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STARTING COMPUTERS AND IT

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Учебное пособие представляет собой интегрированный курс для бакалавров и студентов факультетов ИТ и кибернетики, изучающих язык специальности в области компьютерных технологий, целью которого является совершенствование у обучающихся лингвистических, иноязычной коммуникативной и переводческой компетенций. Модульная организация учебного материала, в основу которой положен аутентичный текстовый материал, снабженный комментариями, разноуровневыми вариативными заданиями и вокабуляром, позволяют выстроить логику поэтапного овладения заявленных компетенций и реализовать важнейшие дидактические принципы системности и доступности.

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Unit 1

Computers, computing, and IT. General definitions

A **computer** is a device for storing, accessing, and processing information, for example by sorting it or doing calculations on it. This is **computing**.

Information handled by computers is **data**.

Information technology, or IT, covers the technology of computing and, increasingly, **telecommunications**, or **telecoms**, the electronic transmission of information.

Computers are accessible. Far from being the clumsy machines they used to be, computers are now usable, and in most developed countries, affordable.

The history of computing serves only to emphasise that man has invented something very different from a brain: something that is good at precise, fast, encyclopedic memory, sorting and calculation (and perhaps chess), but not at painting, politics or philosophy.

International standards for sending data between computers should enable any manufacturer's equipment to talk to that of any other.

State of the art telecommunications technology makes geographical location irrelevant.

America's media, telecoms and computer industries are coming together to form a single business, the bit business.

Technology, especially information technology, is destroying millions of jobs. The hope is that it will create more than it destroys. The research group sees a growing gulf between individuals who understand information technology and those who are frightened by computers or can't afford to buy them. It also believes that the technology will widen the gap between rich and poor, with rich countries educating people to be IT managers, and poor countries training people to be badly paid keyboard operators.

Supercomputers are very large, powerful computers used for complex mathematical tasks.

Mainframes are also very large, and often used for the central functions of a company, or as the central computer of a university, where they may be accessed by many users simultaneously.

Minicomputers are mid-sized computers that also allow simultaneous access.

The **personal computer** or **PC** originated as the IBM-PC in the early 1980s, and has since become the standard computer for most individual users.

PCs are either **desktops** or **portables: laptops** and **notebooks**. Even smaller computers are **palmtops**.

In the 1980s, departments bought their own minicomputers and managers bought their own PCs. These delivered control and flexibility, but buried most of the information where the rest of the company couldn't find it. The PC has won the desktop wars.

Companies that only make portables will try to convince you that their machines are so powerful that all you need is one big powerful machine and that a separate machine in the office is a waste of money. Now the books are in the bag; the laptop is under my arm; and I am ready to leave. The main advantage of using a notebook computer is that you can take all your programs and files with you wherever you go.

A palmtop's ancestry owes more to the electronic calculator than to the PC. It is certainly the only type that is both light and small enough to fit into a jacket pocket. It is typically 6 inches long, 4 inches wide and about half an inch thick.

Computers handle data in the form of **bits**, numbers expressed in ones and zeros. Data in this form is described as **digital** or, less frequently, **binary**.

When information exists in or is transferred into digital form it is **digitized**.

Data is measured in **bytes**. A byte is usually eight bits and can represent one of 256 values, from 00000000 to 11111111.

Roughly speaking, a **kilobyte** is one thousand bytes, a **megabyte** is one million bytes, and a **gigabyte** is one thousand million bytes of data.

Kilobyte is abbreviated as **Kb** or **kb**, **megabyte** as **Mb** or **mb**, and **gigabyte** **Gb** or **gb**.

Word list

computer
computing
data
information technology
IT
telecommunications
telecoms
desktop
laptop
mainframe
minicomputer
notebook
palmtop
personal computer
PC
portable
supercomputer
bit
binary digital
digitize = digitise (British English)
byte
kilobyte
megabyte
gigabyte

Exercise 1

Look through the text and agree or disagree with the following statements. Begin your answers with: "According to the text..."

