs, discuss which of the cases in Part I you had heard of. Which do you think is the most important?

Reading. The history of Hacking - Part II

1992 - David L Smith (1) prosecuted for writing the Melissa virus, which was passed in Word files sent via email.

1997 - The German Chaos Computer Club (2) on TV how to obtain money from bank accounts.

2000 - A Russian hacker (3) to extort \$100,000 from online music retailer CD

Universe.

A Canadian hacker (4) a massive denial of service attack against websites like Yahoo! and Amazon.

The I Love You virus, cleverly disguised as a love letter, (5) so quickly that email had to be shut down in many companies. The worm (6) image and sound files with a copy of itself.

2001 - The Code Red worm (7) tens of thousands of machines

2006 - Hackers (8) the credit card details of almost 20,000 AT&T online customers.

However, subscribers to its service (9) (not).....

Task 3. Read these landmarks in the history of the Internet and prepare at least five questions in the past simple.

Example: *What happened in 1969? What did Ray Tomlinson do in 1971?*

1969 - The US Defense Department establishes ARPANET, a network connecting research centres.

1971 - Ray Tomlinson of BBN invents an email program to send messages across a network. The @ sign is chosen for its at meaning.

1981 - IBM sells the first IBM PC. BITNET provides email and file transfers to universities.

1982- TCP/IP is adopted as the standard language of the Internet.

1988 - Jarkko Oikarinen develops the system known as Internet Relay Chat (IRC).

1991 - CERN (Conseil Européen pour la Recherche Nucléaire) creates the World Wide Web.

1998 - The Internet 2 network is born. It can handle data and video at high speed but is not a public network.

1999 - Online banking, e-commerce and MP3 music become popular.

2001 - Napster, whose software allows users to share downloaded music, maintains that it does not perpetrate or encourage music piracy. However, a judge rules that Napster's technology is an infringement of music copyright.

2004 - Network Solutions begins offering 100-year domain registration.

2006 - Americans spend over \$100 billion shopping online.

Task 4. In pairs, ask and answer your questions.

Task 5. In small groups, look at the list of cybercrimes and discuss these questions.

1. Which crimes are the most dangerous?
2. Is it fair or unfair to pay for the songs, videos, books or articles that you download? Should copyright infringement be allowed online?
3. What measures can be taken by governments to stop cybercrime?
4. Do you think governments have the right to censor material on the Internet?
5. Personal information such as our address, salary, and civil and criminal records is held in databases by marketing companies. Is our privacy in danger?

Reading. Cybercrimes

- *Piracy* - the illegal copy and distribution of copyrighted software, games or music files.
- *Plagiarism* and *theft of intellectual property* - pretending that someone else's work is your own.
- *Spreading of malicious software.*
- *Phishing (password harvesting fishing)* - getting passwords for online bank accounts or credit card numbers by using emails that look like they are from real organizations, but are in fact fake; people believe the message is from their bank and send their security details.
- *IP spoofing* - making one computer look like another in order to gain unauthorized access.
- *Cyber stalking* - online harassment or abuse, mainly in chat rooms or Newsgroups.
- *Distribution of indecent or offensive material.*

Writing. Write a summary of your discussion on PowerPoint and present it to the rest.

Questions for Self Control

1. Which crimes are the most dangerous?
2. What is hacking?

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Іноземна мова за професійним спрямуванням [Текст]: методичні вказівки до самостійної роботи для здобувачів освітньо-професійного ступеня фаховий молодший бакалавр спеціальності 122 Комп'ютерні науки денної форми здобуття освіти/уклад. Оксана Грисюк. – Ковель: ВСП «КПЕФК ЛНТУ», 2024. – 47с.

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