**Министерство образования и науки Российской Федерации**

**Калужский филиал федерального государственного бюджетного образовательного**

**учреждения высшего профессионального образования**

**«Московский государственный технический университет имени Н.Э. Баумана»**

**(КФ МГТУ им. Н.Э.Баумана)**

**Кафедра лингвистики СЭ5-КФ**

**ЖУРАВЛЕВА И.В.**

**Учебный практикум**

**«Информационные технологии»**

**по курсу иностранного (английского) языка**

**для студентов 3 курса по направлению подготовки бакалавров «Программная инженерия»**

**(5-й семестр)**

Под редакцией Бойко В.В.

Калуга, 2014

УДК 42

ББК 74.261.7 Англ.

Ж 91

Данный учебный практикум «Информационные технологии» для студентов по направлению подготовки бакалавров 09.03.04 «Программная инженерия» разработан в соответствии с методическим планом работы секции английского языка кафедры «Лингвистика» КФ МГТУ им. Н.Э. Баумана.

Учебный практикум «Информационные технологии» по направлению подготовки бакалавров «Программная инженерия» рассмотрен и одобрен:

кафедрой "Лингвистика" (СЭ5-КФ)

" \_\_\_\_ " \_\_\_\_\_\_\_\_\_ 2014 г.

Протокол № \_\_\_

Зав. кафедрой СЭ5- КФ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Н.К. Власко

Методической комиссией факультета СЭК

" \_\_\_\_ " \_\_\_\_\_\_\_\_\_ 2014 г.

Протокол № \_\_\_

Председатель методической комиссии \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ О.А. Артеменко

Методической комиссией Калужского филиала МГТУ им. Н.Э. Баумана

" \_\_\_\_ " \_\_\_\_\_\_\_\_\_ 2014 г.

Протокол № \_\_\_

Председатель методической комиссии\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ О.Л. Перерва

Рецензенты: д.ф-м.н., профессор,

зав.кафедрой ФН-1 КФ

Б.М. Логинов

канд.пед.наук, доцент

кафедры «Английского языка»

КГУ им. К.Э. Циолковского

С.Д. Концевова

Автор: ст.преподаватель

кафедры «Лингвистика» СЭ5-КФ

И.В. Журавлева

Настоящий учебный практикум «Информационные технологии» предназначен для студентов по направлению подготовки бакалавров 09.03.04 «Программная инженерия». Его цель – совершенствование навыков чтения иноязычной литературы (английский язык) по данному направлению подготовки. Задания настоящего практикума предполагают аудиторные занятия студентов под контролем и при участии преподавателя. Возможна также самостоятельная внеаудиторная работа студентов.

Калужский филиал МГТУ им. Н.Э. Баумана, 2014 г.

Журавлева И.В., 2014 год.

**ВВЕДЕНИЕ**

Целью данного учебного практикума является совершенствование умений и навыков ознакомительного и изучающего чтения английских аутентичных текстов по направлению подготовки бакалавров 09.03.04 «Программная инженерия». Практикум предназначен для занятий студентов данного направления подготовки бакалавров в 5 семестре. При составлении данного учебного практикума были использованы фрагменты статей из английских научных журналов из области информационных технологий.

Задания данного учебного практикума предусматривают:

* закрепление типичных для английского языка грамматических структур;
* усвоение терминологической лексики данной области специализации;
* выделение основных трудностей перевода терминологии научно-технических текстов из области информационных технологий;
* обучение аннотированию и реферированию.

Работу с текстами данного учебного практикума предпочтительнее проводить в аудитории под руководством преподавателя, но возможно её выполнение и внеаудиторно.

Выполнение в аудитории заданий на перевод, подстановку пропущенных вместо точек терминов, подбор определения к термину осуществляется в устной или в письменной форме по рекомендации преподавателя. Если работа выполняется внеаудиторно, то все эти задания предпочтительно выполнить в письменной форме.

Учебный практикум составлен с учетом новейших технологий компьютерной сферы на сегодняшний день. Актуальность данного учебного практикума обусловлена повышением значимости владения иностранным языком в качестве средства обмена и распространения информации в мировом научном сообществе.

**Содержание**

стр.

Введение………………………………………………………………………………3

Unit 1. Сomputer and its components …………………………………….….............. 5

Unit 2. Software development…………….……….……………………………….....12

Unit 3. Internet …………………………………………………..…………………… 19

Приложение…………………………………………………………………………....26

Список литературы………………………………………………………………… ...33

**UNIT 1**

**I. Answer these questions:**

1. What types of computers do you know?
2. What type of computer do you prefer to work on?
3. Do you like to improve certain parameters of your own computer? If so, which ones? If not, why?
4. Which computer programs do you use?
5. Are you longing for brand new programs, or you’re a conservative who prefers to use well-known, old and reliable ones?

**II. Make sure that you know the following words:**

Floppy disk, digital computer, analog computer, microcomputer, transportable

computer, mainframes, hardware, software, application program, to execute

program instructions, to control the operation, central processing unit (CPU),

to carry out calculations, random access memory (RAM), to run simultaneously,

to be volatile, read-only memory (ROM), to boot the computer.

**III. Read and translate the text:**

**СOMPUTER AND ITS COMPONENTS**

Computeris a programmableelectronic machine that processes data and performs calculations and other symbol-manipulation tasks. It cantake information from a person through the keyboard or mouse, from a device like CD or floppy disk or from the network through a modem. There are three types of machines: the digital computer, which manipulates information coded as binary numbers; the analog computer, which works with continuously varying quantities; and the hybrid computer, which has characteristics of both analog and digital computers.

*Digital computers* are widely spread and corresponding to their size and intended use they could be divided into four types.

*Microcomputers* are the smallest used in small business, at home, and in schools. They are usually single-user machines.

*Laptop* is a transportable computer, the best partner of yours when going somewhere on business, particularly in conferences, talks, etc.

*Mainframes* which can often service several hundred users simultaneously, are found in large organizations, such as national companies and government departments.

*Supercomputers* are mostly used for extremely complex scientific tasks, such as analyzing the results of nuclear physics experiments and weather forecasting. The mechanical, electrical and electronic components of a computer system is called *hardware.*

A collection of programs and procedures for making a computer perform a specific task is called software. *Software* is created by programmers and is either distributed on a suitable medium, such as a *floppy disk*, built into the computer in the form of firmware. Examples of software include operating system, compilers and application programs. No computer can function without some form of software.

The main component of a computer that executes individual program instructions and controls the operation of other parts is the central processing unit (*CPU*). It includes the arithmetic and logic unit that carries out all calculations and logical operations, and control unit, which helps to run information around the system, since it decodes, synchronizes and executes program instruction.

The next important component of a computer is called random access memory or *RAM*. The memory is considered “random access’ because the memory locations can be accessed directly rather than requiring sequential access. It means that the data can be selected without having to skip over earlier data first. The CPU must load application programs and the data they need into RAM before they can perform any processing. RAM is always supplemented by virtual memory, which increases the number of applications that can be run simultaneously.

Virtual memory-space on a hard disc used to temporarily store data and swap it in and out of RAM as needed.

RAM is the short-term memory of the computer. It is volatile, which means that any information stored in it will be lost if power goes out.

A permanent type of memory storage used by the computer for important data that

does not change is called read-only memory (*ROM*). It does not lose its components when power is removed. ROM contains programs that are critical to the operation of the computer, for example, the instructions necessary to boot the computer when it is turned on.

*BIOS* (basic input/output system) is a type of ROM that is used by the computer to establish basic communication when the computer is turned on.

*Cash* is a special memory subsystem within a computer that temporarily holds data or program instructions to improve overall computer performance. Most cashes copy data or from a standard computer memory (RAM) to a type of memory that allows faster data access by the CPU.