- 1 IT refers only to the technology of computing.
- 2 Computers can replace people in all spheres of life.
- 3 Information technology is destroying millions of jobs. It will widen the gap between rich and poor.
- 4 Nobody knows what kind of role have PCs played in the world.

Exercise 2

Give the terms defining the following:

- 1 Technology of computing and electronic transmission of information (telecommunication).
- 2 Large, powerful computers used for complex mathematical tasks.
- 3 The central computer of any enterprise for many users accessed simultaneously.
- 4 A standard computer for most users
- 5 A light and small computer enough to fit into a jacket pocket.
- 6 Mid-sized computers allowing simultaneous access for many users.
- 7 Numbers expressed in ones and zeros.

Exercise 3

Match the two parts of these extracts

- 1 NEC, the Japanese electronics company, announced last week that it has created a memory chip capable of holding 1 million bits of information.
- 2 Windows 95 shifts information about inside the computer in 32-bit chunks.
- 3 NASA plans to launch the satellites of the Earth Observing System between 1998 and 2012. They will monitor climatic and

environmental factors including cloud cover, snow, sea ice, ocean circulation, and greenhouse gases.

- 4 Nextbase uses a 1:625,000 digital map of Britain as the basis of its computerised route-mapping system, Autoroute. The program runs on a standard personal computer, with the geographical data squeezed into 800 kilobytes.
 - 5 Each second of film requires 120 megabytes of memory. *Toy Story* runs for 77 minutes, making the total memory required more than 500,000 megabytes.
 - 6 During the 687-day mapping period, Mars Observer will return 90 gigabytes of data.
-
- a Drawing the full, final version of the film took 800,000 hours on Silicon Graphics computers and Sun Microsystems computers.
 - b instead of 16-bit chunks.
 - c more than has been returned by all previous planetary missions put together.
 - d The new chip can hold text equivalent to 10 copies of the complete works of Shakespeare or 15 minutes of video.
 - e The satellites are expected to send as much as 1 trillion bytes of information to ESDIS every day.
 - f Users enter the start and end of their journey, and the program works out the shortest or theoretically quickest route.

Exercise 4

Comment on the following:

- 1 Computers can solve a great variety of problems without becoming tired or bored and in this way they are different from a human brain.
- 2 Computers as we know them today have gone through many

changes and haven't remained the same for long.

- 3 Computers handle data in the form of bits (numbers or digits).
- 4 Technology, especially information technology is destroying million of jobs.
- 5 State of the art telecommunications technology makes geographical location irrelevant.

Exercise 5

According to the text explain the difference between:

- 1 the mainframe and the supercomputer
- 2 the minicomputer and PC
- 3 the notebook and palmtop.

Exercise 6

According to the key-phrases given below find in the text the sentences telling us about IT. Read the sentences and translate them

- a geographical location irrelevant
- b telecoms and computer industries
- c destroying millions of jobs
- d the research group
- e can't afford to buy
- f to be badly paid
- g keyboard operations

Exercise 7

Give your own opinion on the text read

Think of some extra information known for you about computers and computing as well as about IT

Exercise 8

Read this short article from *The Economist* and answer the questions

Revenge of the mainframe

...Mr Cray's vision, from the Univac 1604, which he designed in the 1950s, to the Cray 1 supercomputer (1976), was one of centralised computing power and control: a liquid-nitrogen cooled black shrine in the middle of a sealed white room to which supplicants came carrying programs.

Until the 1980s computers were all mainframes, and Mr Cray's were the biggest of the lot. Then came the ubiquitous, ever-cheaper and ever-more-powerful personal computer.

Mr Cray's response was to opt for ever-more exotic technology. He spent \$200 million on development without a single sale. Most other mainframe and supercomputer companies have redesigned their machines to find a niche in an increasingly PC-dominated world.