**IV. Match the terms in the left-hand column with their definitions in the right-hand column.**

|  |  |
| --- | --- |
| 1. digital computer | 1. a device that executes individual program instructions and controls the operations of other parts of the computer |
| 2. software | 2. a hard disc on which data is stored in the form of etched pits |
| 3. hardware | 3. a program that controls a peripheral device |
| 4. scanner | 4. a device, which manipulates information coded as binary numbers |
| 5. driver program | 5. visual display terminal |
| 6. CPU | 6. a collection of programs |
| 7. VDT | 7. the mechanical, electrical and electronic components of a computer system |
| 8. floppy disk | 8. a device for copying texts and pictures |
| 9. CD ROM | 9. a flexible disk, a storage device on which data is recorded magnetically |
| 10. DDT | 10. a software error or flaw |
| 11. bug | 11. debugging program |
| 12. RAM | 12. a permanent type of memory storage for important data that does not change |
| 13. ROM | 13. short-term memory |

**V. Give full answers to these questions:**

1. What is a computer?
2. How can it take information from a person?
3. What types of computers are mentioned in the text?
4. What type of computer is used by every dignified businessman?
5. What types of computers are used for complex scientific tasks?
6. What is the difference between software and hardware?
7. What does the CPU mean?
8. What are the main components of a computer?

**VI. Retell the text briefly using the following words and expressions:**

Programmable electronic machine, process data, digital computer, analog computer, hybrid computer, microcomputers, laptops, mainfraimes, supercomputers, hardware, software, central processing unit, immediate access memory, volatile, read-only memory, to boot the computer.

**VII. Fill in the gaps with the missing prepositions. Help yourself referring to text.**

1. The hybrid computer has characteristics … both analog and digital computers.
2. Microcomputers are used … small businesses, …home and … schools.
3. Supercomputers are mostly used ...complex scientific tasks.
4. Software is created … programmers.
5. Software is either distributed … a suitable medium or built … the computer.
6. CPU can carry … all calculations and logical operations.
7. Peripheral devices are attached .. a computer.
8. Nonvolatile memory does not lose information even when computer is

switched … .

1. Volatile memory stores programs and data only while the computer is

switched … .

1. Today you can buy a computer according … your taste and needs.

**VIII. Rearrange the words and get the right sentences.**

1. computer / data / and / processes / calculations / performs /.
2. information / can / computer / take / from / a person / through / a modem.
3. several / users / can / mainframes / hundred / service.
4. programs / includes / software / of / a collection.
5. CPU / the main / is / a computer / component / of.
6. carries out / all / logical / it / operations / calculations / and.

**IX. There are two words given in each item. You have to explain in what way they are similar and how they differ from each other.**

1. (a) computer, (b) laptop;
2. (a) floppy disk, (b) hard disk;
3. (a) hardware, (b) software.

**X. Give the opposites of the following words:**

paralyze, late, complex, positive, run, build, spend, cheap, go back, individual, connect, possible, large, volatile, external memory, flexible, tight, formal, foreign.

**XI**. **Give the synonyms of the following words:**

switch on, address, execute, support, purpose, control, connect, perform, create, contain, locate.

**XII. Use the words to complete the sentences.**

*data, simultaneously, transportable, programmers, virtual memory, microcomputers, calculations, floppy disk, executes, goes out, controls, temporarily holds, random access memory*

1. Computer is a programmable electronic machine that processes … and performs … .
2. … are usually single-user machines.
3. Laptop is a … computer, the best partner of yours when going somewhere on business.
4. Mainframes can often service several hundred users … .
5. Software is created by … and is distributed on a suitable medium, such as a … , built into the computer in the form of firmware.
6. The main component of a computer that … individual program instructions and … the operation of other parts is the central processing unit (*CPU*).
7. The next important component of a computer is called … .
8. RAM is supplemented by … , which increases the number of applications that can be run simultaneously.
9. RAM is volatile, which means that any information stored in it will be lost if power … .
10. Cash is a special memory subsystem that … … data or program instructions to improve overall computer performance.

**XIII. Supply the articles where necessary:**

1. … digital computers are widely spread.
2. … main component of … computer is … central processing unit.
3. … CPU includes … arithmetic and … logic units.
4. … control unit helps to run … information around … system.
5. Every of … peripheral devices connected to … computer needs … driver program.
6. … driver insures that … communication between … computer and … peripheral device is successful.
7. … memory is one of … most important components of … computer.
8. Tom bought … new program.
9. It turned out that … program was extremely interesting and useful for him.
10. As … matter of fact all … professionals have their own specific colloquial language.

**XIV. Translate into English**.

1. С моим компьютером что-то произошло; такое впечатление, что он сломался.
2. Трудно представить современного специалиста без компьютера.
3. Память является очень важным элементом компьютера, но не менее важен процессор.
4. Для периферийных устройств необходимы соответствующие драйверы.
5. Компьютер без программного обеспечения является бесполезным металлом.
6. Для длительного хранения информации ее переписывают на дискеты и жесткие диски.
7. Сканеры необходимы в тех случаях, когда требуется копировать тексты или изображения.
8. Драйверы обеспечивают успешную связь компьютера с периферийными устройствами.
9. Для безопасности желательно проинсталлировать надежную антивирусную программу.
10. Вирус может погубить не только полезную информацию, но также и программы.

**XV. Read the text, try to understand the topic and put the items in the right order. Take into account that the first one is in the right position.**

1. A virus is a program that will seek to duplicate itself in memory and on discs, but in a subtle way that will not immediately be noticed.
2. Note also that different platforms have different general levels of resistance. Unix machines are almost immune. Win ’95/’98 /Me is quite vulnerable, and most others lie somewhere in between.
3. Therefore a computer on the same network as an infected computer or that uses an infected disc (floppy or CD) or that downloads and runs an infected program can itself become infected.
4. For example, on a network consisting of a WinTel box, a Mac and a Linux box, if one machine acquires a virus the other two will probably still be safe.
5. A virus can only spread to computers of the same platform.

**XVI. Look through the text. Make a short summary of it:**

**Parameters of computer components**

No doubt, the computer is a very complicated compound device, with particularities and especially all the details of its “activities” are beyond the reach of just an average man in the street, but nevertheless each more or less experienced user who wants to acquire a computer is always interested in parameters of its components, such as motherboard and video board or video adapter. Of course these parameters must depend on the purposes which his computer will be targeted to.

Motherboard is the main circuit board of the computer that all the others internal components connect to. Typically, the motherboard contains the CPU, BIOS, memory, mass storage interfaces, serial and parallel ports expansion slots*,* and all the controllers required to control standard peripheral devices, such as the display screen, keyboard and disc drive. Other circuit boards are called add-ons or expansion boards.

Because the motherboard contains the CPU, all other chips attached to the motherboard can access the CPU directly without going through the bus i.e. through the wires that provide the routes of transmitting data. Hence it is possible to improve the parameters of your computer if you change or add some new chips.

On most PCs, it is possible to replace the motherboard to upgrade to a faster microprocessor. Replacing the motherboard improves performance of all its components in addition to adding a faster CPU. Besides that, by replacing everything at once you can avoid possible compatibility problems.

Video board is located on an expansion board and inserted into a slot in the computer to provide it with the ability to display a video image. The parameters of this device are very important for the multimedia purposes.

Sound card is used by the computer to record and play audio by converting analog sound into digital information and vice versa.

Graphics card translates image data from the computer into a format that can be displayed by the monitor.

SCSI (pronounced “skuzzy”), acronym for small computer system interface. One type of standard interface used to connect computers to devices such as hard discs, printers, scanners and CD-ROM drivers. SCSI interfaces provide for faster data transmission rates than standard serial and parallel ports.

There are several peripheral devices that can be attached to a computer: VDT (visual display terminal) or monitor, the primary device for displaying information from the computer; keyboard, the primary device for entering information into the computer; mouse, the primary device for navigating and interacting with the computer; disc drive units for mass memory storage (e.g. CDs, floppy, etc.), scanners for copying pictures and texts, printers for printed output, and modem (acronym for modulator-demodulator) for connecting to the internet.

**XVII**. **Translate the text in written form:**

**Storage devices**

Immediate access memory or internal memory describes the memory locations that can be addressed directly by the central processing unit. It is either read only or read / write. Read only memory stores information that must be constantly available and is unlikely to be changed. It is nonvolatile. Read / write memory is volatile – it stores programs and data only while the computer is switched on.

External memory (backing storage) is nonvolatile memory located outside the central processing unit, used to store programs and data that are not in current use. It is provided by such devices as magnetic discs – floppy and hard discs or optical disks – CD ROM.

Floppy disc is a storage device consisting of a light flexible disc enclosed in plastic. It is placed in a disk drive, where it rotates at high speed. Data is recorded magnetically on one or both surfaces. Present day average floppy discs hold not more than several megabytes, depending on the disc size, recording method and whether one or both sides are used.

CD ROM (compact disc read- only memory) is a storage device developed from the technology of the audio compact disc. It consists of a plastic coated metal disc, on which binary digital information is etched in the form of microscopic pits. This can then be read optically be passing a light beam over the disc. CD ROMs hold 500-700 megabytes and are used in distributing large amounts of texts and graphics. On CD RWs (read and write disks) it’s possible to rewrite information many times. DVD can hold the amount of information up to several gigabytes.

**UNIT 2**

**I. Make sure that you know the following words:**

Digitally formatted data, to interface the computer, types of input data, to store data, on and off patterns, circuit, numeric value, binary digit, binary code, to convert, to apply, to execute sequentially, to process, time consuming, user-friendly format, computer capabilities, advanced software, accessibility, system software, application software, programming language, operating system, utility software.

**II. Read and translate the text:**

**SOFTWARE DEVELOPMENT**

Although a modern computer is capable of accepting many types of input, it can only operate on digitally formatted data, just as original computers did. Hence software must be created to interface the computer with the various types of input data. Because a computer runs on electricity, data must be stored as a series of on and off patterns.

Computer circuits can be in only one or two states: either on (represented by 1) or off (represented by 0). Each numeric value is known as a binary digit (bit) and unique combinations of those two bits, are what binary code, or machine language, is called. Different patterns in binary code could then be used to represent various input characters. Once data has been converted to binary form, computers would then apply a software program (applications or apps) to the digital input data, sequentially execute the instructions, and successfully process it into information.

Writing software programs in numerical (or digital) format was an immense task for anyone. Therefore, it was necessary to develop software into a more user-friendly format. As programmers developed existing code, new computer capabilities were noticed and the demand for even more advanced software increased. It inspired programmers to develop more software. Thousands of new programs were being written as swiftly as possible and yet the demand continued to increase. Software types typically fall into 2 categories: system software and application software.

System software controls various internal computer activities. Any software that controls such activities will fall into one of three categories: programming language, operating system and utility software.

*Programming languages* are the various methods of writing computer instructions. The instructions adhere to a particular set of protocols for each language. through the years, more than 200 languages have been developed, some of which are quite specialized. Some of the most popular languages include BASIC, COBOL, Pascal, C, C++, Visual Basic. But regardless of which language a program was written in, a computer can only process binary code. Therefore, each language must eventually be converted back to binary code before any instructions can be followed.

High-level languages were developed for two reasons: one – so programmers could work on different computers without having to learn a new assembly language each time, and software written on one computer could be used by another. A compiler (program translator) was used to help solve these problems by translating a program into machine language and checking the program for syntax errors.

Until 1970, IBM bundled its software with its computers, selling the hardware along with the software needed to run it. IBM began charging a separate fee for its software, thus opening a market for independent software developers to write programs that would run on IBM machines. By the time the first personal computer (PC), called the Altair hit the market in the 1975, there were many well-developed computer languages and competent programmers available to write software for the new industry.

*Operating systems* have become larger and more sophisticated in response to the capabilities of new hardware and other software. CP/M developed by Gary Kildall in 1973 for Intel Corporation, was the first OS that would run on PCs made by different manufacturers, and it had the largest number of programs for data and word processing and calculations. Although it was a powerful operating system, few software developers supported it, referring to write for the growing DOS-based market.

*Utility* software expands the performance of the operating system by adding functions that are not part of the original OS. Utilities perform troubleshooting jobs, inspecting diskettes for damage, file conversion, defragmenting, data compression and file spooling. Some utility programs, such as Symantec’s Norton Utilities, even retrieve data from damaged disks. Utilities can also be used to customize the OS environment.

**III. Match the terms in the left-hand column with their definitions in the right-**

**hand column**.

|  |  |
| --- | --- |
| 1. primary | 1.grow wider or bigger |
| 2.definition | 2.put a limit on |
| 3.expand | 3.at last, finally |
| 4.consume | 4.make (a book etc) from information that has been collected |
| 5.restrict | 5.chief |
| 6.eventually | 6.make it possible for |
| 7.compile | 7.use up |
| 8.flexible | 8.precise statement or explanation |
| 9.enable | 9.follow |
| 10.track | 10.easily bent |

**IV. Answer the following questions:**

1. Why was software created? What was the reason?
2. How must data be stored in a computer?
3. What does the “binary digit” mean?
4. Why does the unceasing demand for more advanced software exist?
5. What does the notion “programming language” mean? Can you give any examples?
6. What do you know about high-level languages?
7. What is compiler used for?
8. What do you know about OS?
9. What kind of OS do you prefer to use? And why?
10. Why do we need utilities?

**V. Retell the text briefly using the following expressions:**

Although a modern computer is capable of accepting many types of input, it can only operate on digitally formatted data, just as original computers did. Hence software must be created to interface the computer with input data. Because a computer runs on electricity, data must be stored as a series of on and off patterns.

Computer circuits can be in only one or two states: either on (represented by 1) or off (represented by 0).

Writing software programs in numerical (or digital) format was an immense task for anyone. Therefore, it was necessary to develop software into a more user-friendly format

System software controls various internal computer activities.

*Programming languages* are the various methods of writing computer instructions. The instructions adhere to a particular set of protocols for each language.

High-level languages were developed for two reasons: one – so programmers could work on different computers without having to learn a new assembly language each time, and software written on one computer could be used by another.

*Operating systems* have become larger and more sophisticated in response to the capabilities of new hardware and other software.

*Utility* software expands the performance of the operating system by adding functions that are not part of the original OS. Utilities perform troubleshooting jobs, inspecting diskettes for damage, file conversion, defragmenting, data compression and file spooling.

**VI. Fill in the gaps with the missing words from the text. Mind that in each item the first letter of the word is used:**

1. At first, numbers were the primary form of c… d… .
2. Software must be created to i… the computer with input d… .
3. Each numeric value is called b… d… .
4. System software c… internal computer activities.
5. Because of h… l… l … programmers could work on different computers without having to learn a new a… language each time.
6. The o… s… is a group of programs that help computer to interpret commands, p … the inputs and outputs, and manage data.
7. Utility and application software expand the p… of OS.

**VII. Rearrange the words and get the right sentences**:

1. states / of two / computer / can / in only / be / circuits / one.

2. a user-friendly / it / to develop / format / into / necessary / software / was.

3. it/ to develop / more / inspired / software / programmers.

1. software / computer / written / could / be / on / used / on / one / another.
2. controls / system / various / software / activities / internal.
3. instructions / are / the / programming / various / computer / methods / of / languages / writing.
4. must / each / converted / be / binary / language / to / back / code.
5. have / operating / larger / become / and / more / systems / sophisticated.

**VIII. Supply the missing preposition. Refer to the text if necessary**.

1. Modern computer operates … digitally formatted data.
2. A computer runs … electricity.
3. Computer circuits can be only … two states.
4. The early days of computing were restricted … science applications.
5. It increased the demand … more advanced software.
6. OS is a group of programs that help … the operation … a computer.
7. CP / M was the first OS that could run … Cs made … different manufacturers.
8. Utilities inspect diskettes … damage.

**IX. There are two words given in each item. You have to explain in what way they**

**are similar and how they differ from each other.**

1. (a) first computers, (b) modern computers;
2. (a) OS, (b) utility;
3. (a) utility, (b) apps.