Their approach recognises that the old model of users with dumb terminals submitting programs to be run overnight by data-processing beasts in the basement has gone the way of the punchcard. But the idea of a powerful, reliable machine that can run the payroll, handle sales and churn out bills - all the boring-but-essential work of running a company - still makes sense. ...

- 1 Are shrines and supplicants usually associated with a) science, b) religion, or c) computing?
- 2 If something is ubiquitous, is it rare?
- 3 If you opt for something, do you a) choose it, or b) reject it?
- 4 If you have a niche in the market, do you have a very large part of the market?
- 5 Are punchcards still used in computing?
- 6 Is it possible to churn out something in small numbers?
- 7 Does the article suggest that mainframes are no longer necessary?

Exercise 9

Complete the following sentences with a word from the box. Write your answers in the puzzle and read the vertical word, defining a kind of a link

a

b

c

d

e

f

g

h

- a When a person needs to store or manipulate numbers, letters or characters he uses a _____.
- b The program which tells the computers what to do is kept inside the computer in a place called _____.
- c One thousand bytes of information is _____.
- d Very large and power computers used for complex mathematical tasks are called _____.
- e To run a single program people often use mid-sized computers called _____, which also provide system access to either a single user or to a limited number of users at a time.
- f There is a computer named a _____ computer which can take all your programs and files with you wherever you go.
- g Users can't still manage without very large computers or _____ executing jobs very rapidly and easily and providing the access for many users simultaneously.
- h The capability of a computer to manipulate numbers, letters or characters or to perform different kind of operations is defined as _____.

Unit 2

Processors. Storage

The **central processing unit** or **CPU** of a computer is a **microprocessor**, based on a **chip** or **microchip**, a small piece of **silicon** with a very large number of electronic circuits on it.

Silicon and the components made from it are **semiconductors**.

PCs became possible only because chip manufacturers had managed to cram a simple version of a computer's central processing unit, the circuits that did most of the actual computing, on to a single chip. Appropriately, this was called a microprocessor.

Three developments made cheap chips possible: smaller circuits, fewer electronic components per circuit and bigger silicon wafers. Semiconductor engineers are still moving as fast as ever towards further miniaturisation.

One type of microprocessor is designed for **RISC**, standing for **Reduced Instruction Set Computing**. This makes for *faster processing*. *Academics at Stafford and Berkeley suggested simplifying the instructions and saving time on the business of breaking them down: this was reduced instruction set computing (RISC).*

Data and instructions for processing it are held in **memory** on **memory chips**.

Memory is of different kinds such as **read-only memory** or **ROM**, **random access memory** or **RAM**, and others, as explained in the example.

Data can be stored in a variety of ways. The longer term storage on a personal computer is usually magnetic, in the form of a **hard disk** or **hard drive**.

If you want to make the world's most compact computer memory, perhaps the smallest thing you could use to represent a bit of information would be one electron. The capacity of memory chips has quadrupled and quadrupled again as the process of etching minute

circuits onto silicon has been pushed further and further.

A personal computer contains two principal types of memory: ROM (for read-only memory) which cannot be altered, and RAM, usually in the form of DRAM (for dynamic random access memory) which can be changed but loses all data if power stops.

This is another side-effect of using your PC regularly: the more you work, the more the storage on your hard disk gets distributed across the surface. Today's densest hard drives, which store tens of billions of bits, pack them about a thousandth of a millimetre apart.

Data may also be stored on removable **compact disks** or **CDs**. A CD which can only be read by a computer, but to which data cannot be written, is a **CD-ROM**, short for 'compact disk read-only memory'.

Small, removable **floppy disks** or **floppies** are also used to store data, especially on PCs.

A **card** contains the circuitry needed for a particular computer function, such as graphics, sound, or even data storage.