**X. Give the opposites of the following words:**

input; quickly; modern; fill; notice; internal; specific; separate; high; independent; competent; add; insert; early; possible.

**XI**. **Give the synonyms of the following words:**

modern; accept; realize; increase; restrict; general; swiftly; various; particular; error; memorize; competent; competent; entire.

**XII.** **Replace the italicized word combinations by appropriate ones given in the**

**list below**. **Some of them might be used more** **than once. Refer to a** **dictionary if necessary.**

*Appear in ; at first; contemporary;**dealing with errors and problems; desire; encourage; examine carefully and select; increase; not cease; payment; quickly; tremendous; understand*.

1. ***In the beginning***, computers used numbers as the primary form of input data.
2. A ***modern*** computer is capable of accepting many types of input.
3. Engineers quickly ***realized*** that writing in binary code was extremely difficult.
4. Writing software programs in numerical format was an ***immense*** task for anyone.
5. It ***inspired*** programmers to develop more software.
6. IBM began charging a separate ***fee*** for its software.
7. IBM chose DOS as its operating system, and when its open-architecture PC ***hit*** the market, programmers ***jumped at the chance*** to write application software for it.
8. Utilities perform ***troubleshooting*** jobs, inspecting diskettes for damage.

**XIII. Translate into English.**

1. Хотя современный компьютер способен принимать много типов входных данных, он может работать только с цифровыми данными.
2. Следовательно, программное обеспечение должно быть создано, чтобы обеспечить связь компьютера с разными типами входных данных.
3. В начале своего развития использование компьютеров ограничивалось научными и инженерными применениями.
4. Инженеры быстро поняли, что написание программы в двоичном коде было чрезвычайно трудным и утомительным делом.
5. До 1970 года IBM ориентировало программное обеспечение на различные компьютеры и продавало их в комплекте.
6. К тому моменту, когда первый персональный компьютер появился на рынке, существовали хорошо развитые компьютерные языки и грамотные программисты способные создать новые программы.
7. При включении компьютера операционная система загружается автоматически и может активизировать другие программы.
8. Утилиты расширяют возможности операционной системы, добавляя ей дополнительные функции.

**XIV. Read the text, try to understand the topic and put the items in the right order. The first item and the last one are in the right position.**

1. An OCR (Optical Character Recognition) system enables you to input printed documents into your computer automatically via a scanner.

FineReader is an omnifont optical text recognition system. It means that the system recognizes texts in practically any font without prior training. The process of document can be divided into two stages:

1. The principles of IPA (Integrity, Purposefulness, Adaptivity):

* Integrity – the object of recognition is described as a single entity by set of basic elements and their interrelations.
* Purposefulness – recognition is a process of generation and purposeful verification of hypotheses.
* Adaptivity – the system ability to learn and to be trained.

1. Let’s take a closer look at the second of two mentioned above stages.

FineReader OCR image processing involves analyzing the image file transmitted by the scanner (layout analysis) and recognizing each character.

1. These three principles determine the systems behavior. The system generates a hypothesis about object of recognition and then tries to find all the structural elements and their interrelations step by step. Then the program adapts itself to the text – tunes itself - using the positive experience gained from the first confidently recognized characters. Purposeful searching and using context enable the system to recognize even torn and distorted characters.
2. The final result is the recognized text you see in the FineReader window, a text you can edit save in any convenient format.
3. These two stages are:

*Scanning*. During the first stage the scanner acts as the “eye” of your computer, it looks at the image and transfers it into the computer.

*Recognition*. During the second stage FineRider performs the OCR image processing.

**XV. Look through the text. Make a short summary of it.**

[**UNIX**](http://en.wikipedia.org/wiki/Unix)

The [Unix](http://en.wikipedia.org/wiki/Unix) operating system was conceived and implemented in 1969 at [AT&T](http://en.wikipedia.org/wiki/AT%26T)'s [Bell Laboratories](http://en.wikipedia.org/wiki/Bell_Laboratories) in the United States by [Ken Thompson](http://en.wikipedia.org/wiki/Ken_Thompson), [Dennis Ritchie](http://en.wikipedia.org/wiki/Dennis_Ritchie), [Douglas McIlroy](http://en.wikipedia.org/wiki/Douglas_McIlroy), and [Joe Ossanna](http://en.wikipedia.org/wiki/Joe_Ossanna). It was first released in 1971, and initially, was written entirely in [assembly language](http://en.wikipedia.org/wiki/Assembly_language), a common practice at the time. Later, in a key pioneering approach in 1973, Unix was rewritten in the programming language [C](http://en.wikipedia.org/wiki/C_(programming_language)) by [Dennis Ritchie](http://en.wikipedia.org/wiki/Dennis_Ritchie) (with exceptions to the kernel and I/O). The availability of an operating system written in a high-level language allowed easier [portability](http://en.wikipedia.org/wiki/Porting) to different computer platforms.

With AT&T being required to license the operating system's source code to anyone who asked (due to an earlier antitrust case forbidding them from entering the computer business), Unix grew quickly and became widely adopted by academic institutions and businesses. In 1984, AT&T divested itself of Bell Labs. Free of the legal obligation requiring free licensing, Bell Labs began selling Unix as a [proprietary](http://en.wikipedia.org/wiki/Proprietary_software) product.

The [GNU Project](http://en.wikipedia.org/wiki/GNU_Project), started in 1983 by [Richard Stallman](http://en.wikipedia.org/wiki/Richard_Stallman), had the goal of creating a "complete Unix-compatible software system" composed entirely of [free software](http://en.wikipedia.org/wiki/Free_software). Work began in 1984. Later, in 1985, Stallman started the Free Software Foundation and wrote the [GNU General Public License](http://en.wikipedia.org/wiki/GNU_General_Public_License) (GNU GPL) in 1989. By the early 1990s, many of the programs required in an operating system (such as libraries, [compilers](http://en.wikipedia.org/wiki/Compiler), [text editors](http://en.wikipedia.org/wiki/Text_editor), a [Unix shell](http://en.wikipedia.org/wiki/Unix_shell), and a [windowing system](http://en.wikipedia.org/wiki/Windowing_system)) were completed, although low-level elements such as [device drivers](http://en.wikipedia.org/wiki/Device_driver), [daemons](http://en.wikipedia.org/wiki/Daemon_(computer_software)), and the [kernel](http://en.wikipedia.org/wiki/Kernel_(computer_science)) were stalled and incomplete.

Linus Torvalds has said that if the [GNU kernel](http://en.wikipedia.org/wiki/GNU_kernel) had been available at the time (1991), he would not have decided to write his own.

Although not released until 1992 due to [legal complications](http://en.wikipedia.org/wiki/Berkeley_Software_Distribution#Net.2F2_and_legal_troubles), development of [386BSD](http://en.wikipedia.org/wiki/386BSD), from which [NetBSD](http://en.wikipedia.org/wiki/NetBSD), [OpenBSD](http://en.wikipedia.org/wiki/OpenBSD) and [FreeBSD](http://en.wikipedia.org/wiki/FreeBSD) descended, predated that of Linux. Linus Torvalds has said that if 386BSD had been available at the time, he probably would not have created Linux.

Torvalds began the development of the Linux kernel on MINIX, and applications written for MINIX were also used on Linux. Later, Linux matured and further Linux kernel development took place on Linux systems. GNU applications also replaced all MINIX components, because it was advantageous to use the freely available code from the GNU Project with the fledgling operating system; code licensed under the GNU GPL can be reused in other projects as long as they also are released under the same or a compatible license. Torvalds initiated a switch from his original license, which prohibited commercial redistribution, to the GNU GPL. Developers worked to integrate GNU components with the Linux kernel, making a fully functional and free operating system.

**XVI. Translate the text in written form.**

**C# (C Sharp programming language)**

C# is a [multi-paradigm programming language](http://en.wikipedia.org/wiki/Multi-paradigm_programming_language) encompassing [strong typing](http://en.wikipedia.org/wiki/Strong_typing), [imperative](http://en.wikipedia.org/wiki/Imperative_programming), [declarative](http://en.wikipedia.org/wiki/Declarative_programming), [functional](http://en.wikipedia.org/wiki/Functional_programming), [generic](http://en.wikipedia.org/wiki/Generic_programming), [object-oriented](http://en.wikipedia.org/wiki/Object-oriented_programming) ([class](http://en.wikipedia.org/wiki/Class_(computer_science))-based), and [component-oriented](http://en.wikipedia.org/wiki/Component-based_software_engineering) programming disciplines. It was developed by [Microsoft](http://en.wikipedia.org/wiki/Microsoft) within its [.NET](http://en.wikipedia.org/wiki/.NET_Framework) initiative and later approved as a standard by [Ecma](http://en.wikipedia.org/wiki/Ecma_International) (ECMA-334) and [ISO](http://en.wikipedia.org/wiki/International_Organization_for_Standardization) (ISO/IEC 23270:2006). C# is one of the programming languages designed for the [Common Language Infrastructure](http://en.wikipedia.org/wiki/Common_Language_Infrastructure). C# is built on the syntax and semantics of [C++](http://en.wikipedia.org/wiki/C%2B%2B), allowing C programmers to take advantage of .NET and the common language runtime. C# is intended to be a simple, modern, general-purpose, object-oriented programming language. Its development team is led by [Anders Hejlsberg](http://en.wikipedia.org/wiki/Anders_Hejlsberg). The most recent version is C# 5.0, which was released on August 15, 2012.

The ECMA standard lists these design goals for C#:

* The C# language is intended to be a simple, modern, general-purpose, [object-oriented programming](http://en.wikipedia.org/wiki/Object-oriented_programming) language.
* The language, and implementations thereof, should provide support for software engineering principles such as [strong type](http://en.wikipedia.org/wiki/Strong_type) checking, array [bounds checking](http://en.wikipedia.org/wiki/Bounds_checking), detection of attempts to use [uninitialized variables](http://en.wikipedia.org/wiki/Uninitialized_variable), and automatic [garbage collection](http://en.wikipedia.org/wiki/Garbage_collection_(computer_science)). Software robustness, durability, and programmer productivity are important.
* The language is intended for use in developing [software components](http://en.wikipedia.org/wiki/Software_components) suitable for deployment in distributed environments.
* Source code portability is very important, as is programmer portability, especially for those programmers already familiar with [C](http://en.wikipedia.org/wiki/C_(programming_language)) and [C++](http://en.wikipedia.org/wiki/C%2B%2B_(programming_language)).
* Support for [internationalization](http://en.wikipedia.org/wiki/Internationalization_and_localization) is very important.
* C# is intended to be suitable for writing applications for both hosted and [embedded systems](http://en.wikipedia.org/wiki/Embedded_system), ranging from the very large that use sophisticated [operating systems](http://en.wikipedia.org/wiki/Operating_system), down to the very small having dedicated functions.
* Although C# applications are intended to be economical with regard to memory and [processing power](http://en.wikipedia.org/wiki/Processing_power) requirements, the language was not intended to compete directly on performance and size with C or assembly language.

**UNIT III**

1. **Make sure that you know the following words:**

To communicate, to share information, computer network, to interact, LAN, WAN, modem, server, workstation, mainframe, to handle, desktop system, explosion, e-mail, file transfer, domain name, internet address, login, identification, indispensable, disperse, joint venture.

**II**. **Read and translate the text.**

**INTERNET**

People always wanted to communicate and share information. That was the main reason for the development of computer network.

*Computer network* is a group of computers that can interact by means of a shared communication link. There are two types of network:

* *Local area network (LAN)* is a network where computers are connected together directly, usually by cable. It is used in offices etc.
* *Wide area network (WAN)* is a networkof local area networks connected together. The connection might be a cable or a mixture of cable, fiber optic, and satellite connectivity.

*Modem* (abbreviation for modulate / demodulate) is a device that allows computers to communicate over ordinary phone lines. It converts digital computer data back and forth for use with analog phone line. There are two types of modems: internal and external. Internal means that modem goes inside your computer. External modem is outside your computer and must be plugged into it.

*A server* is a computer designed to provide various services for an entire network. It is typically either a workstation or a mainframe because it will usually be expected to handle far greater loads than ordinary desktop systems.

The roots of the Internet go to 1969, when the Defense Advances Research Projects arm of the Department of Defense created ARPANET for research in networking. The project title was “Resource Sharing Computer Networks”. The work centered around the problem in the Department of Defense – how to keep military sites in communication across the country in the event of a nuclear war.

In the beginning research was the main goal of the system. In 1994 an explosion of direct connections to the Internet occurs. Research is not any more the only purpose of Internet. The Internet experiences a steady growing process. Not only universities, research companies and other organizations became part of the Internet, but many of small businesses and home were connected.

The estimate for year 2000 was 40 million people connected to the Internet and the large majority were home connections in more than 50 countries.

The Internet provides many services. Among them:

* *E-mail*. You can send or receive electronic messages from anyone on the Internet. Anything that can be stored in text file can be mailed.
* *File Transfer*. The File Transfer Protocol (FTP) provides for the copying of files from one computer to another.
* *Communication*. you can communicate with the help of the Internet with one person or a group of persons simultaneously.
* *Information*. On the Internet all addresses / domain names refer to “electronic addresses”, e.g.:

person-id@computer name.domain name

There is never blank space between the components of the Internet address. User ids need not be unique (id – identification), e.g. two people with the same name can have it as login name as long as they operate on separate domains. But the domain name must be unique, however:

[Austin@galaxi.isr.umd.edu](mailto:Austin@galaxi.isr.umd.edu), [Austin@euler.berkley.edu](mailto:Austin@euler.berkley.edu)

Austin is the person-id, “galaxy” and “euler” are computer names, “isr.umd.edu” and “berkeley” are domain names. Domain names are composed of sub-domain names: esr, umd, edu. In the computer address *isr.umd.edu* the sub-domain “edu” tells that the computer is located at an educational institution. The sub-domain name “umd” stands for University of Maryland, and “isr” means the collection of computers at the Institute for System Research, at the University of Maryland.

If you want to send a message put down the word “mail” before the address.

Today computers are seen as indispensable tools not only for computation and typing but for communications. The merging of computation and communications is making essential changes to day-to-day business activities of engineers. Suppose an engineer belongs to a geographically dispersed team. He can:

* Use the Internet ? E-mail for day-to-day communications.
* Conduct engineering analyses at remote sites.
* Share results among the team members.
* Participate joint ventures assembled over a network, and online bidding of projects etc.

**III. Match the words in the left-hand column with their equivalents in the right-**

**hand column:**

|  |  |
| --- | --- |
| 1. access | 1. the act of receiving |
| 2. communicate | 2. far away in time or space |
| 3. convert | 3. give; translate; perform |
| 4. estimate | 4. ask |
| 5. goal | 5. close and careful scientific study |
| 6. handle | 6. the base of anything; a source; the underground part of a tree |
| 7. indispensable | **7**. a man-made object fired into space to orbit a planet |
| 8. local | 8. look over in order to find smth |
| 9. majority | 9. divide out among a number of people |
| 10. mixture | 10. happening or done at the same time |
| 11. outline | 11. constant |
| 12. own | 12. combine or join together |
| 13. receipt | 13. right or means of entry |
| 14. remote | 14. tell, make down |
| 15. render | 15. change (from one thing into another) |
| 16. request | 16. judge roughly the size, value etc of smth |
| 17. research | 17. anything aimed at |
| 18. root | 18. manage, cope with of a plant |
| 19. satellite | 19. necessary |
| 20. search | 20. of or confined to a certain place |
| 21. share | 21. the greater number or quality |
| 22. simultaneous | 22. smth made by combining different things |
| 23. steady | 23. line(s) showing a thing’s shape |
| 24. merge | 24. have a possession |

**IV. Answer the following questions:**

1. What is the Internet?
2. What does it mean ‘computer network’?
3. Which types of networks do you know?
4. What do we need modem for?
5. What are the ‘duties’ of server?
6. What types of computers are used as servers?
7. What can you tell about the roots of the Internet?
8. Which services does the Internet provide?
9. Which of the Internet services do you prefer to use mostly?
10. Does The Internet help you in your study or work? How?