According to developers, this new technology will make CDs, laser disks and CD-Roms outdated by the end the decade. The four firms have finally agreed on the standard for this high-density compact disk that can carry 4.7 gb of data on its five inches. If someone comes home from work or school with something interesting on a floppy, ask what it is before you give it hard-disk space on your machine. Floppy disks have always been cheap to make and relatively easy to copy.

The graphics card on Silicon Graphics' new workstation contains 18 million transistors, which the company claims can perform the equivalent work of hundreds of Pentium chips.

Word list

central processing unit (CPU)

microprocessor

chip

microchip
silicon
semiconductor
memory
memory chip
read-only memory =
= ROM
random access memory =
= RAM
hard disk (disc in British English)
hard drive
compact disk =
= CD
CD-ROM
floppy
floppy disk
card

Exercise 1

Read the text and answer the following questions

- 1 What is the article about?
- 2 Why do PCs become possible?
- 3 What is a microprocessor? Can we call it a single semiconductor device?
- 4 What types of memory do you know?
- 5 Are there any new developments in the field of storing information?

Exercise 2

Comprehension check

Read the article again. Correct these false statements about processors and storage

- 1 Microprocessor is a central processing unit which is build as a

metallic element with semiconductors characteristics

- 2 Chip is a tiny piece of silicon with one electronic circuit on it.
- 3 Semiconductors can't make computers to be fast, small and cheap.
- 4 A personal computer doesn't contain ROM or RAM memories.
- 5 There is no problem with DRAM memory as information is retained when power is removed.
- 6 One can hardly store information in floppies as they are very expensive and quite difficult to copy.
- 7 Pentium has declared about the graphic card which contains up to 10 millions transistors to perform specific computer functions.

Exercise 3

Indicate whether the following ideas are stated or not stated in the text.

- 1 Chips are small pieces of silicon which are non-metallic elements with a semiconductor characteristics.
- 2 The processor of a computer is printed on a chip.
- 3 The development of chip technology has revolutionized the computer field and moved towards computer miniaturization.
- 4 There are different types of memory.
- 5 RAM and DRAM memory has one disadvantage – it loses information when power stops.
- 6 CDs, CD-ROMs, floppy disks, cards, laser discs – are devices to store information.

Exercise 4

Say which statement best expresses the main idea of the text. Why do you eliminate the other choices?

- 1 Data can be stored in a variety of ways.
- 2 Types of memory a PC contains.
- 3 The possibility of storage on CDs.

- 4 The graphic card is far superior to other storage devices.
- 5 PCs became possible only because of semiconductors memory (or chip)

Exercise 5

Give the explanation to the following abbreviations

CPU

RISC

ROM

RAM

DRAM

CD

CD-ROM

Exercise 6

Translate into Russian the words and definitions given in the text in italics

Exercise 7

The word 'instruction' has been omitted twice and the word 'instructions' three times from this article from *The Economic*. Where do they occur?

RISC Business

Although RISC machines have to use many to perform tasks that their rivals could manage with one, they compensate by executing simple very quickly. Several steps are required to perform an in a microprocessor.

First an code is fetched from the memory. Then the

microprocessor deciphers this sequence of 0s and 1s to determine what it is being told to do. Then the results of the operation are stored.

To maintain order within the computer, these operations are performed in strict sequence, synchronised to the ticking of a central clock. Simpler allow the clock to tick faster.

But me biggest gains come from taking advantage of simplicity to reorganise the flow of work through the chip.

Exercise 8

Read this article from the *New Scientist* and complete the table below about the devices described in the article. (The first line of the table has been completed for you. If an item of information is not given in the article, put 'not mentioned' in the table.)

How Flash wins when the Chips are Down

...Conner Peripherals of California supplies 2.5 inch disk drives able to store 120 megabytes of data. In contrast, an Intel flash card with up to 20 megabytes of data is about the same size as four credit cards stacked on top of each other: 86 millimetres long, 54 millimetres wide and just 3 millimetres deep.