11.What does the FTP provide?

12. What does the domain name of the computer mean?

**V. Retell the text briefly using the following expressions:**

Computer network, LAN, WAN, modem, to covert digital data, server, the roots of the Internet, connections to the Internet, e-mail, file transfer, communication, information.

**VI. Fill in the gaps with the missing words from the text. Mind that in each item the first letter of the word is used:**

1. N… is a group of computers that can i… by means of a shared communication link.

2. M… converts digital data b… and f… to use with phone line.

3. In the b… research was the main g… of the network.

4. A server is either a w… or a m… because it will be expected to handle much more

loads than ordinary desktop system.

5. Many people connected to the Internet and the large m… were home

connections.

6. With the help of the Internet you can communicate with a group of persons

s… .

7. If you are going to send a message write down the word “m…” before the

address.

8. There is never b… space between the c… of the Internet address.

9. The m… of computation and communication is making e… changes to

day-to-day business activities.

10. Today computers are seen as i… tools not only for c… and typing but for c… .

**VII. Rearrange the words and get the right sentences.**

1. information **/** to communicate / and / share / want / people.

2. plugged / is / it / your / computer / must / modem / outside / and / be / external / into.

3. of / an / explosion / direct / to / the / later / Internet / occurs / connections.

4. businesses / and / small / homes / were / many / of / connected .

5. from / you / send / or / messages / can / anyone / on / the Internet / receive.

6. never / there / address / between / the / blank / components / is / of / the / space.

7. are / as / tools / seen / indispensable / computers / today.

8. people / are / information / the Internet / making / via / available.

9. information / helps / to find / necessary / browser.

10. ventures / a network / participate / over / joint / can / assembled / an / engineer.

**VIII**. **Supply the prepositions if necessary**.

1. A device that allows computers to communicate … ordinary phones lines is called

modem.

2. External modem must be plugged … a computer.

3. ARPANET was created … research … networking.

4. Their work was centered around the problem – how military sites … communication

… the country … the event of a nuclear war.

5. … the beginning research was their main goal.

6. The File Transfer Protocol provides … the copying of files .. one computer

… another.

7. Many of small businesses were connected … the Internet.

8. The sub-domain ‘edu’ tells that the computer is located … educational institution.

**IX. There are two words given in each item. You have to explain in what way they are similar and how they differ from each other.**

1. (a) LAN, (b) WAN

2. (a) internal modem, (b) external modem

3. (a) server, (b) desktop system

4. (a) computer name, (b) domain name

5. (a) domain name, (b) sub-domain

6. (a) address, (b) mail address

**X. Give the opposites of the following words:**

external; beginning; connection; available; indispensable; find; combine; send; leave; remote.

**XI. Give the synonyms of the following words:**

research; render; project; type; purpose;. inform; many; share; own; concentrate.

**XII. Translate into English:**

1. Сначала основной целью интернета являлись исследования.

2. Корни интернета уходят к 1969 г.

3. Модем является сокращением слов модулятор и демодулятор.

4. Через интернет можно получать или отправлять письма или просто общаться.

5. Интернет позволяет быстро находить любую интересующую вас информацию.

6. Несмотря на то, что на ранней стадии Web имел своей целью развитие науки и

образования, позже он приобрел существенное значение для бизнеса.

7. Для нахождения необходимой информации в интернете следует пользоваться

специальной программой, которая называется «браузер».

8. Сервером называется компьютер, обслуживающий всю сеть.

9. Web-сервером называется программа, которая при получении запроса отсылает

клиенту затребованный документ.

10. Для соединения с клиентом необходимо знание его адреса.

**XIII. Read the text, try to understand the topic and put the items in the right**

**order. The first item is in the right position.**

1. Search engines as Altavista and Hotbot claim that they have indexed the contents

of tens of millions of web pages. How can they do this?

2. Resource discovery is perhaps the most exciting application of web robots. It means

that rather than relying solely on browsing, a Web user can combine browsing and

searching to locate information.

3. A Web robot is a program that traverses the Web’s hypertext structure

by retrieving a document, and recursively retrieving all documents that are

referenced. Such programs are sometimes called “spiders’, “web anderers”,

or “web worms”.

4. Even if the database doesn’t contain the exact item you want to retrieve, it is

likely to contain references to related pages, which in turn may reference the

target item.

5. Web robots can be used for statistical analysis (e.g., to count the number of Web servers), for maintenance (e.g., summarize large segments of the web).

**XIV**. **Look through the text. Make a short summary of it.**

**The World Wide Web**

The World Wide Web is a system of Internet servers that supports hypertext to access several Internet protocols on a single interface.

Almost every protocol type available on the Internet is accessible on the Web. Internet protocol are sets of rules that allow for intermachine communication on the Internet. The following major protocols are accessible on the Web:

E-mail (Simple Mail Transport Protocol or SMTP) distributes electronic messages and files to one or more electronic mailboxes.

Telnet (Telnet Protocol) facilitates login to a computer host to execute commands.

FTP (File Transfer Protocol) transfers text or binary files between an FTP server and client.

Usenet (Network News Transfer Protocol or NNTP) distributes Usenet news articles derived from topical discussions on newsgroups.

HTTP (HyperText Transfer Protocol) transmits hypertext over networks.

Other protocols are also available on the Web e.g., the Voice over Internet Protocol (VoIP) allows users to place a telephone call over the Web. The World Wide Web provides a single interface for accessing all these protocols.

This creates a convenient and user-friendly environment. It is not necessary to be conversant in these protocols within separate, command-level environments. The Web gathers these protocols into a system and is the fastest-growing component of the Internet (taking into account its ability to work with multimedia and advanced programming languages).

HyperText. The operation of the Web relies primarily on hypertext as its means of information retrieval. HyperText is a document containing words that connect to other documents. These words are called links and are selectable by the user. A single hypertext document can contain links to many documents. In the context of the Web, words or graphics may serve as links to other documents, images, video and sound. Hence, the WWW contains a complex virtual web of connections among a huge amount of documents, graphics, videos and sounds.

Producing hypertext for the Web is accomplished by creating documents with a language called HyperText Markup Language or HTML. With HTML, tags are placed within the text to accomplish document formatting, visual features such as font size, italics and bold, and creation of hypertext links. Graphics may also be incorporated into an HTML document. HTML is an evolving language, with new tags being added as each upgrade of the language is developed and released.

Pages on the Web. The World Wide Web consists of files, called pages and Web pages, containing information and links to resources throughout the Internet.

Web pages can be created by user activity. For example, if you visit a Web search engine and enter keywords on the topic of your choice, a page will be created containing the results of your search.

**XV. Translate the text in written form.**

**Multimedia**

The Web has become a broadcast medium. It is possible to listen to audio and video over the Web, both pre-recorded and live. For example, you can visit the sites of various news organizations and view the same videos shown on the nightly television news. Several plug-ins are available for viewing these videos. For example, Apple’s Quick Time Player downloads files with the .mov extension and displays these as “movies” in a small window on your computer screen. Quick Time files can be quite large, and it may take patience to wait for the entire movie to download into your computer before you can view it.

The problem of slow download times has been answered by a revolutionary development in multimedia capability: streaming media. In this case, audio or video files are played as they are downloading or streaming into your computer. Only a small wait, called buffering, is necessary before the file begins to play. The RealPlayer plug-in plays streaming audio and video files. Extensive files such as interviews, speeches and hearings work very well with the RealPlayer. The RealPlayer is also ideal for the broadcast of real-time events. These may include press conferences, live radio and television broadcasts, concerts, etc. The Windows Media Player is another streaming media player.

Shockwave presents another multimedia experience. Shockwave allows for the creation and implementation of an entire multimedia display combining graphics, animation and sound.

Sound files, including music, may also be heard on the Web. It is not uncommon to visit a Web page and hear background music. Sound files are also available for downloading independent of Web page visits. Sound files of many types are supported by the Web with the appropriate plug-ins. The MP3 file format, and the choice of supporting plug-ins, is the latest music trend to sweep the Web. The famous Napster site allows for the exchange of MP3 files.

Live cams are another aspect of the multimedia experience available on the Web. Live cams are video cameras that send their data in real time to a Web server. These cams may appear in all kinds of locations, both serious and whimsical: an office, on top of a building, a scenic locale, a special event, and so on.

**Appendix**

**Texts for written translation**

**Text 1**

**PROGRAMMING LANGUAGES AND FUNCTIONS**

The use of existing and new programming languages have extended the capabilities of the Web. What follows is a basic guide to a group of more common languages and functions in use on the Web today.

CGI, Active Server Pages: CGI (Common Gateway Interface) refers to a specification by which programs can communicate with a Web server. A CGI program, or script, is any program designed to accept and return data that conforms to the CGI specification. A common use for a CGI script is to process an interactive form on a Web page. For example, you might fill out a form ordering a book through Interlibrary Loan. The script processes your information and sends it to a designated e-mail address in the Interlibrary Loan department.

Another type of dynamically generated Web page is called Active Server Pages (ASP). Developed by Microsoft, ASPs are HTML pages that include scripting and creating interactive Web server applications. The scripts run on the server, rather than on the Web browser, to generate the HTML pages sent to browsers. Visual Basic and Jscript (a subset of JavaScript) are often used for the scripting. ASPs end in the file extension.asp.

Java / Java Applets: Java is probably the most famous of the programming languages of the Web. Java is not an object-oriented programming language similar to C++. Developed by Sun Microsystems, the aim of Java is to create programs that will be platform independent. The Java motto is “Write once, run anywhere”. A perfect Java program should work equally well on a PC, Macintosh, Unix, and so on, without any additional programming.

Web-based Java applications are usually in the form of Java applets. These are small Java programs called from an HTML page that can be downloaded from a Web server and run on a Java-compatible Web browser. A few examples include live newsfeeds, moving images with sound, calculators, charts and spreadsheets, and interactive visual displays.

JavaScript / Jscript: JavaScript is a programming language created by Netscape Communications. Small programs written in this language are embedded within an HTML page, or called externally from the page, to enhance the page’s functionality. Examples of JavaScript include moving tickers, drop-down menus, real-time calendars and clocks and mouse-over interactions. Jscript is a similar language developed by Microsoft and works with the company’s Internet Explorer browser.

**Text 2**

**DELPHI : ADVANTAGES**

Delphi is a [strongly typed](http://en.wikipedia.org/wiki/Strongly-typed_programming_language) [high-level programming language](http://en.wikipedia.org/wiki/High-level_programming_language), intended to be easy to use and originally based on the earlier Object Pascal language. Pascal was originally developed as a teaching language, without low-level programming facilities or access to hardware and with no emphasis on efficiency; Turbo Pascal and its descendants, including Delphi, are designed for efficiency and support access to hardware and low level programming, with the facility to incorporate code written in [assembly language](http://en.wikipedia.org/wiki/Assembly_language) and other languages. Delphi's [object orientation](http://en.wikipedia.org/wiki/Object-oriented_programming) features only class- and interface-based [polymorphism](http://en.wikipedia.org/wiki/Polymorphism_in_object-oriented_programming). Metaclasses are first class objects. Objects are actually references to the objects (as in [Java](http://en.wikipedia.org/wiki/Java_(programming_language))) which Delphi implicitly dereferences, so there is usually no need to manually allocate memory for pointers to objects or use similar techniques needed in some other languages. There are dedicated reference-counted string types and also null-terminated strings.

Strings can be concatenated by using the '+' operator, rather than using functions. For dedicated string types the programmer does not have to handle memory management as Delphi's memory manager handles this. The improved memory manager introduced with Borland Developer Studio 2006 provides functions to locate [memory leaks](http://en.wikipedia.org/wiki/Memory_leak).

The language is suitable for [Rapid Application Development](http://en.wikipedia.org/wiki/Rapid_Application_Development) (RAD) and Delphi includes an integrated IDE. The Delphi products all ship with a large framework called the [Visual Component Library](http://en.wikipedia.org/wiki/Visual_Component_Library), usually referred to by its initials VCL, including most of its source code. Third-party components (sometimes with full [source code](http://en.wikipedia.org/wiki/Source_code)) and tools to enhance the IDE or for other Delphi related development tasks are available free of charge or for purchase. The IDE includes a GUI for localization and translation of created programs which may be deployed to a translator at no additional cost; some developers prefer to use third-party products with more functionality for this purpose. The VCL framework maintains a high level of source compatibility between versions which simplifies adapting existing source code to a newer Delphi version. Third-party libraries may need updates from the vendor but, if source code is supplied, recompilation with the newer version may be sufficient. The VCL was an early adopter of [Dependency injection](http://en.wikipedia.org/wiki/Dependency_injection) or [Inversion of Control](http://en.wikipedia.org/wiki/Inversion_of_Control); it uses a sophisticated "re-usable" component model, extensible by the developer. With class helpers new functionality can be introduced to core RTL and VCL classes without changing the original source code of the RTL or VCL.

The quick optimizing single pass compiler can compile to a single [executable](http://en.wikipedia.org/wiki/Executable), simplifying distribution and eliminating [DLL](http://en.wikipedia.org/wiki/Dynamic-link_library) version issues. Delphi can also generate standard DLLs, [ActiveX](http://en.wikipedia.org/wiki/ActiveX) DLLs, [COM](http://en.wikipedia.org/wiki/Component_Object_Model) automation servers and Windows services.

The Delphi IDEs since Delphi 2005 increasingly support [refactoring](http://en.wikipedia.org/wiki/Refactoring) features such as method extraction[ and the possibility to create [UML](http://en.wikipedia.org/wiki/Unified_Modeling_Language) models from the source code or to modify the source through changes made in the model.

Each new release of Delphi attempts to be as compatible as possible with earlier versions, so that already-developed software and libraries can be retained. Incompatibility necessarily arises as new functionality is added, e.g., with support by Firemonkey of other platforms.

**Text 3**

**PERL**

Perl is a family of [high-level](http://en.wikipedia.org/wiki/High-level_programming_language), [general-purpose](http://en.wikipedia.org/wiki/General-purpose_programming_language), [interpreted](http://en.wikipedia.org/wiki/Interpreter_(computing)), [dynamic programming languages](http://en.wikipedia.org/wiki/Dynamic_programming_language). The languages in this family include Perl 5 and [Perl 6](http://en.wikipedia.org/wiki/Perl_6). Perl was originally developed by [Larry Wall](http://en.wikipedia.org/wiki/Larry_Wall) in 1987 as a general-purpose [Unix](http://en.wikipedia.org/wiki/Unix) scripting language to make report processing easier. Since then, it has undergone many changes and revisions. The latest major stable revision of Perl 5 is 5.20, released in May 2014. [Perl 6](http://en.wikipedia.org/wiki/Perl_6), which began as a redesign of Perl 5 in 2000, eventually evolved into a separate language. Both languages continue to be developed independently by different development teams and liberally borrow ideas from one another.

The Perl languages borrow features from other programming languages including [C](http://en.wikipedia.org/wiki/C_(programming_language)), [shell scripting](http://en.wikipedia.org/wiki/Shell_script) ([sh](http://en.wikipedia.org/wiki/Bourne_shell)), [AWK](http://en.wikipedia.org/wiki/AWK_(programming_language)), and [sed](http://en.wikipedia.org/wiki/Sed). They provide powerful text processing facilities without the arbitrary data-length limits of many contemporary [Unix commandline tools](http://en.wikipedia.org/wiki/Unix_commandline_tools), facilitating easy manipulation of [text files](http://en.wikipedia.org/wiki/Text_file). Perl 5 gained widespread popularity in the late 1990s as a [CGI scripting](http://en.wikipedia.org/wiki/Common_Gateway_Interface) language, in part due to its [parsing](http://en.wikipedia.org/wiki/Parsing) abilities.