...If you compare a flash memory card and a typical 2.5 inch drive, flash wins on a number of fronts. Its specified access time, representing the time it takes to retrieve data, is 250 nanoseconds, against 20 milliseconds. Power consumption is 250 milliwatts as the memory is accessed and 5 milliwatts when on stand-by; the hard disc consumes 3 watts during access and 500 milliwatts while waiting.

The flash card weighs 28 grams, the hard disc 150 grams. And flush can bear shocks of 50G, compared with 5G for the hard disc....

Hard discs still have their advantages. The first is that flash can

only be erased a limited number of times, although that limit is 100.000 for an Intel flash card. The second, and biggest, is price. A 20-megabyte Intel flash card costs \$400 from a short production run of 1.000....

One of the most important attributes of flash memory is its ability to retain data without power, known as 'non-volatility'.

Data can also be erased and recorded on flash while it is in a computer or other device, although erasing must be done in blocks of kilobytes, rather than bit-by-bit, as is possible with hard discs or other storage media....

	2.5 inch drive	Flash
Capacity	120 megabytes	20 megabytes
Access time		
Power consumption during access		
Power consumption on standby		
Weight		
Resistance to shocks		
Volatile?		
Reprogrammable bit by bit?		

Exercise 9

Answer the following questions:

- 1 What does the article refer to?
- 2 Just fancy you have to choose between flash memory card and hard disk. What list of pros and cons will you make up to solve the problem?

Unit 3

Peripherals. Operating systems and applications.

Information is displayed on a **monitor**, **screen**, or, more technically, a **visual display unit** or **VDU**.

Data is usually entered into a computer by typing on a **keyboard**, often in combination with a screen pointing device known as a **mouse**. Information can be printed on a **printer**. Text and pictures on paper can be directly fed into a computer using a **scanner**.

A **modem** is a device for connecting a computer via telephone lines to other computers. These and similar devices are **peripherals**.

The physical machinery of computers: processing and memory devices, and peripherals, are together referred to as **hardware** (... *the central processor (which can perform a huge number of calculations very quickly) and the 'peripherals' of the computer, such as keyboard, monitor, screen, disc drives and external data links*). *Modem airliners use a mix of traditional instruments and computer-generated ones that appear on a VDU screen. Computers which use an electronic mouse to point at pictures on the screen are easier for the keyboard-shy. Today, because the personal computer and the laser-printer are mass produced and work using cheap electronic components, anybody can publish text of almost professional quality for a small investment.*

They predict that magazine publishers will soon start worrying about the boom in the sales of desktop publishing software and optical scanners which can copy text and images into DTP documents. Anybody equipped with a computer, modem and telephone line can send and receive unlimited information around the world almost for free.

One of the banks spent millions of dollars on new computer hardware, only to find subsequently that only one software program ran on it.

To function at all, a computer needs an **operating system**

program. Some operating systems require users to type in **commands** to tell the computer what they want to do.

Many computers use a **graphical interface or point-and-click interface** such as Windows. **Icons** are symbols representing the different peripherals, programs, and files. Functions are activated by selecting a particular icon with the mouse.

Some interfaces allow **plug-and-play**, the possibility of connecting new hardware to the computer without having to adjust or configure the system to take the new hardware into account: the interface program recognises the hardware automatically.

The quality of the operating system determines how useful the computer is. The more effective it is, the more programs it can run at once and the more efficiently it uses the finite resources of the processor. ...Microsoft, the company that gave the world the ubiquitous Windows graphical interface. Windows popularised the mouse-driven point-and-click interface first seen on the Apple Macintosh.

Files and programs are arranged into icons so that the user can see at a glance what files are available and what programs are running.

PC games required users to enter complicated DOS commands to configure audio, video and graphics cards. The newly claimed 'plug and play' capability for Windows 95 stems from a new collection of Microsoft programs called DirectX that solves the memory problems of previous Windows versions.

Word list

monitor

screen

VDU =

= visual display unit

keyboard

mouse

printer

scanner

modem

peripherals

hardware

operating system

command

configure

graphical interface

point-and-click interface

icon

plug-and-play

Exercise 1

Read the text and decide whether these statements are true or false

- 1 Data is usually entered into a computer with a help of a screen pointing device, the so called a mouse.
- 2 A device used for a computer connection to other computers via telephone lines is a modem.
- 3 A monitor, a keyboard, a mouse, a printer, a scanner peripherals.
- 4 Physical, electronic, electromechanical devices that are recognized as “computers” refer to as hardware.
- 5 Unfortunately limited information can be received and sent with a computer, modem and telephone line.
- 6 A computer can’t function without an operating system program the quality of which shows the usefulness of a computer.
- 7 The Apple company gave the users of computers the ubiquitous Windows graphical interface.

- 8 Not many computers use a graphical interface or point-and-click interface such as Windows.
- 9 Icons are symbols of files and programs and activated with the mouse, so that the user can see what files are available and what programs are running.
- 10 Plug-and-play capability for Windows 95 is from Microsoft new programs to solve the memory problems of Windows versions.

Exercise 2

Please find in the text the terms defining the following:

- 1 a screen pointing device;
- 2 a device for connecting a computer via telephone lines to other computers;
- 3 the physical machinery of computers;
- 4 optical devices which can copy text into DTP documents;
- 5 a program a computer need to function;
- 6 symbols that represent the different peripherals, programs, files;
- 7 the possibility of connecting new hardware to the computer without having to adjust or configure the system;
- 8 the newly claimed capability of Windows 95 to solve the memory problems of previous Windows versions.

Exercise 3

Answer the following questions

- 1 What are peripherals?
- 2 Is only hardware necessary to make up a computer system?
- 3 Does software alone constitute a computer system?
- 4 Does a computer system imply a good mixture of parts working together?
- 5 Is system software usually referred to as programs?
- 6 How can we determine the computer is effective enough?
- 7 What kind of computers new capabilities do the famous computer companies suggest?

Exercise 4

Find in the text the passage, describing interface, and put it into Russian language.

Exercise 5

The word 'keyboard' has been omitted four times and the word 'keyboards' three times from this *New Scientist* article. Where do they go?

Qwerty Continuity

...The standard that was invented in 1872 is known worldwide as QWERTY after the first six letters of the top line of letter keys. The American naturalist Stephen Jay Gould relates that the characters on the QWERTY were deliberately set to be inconvenient, thus ensuring slower typing speeds.

The reason was simple. Typists using the earliest mechanical typewriters could reach such high speeds that the keys were frequently jamming.

Subsequently, as Gould puts it, by some strange 'technological continuity law', the QWERTY survived into the age of electronic, despite the fact that the jamming problem was no longer relevant.

All recent attempts to create a mass market for more efficient, for example the Dvorak, on which typists can achieve touch typing speeds about 40 per cent faster than on QWERTY, were blocked. ...

Unit 4

Software

A set of instructions telling a computer what to do is a **program**. People who **program** computers are **programmers**. What they do is **programming**.

Programs are **software**. Programming is often referred to as **software development** or **software engineering** and programmers as **software developers** or **software engineers**.

Friedel does not think that a program running on a single PC will ever be able to reach the level of a good chess grandmaster in tournament play. Attempts to program a computer to integrate gesture with speech began back in the 1970s at the Massachusetts Institute of Technology Architecture Machine Lab. When programmers are writing software, they can test how easy it is to use on 'models', programs which make the same mistakes as human operators.

Mr. Gates's boyhood pastime was computer programming. Today Microsoft, his company, is the world's most successful supplier of computer software.

India has the software skills and thousands of software developers who are English-speaking and technically proficient.

IBM has invested billions in software development but has yet to make headway in high-growth markets for personal computer software, where Microsoft dominates. Can developers of complex systems avoid using formal specifications and proofs? The question software engineers should be asking about formal methods is not whether to use them, but how best to benefit from them as part of a complete software engineering approach.

Programmed instructions are referred to in general as **code**.

Programs are usually written in a programming **language** like Fortran or Pascal. This is the **source code**, which is then translated into a form the machine can recognize: **machine code**.

An **algorithm** is a series of logical or mathematical steps represented in a program.

Object-oriented programs consist of ready-made blocks and make line-by-line programming unnecessary.

Programs and the data they deal with are organized into **files**.

Windows 95 consists of millions more lines of program code than its predecessor, Windows 3.1. For the machine to be programmed in a standard engineering language like Fortran, the company had to write a piece of software called a Fortran compiler to translate the standard commands of Fortran into the binary 'machine code' that actually controls the machine's circuitry. Illegal in most industrial countries, decompilation turns the strings of noughts and ones that a computer understands back into the English-language statements ('source code') made by the original programmer.

We have achieved such high speeds through very compact coding, and some algorithms.

Object-oriented programming, the latest software fashion, is more ambitious still. It allows 'objects', whether mathematical procedures, chunks of data or video images, to be defined once and then used endlessly. The full-screen colour picture came from a computer file of 100 kilobytes.

Programs for specific tasks are **applications**.

Applications include:

database software allowing information to be stored, added to, sorted, and analysed. **spreadsheets** for calculations to be performed on numbers presented in rows and columns, for example in financial forecasting.

wordprocessing on a **wordprocessor** that permits texts to be entered, checked, changed, and printed. **Desktop publishing** or **DTP** takes this one step further by allowing the production of attractive documents of near-professional quality.

Vital applications that have great commercial success are **killer applications** or **killer apps**.

New software that is announced, but that appears late or not at all is, informally, **vapourware** or **vaporware** (in American English).

In the 1980s the firm's applications for its own operating system sold poorly. Lotus, WordPerfect and Borland became the leading suppliers of (respectively) spreadsheets, word-processors and database software. Wedded to his word-processing machines, Wang refused employees' pleas to launch general-purpose personal computers, as arch-rival IBM was doing.

The spread of desktop publishing means many students now work on exactly the same Quark Express software as the professionals. Most PC users who want a word processor, spreadsheet or database already have one. And there are no new 'killer apps', industry jargon for top-selling programs, on the horizon.

Microsoft has become a world leader in 'vapourware', new software announced long before it is ready for market, then delayed for months as the company eliminates bugs and changes specifications.

Word list

program
programmer
programming
software
software developer
software development
software engineer
software engineering
language
code

machine code
source code
algorithm
object-oriented
file
application
killer app =
= killer application
database
desktop publishing =
= DTP
spreadsheet
wordprocessing
wordprocessor
vapourware

Exercise 1

- 1 Skim the text to understand what it is about.
- 2 Find in the text passages, describing what software is and translate them into Russian language.
- 3 Find in the text and put down the key-words to speak about codes, algorithms, object-oriented programs, applications.
- 4 Write the summary of the text in Russian

Exercise 2

Complete the statements choosing the variant corresponding to the contents of the text:

- 1 Programs are:
 - a) software;
 - b) application software;
 - c) software engineering approach
- 2 Programming is:
 - a) instructions;

- b) software development;
- c) software engineering;
- 3 Code is:
 - a) machine code;
 - b) programmed instructions;
 - c) English-language statements
- 4 Programming language is:
 - a) instructions;
 - b) source code;
 - c) machine code;

Exercise 3

Choose the statements which correspond to the content of the text:

- 1 Software is the programs usually written to direct the computer to perform the tasks.
- 2 Today IBM and Microsoft are the world's most successful suppliers of computer software.
- 3 IBM has invested billions in software development and has made headway in high-growth market for PC software where Microsoft dominates.
- 4 Object-oriented programs are the latest software product that makes line-by-line programming unnecessary.
- 5 Application software is provided as part of a computer product designed to meet a specific need in certain areas.
- 6 Algorithm is a series of logical or mathematical steps represented in a program to achieve very high speeds.
- 7 Programming language is called the source code which is translated into a form the machine can recognize, machine code to control the machine's circuitry.
- 8 The main functions of a wordprocessor are to enter; to check; to change and print texts.

- 9 Vapourware is new software announced by Microsoft company, the world leader in the software market.

Exercise 4

Find these words in the text:

- killer application
- spreadsheet
- file
- vapourware
- object-oriented programs

What do they mean?

Exercise 5

Read the text once more and answer the following questions:

- 1 What is programming?
- 2 Is there a difference between software engineers and software developers?
- 3 What are programmed instructions referred to?
- 4 What do applications include? Why do computer users need them?
- 5 What kind of applications are called killer applications?
- 6 What is a code?

Exercise 6

Discuss the following with your partner

- 1 What is software? What is it usually referred to?
- 2 Why do computer users need software?
- 3 Why is a computer system considered to be incomplete without software?
- 4 What two broad categories can computer software be divided into? What is the difference between them?

Exercise 7

Complete each gap with a different key word or expression from this unit

- 1 The data is automatically forwarded every 24 hours to a hospital computer, which is _____ to interpret the results and decide whether human health workers should be alerted to a possible problem.
- 2 Developing a snake-like robot took more than simply stringing a lot of joints together. Most robots, the ones that paint and weld cars or fit computer chips into memory boards, have six joints at most. The computer _____s needed to control them would require massive computer power if extrapolated to 30 joints.
- 3 The astronomers plan to use a technique known as _____ programming. This arranges the software in modular blocks so that it is easier to modify or upgrade.
- 4 Mobile information is 'dissolving space and time', he says, citing as an example a company that writes software around the clock, using _____s in different time-zones.
- 5 Publishers will have to rethink their methods of enforcing copyright because of the ease of copying computer _____s.
- 6 At midnight on 31 December 1999, thousands of computer systems around the world are in for a shock. Their internal calendars will click from 99 to 00, which their software will interpret as 1900. The 1999 problem is a particular threat to systems written in the 1970s for mainframe computers with the COBOL programming _____, which recognises only two-digit dates.

Exercise 8

Complete this article from *The Economist* using the listed words, (a occurs three times, b once, c twice, and d seven times.)

- a code
- b programs
- c programmers
- d software

Made to Measure: Cost – Effective Software Engineering

Once upon a time, most software was little more than a few hundred lines of code dreamt up in a computer nerd's spare bedroom; Tim Paterson, who developed the first version of Microsoft's MS-DOS operating-system software, carried its code around in his head. These days _____ (1) is rather more complex. A typical word-processing _____ (2) package for a personal computer contains 500,000 lines of _____ (3). Transforming Windows into Windows-NT meant writing 1 million lines of new computer _____ (4).

Such computer codes are not just written; they are 'engineered'. Developing complex _____ (5) is both labour- intensive and time-consuming.

A modern PC spreadsheet might take 20 _____ (6) two years to develop. ...

As well as paying \$10 billion each year for PC _____ (7) packages, American companies also spend up to \$20 billion on customised _____ (8) for everything from payrolls to production lines, with no easy way of knowing whether they are getting value for money. The traditional way of counting cost-effectiveness in _____ (9), working out each program's cost per line of code, works when comparing two _____ (10) written in the same language.

But try to compare two _____ (11) projects written in different languages - there are now over 400 - and the technique falls apart. Source codes (what _____ (12) actually write) have to be translated into machine codes (something simple enough for a

computer to understand) before anything useful can happen.

A line of _____ (13) in a modern 'high-level' language such as 'C' can contain ten or more times as much machine-code meaning as a line of Assembler (which is just one step from machine code). Some of the latest computer languages based on graphical icons are 70 times more powerful than Assembler. ...

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STARTING COMPUTERS AND IT

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