In addition to CGI, Perl 5 is used for [graphics programming](http://en.wikipedia.org/wiki/Computer_graphics_(computer_science)), [system administration](http://en.wikipedia.org/wiki/System_administrator), [network programming](http://en.wikipedia.org/wiki/Computer_network_programming), finance, [bioinformatics](http://en.wikipedia.org/wiki/Bioinformatics), and other applications. It is nicknamed "the Swiss Army chainsaw of scripting languages" because of its flexibility and power, and possibly also because of its "ugliness". In 1998, it was also referred to as the "[duct tape](http://en.wikipedia.org/wiki/Duct_tape) that holds the Internet together", in reference to both its ubiquitous use as a [glue language](http://en.wikipedia.org/wiki/Glue_language) and its inelegance.

The overall structure of Perl derives broadly from C. Perl is [procedural](http://en.wikipedia.org/wiki/Procedural_programming) in nature, with [variables](http://en.wikipedia.org/wiki/Variable_(programming)), [expressions](http://en.wikipedia.org/wiki/Expression_(programming)), [assignment statements](http://en.wikipedia.org/wiki/Assignment_statement), [brace](http://en.wikipedia.org/wiki/Bracket)-delimited [blocks](http://en.wikipedia.org/wiki/Block_(programming)), [control structures](http://en.wikipedia.org/wiki/Control_structure), and [subroutines](http://en.wikipedia.org/wiki/Subroutine).

Perl also takes features from shell programming. All variables are marked with leading [sigils](http://en.wikipedia.org/wiki/Sigil_(computer_programming)), which unambiguously identify the [data type](http://en.wikipedia.org/wiki/Data_type) (for example, [scalar](http://en.wikipedia.org/wiki/Scalar_(computing)), [array](http://en.wikipedia.org/wiki/Array_data_type), [hash](http://en.wikipedia.org/wiki/Associative_array)) of the variable in context. Importantly, sigils allow variables to be [interpolated](http://en.wikipedia.org/wiki/Variable_interpolation) directly into [strings](http://en.wikipedia.org/wiki/String_(computer_science)). Perl has many built-in functions that provide tools often used in shell programming (although many of these tools are implemented by programs external to the shell) such as [sorting](http://en.wikipedia.org/wiki/Ascending_order), and calling on [operating system](http://en.wikipedia.org/wiki/Operating_system) facilities.

Perl 5 added features that support complex [data structures](http://en.wikipedia.org/wiki/Data_structure), [first-class functions](http://en.wikipedia.org/wiki/First-class_function) (that is, [closures](http://en.wikipedia.org/wiki/Closure_(computer_science)) as values), and an object-oriented programming model. These include [references](http://en.wikipedia.org/wiki/Reference_(computer_science)), packages, class-based [method dispatch](http://en.wikipedia.org/wiki/Dynamic_dispatch), and [lexically scoped variables](http://en.wikipedia.org/wiki/Scope_(programming)), along with [compiler directives](http://en.wikipedia.org/wiki/Compiler_directive) (for example, the strict pragma). A major additional feature introduced with Perl 5 was the ability to package code as reusable modules. Wall later stated that "The whole intent of Perl 5's module system was to encourage the growth of Perl culture rather than the Perl core."

|  |  |
| --- | --- |
|  |  |

**Text 4**

**OS X**

OS X, introduced as Mac OS X in 2001 and renamed OS X in 2012, is the latest version of Apple's operating system. Although it is officially designated as simply "version 10" of the Mac OS, it has a history largely independent of the earlier Mac OS releases.

The operating system is the successor to [Mac OS 9](http://en.wikipedia.org/wiki/Mac_OS_9) and the "classic" Mac OS. It is however a [Unix](http://en.wikipedia.org/wiki/Unix) operating system, based on the [NeXTSTEP](http://en.wikipedia.org/wiki/NeXTSTEP) operating system and the [XNU kernel](http://en.wikipedia.org/wiki/XNU) which Apple acquired after purchasing [NeXT Computer](http://en.wikipedia.org/wiki/NeXT_Computer)—with its CEO [Steve Jobs](http://en.wikipedia.org/wiki/Steve_Jobs) returning to Apple at that time. OS X also makes use of the [BSD](http://en.wikipedia.org/wiki/BSD) code. There have been ten significant releases of OS X, the most recent being OS X 10.9, referred to as [Mavericks](http://en.wikipedia.org/wiki/OS_X_Mavericks). Prior to 10.9 came 10.8 ("Mountain Lion"), 10.7 ("Lion"), 10.6 ("Snow Leopard"), 10.5 ("Leopard"), 10.4 ("Tiger"), 10.3 ("Panther"), 10.2 ("Jaguar"), 10.1 ("Puma"), and 10.0 ("Cheetah").

OS X also had six significant releases as OS X Server. The first of these, [Mac OS X Server 1.0](http://en.wikipedia.org/wiki/OS_X_Server_1.0), was released in [beta](http://en.wikipedia.org/wiki/Beta_(software)) before the client version in 1999. The server versions are architecturally identical to the client versions, with the differentiation found in their inclusion of tools for server management, including tools for managing OS X-based [workgroups](http://en.wikipedia.org/wiki/Workgroup_(computer_networking)), mail servers, and web servers, amongst other tools. As of the name change to OS X, OS X Server is no longer sold as a separate operating system product. The server tools could then be added to the singular OS X product, giving the same functionality.

OS X Server is available as an operating system to-order on [Mac Mini](http://en.wikipedia.org/wiki/Mac_Mini) and [Mac Pro](http://en.wikipedia.org/wiki/Mac_Pro) computers as a part of a server package. Unlike the client version, OS X Server can be run in a [virtual machine](http://en.wikipedia.org/wiki/Virtual_machine) using emulation software such as [Parallels Desktop](http://en.wikipedia.org/wiki/Parallels_Desktop) and [VMware Fusion](http://en.wikipedia.org/wiki/VMware_Fusion).

OS X is also the basis for [iOS](http://en.wikipedia.org/wiki/IOS_(Apple)), (previously iPhone OS) used on Apple's [iPhone](http://en.wikipedia.org/wiki/IPhone), [iPod Touch](http://en.wikipedia.org/wiki/IPod_Touch), [iPad](http://en.wikipedia.org/wiki/IPad), and [Apple TV](http://en.wikipedia.org/wiki/Apple_TV).

Installation of Mac OS X requires a Mac OS X *Installer emulator*, the most straightforward of which is a USB flash drive-type Installer emulator. Once the installation has been successfully completed to the hard drive, the hard drive may be booted using the *emulator* portion of the USB flash drive as a "helper" and a *boot loader Installer* may be downloaded and used to place the boot loader on the hard drive's boot blocks. Thereafter, Mac OS X may be booted from the hard drive alone; the installed boot loader takes care of any required device injection and/or kernel patching.

Mac OS X is generally compatible with any Intel desktop-based system or Intel-based motherboard, ICH6 or later, however compatibility past Snow Leopard cannot be assured with ICH6. Compatibility with ICH7 and with Lion and 945 (G)MCH has already been demonstrated and proven. Compatibility with ICH7 or later and any associated MCH/(G)MCH is quite good, certainly including Lion, and possibly also including Mountain Lion.

Mac OS X compatibility with Intel laptop- or netbook-based systems is quite variable but has been successful on a few Intel Atom-based netbooks.

|  |  |
| --- | --- |
|  |  |

**Text 5**

**WORLD WIDE WEB FUNCTION**

The terms Internet and World Wide Web are often used in everyday speech without much distinction. However, the Internet and the World Wide Web are not the same. The Internet is a global system of interconnected [computer networks](http://en.wikipedia.org/wiki/Computer_networks). In contrast, the web is one of the services that runs on the Internet. It is a collection of text documents and other resources, linked by hyperlinks and URLs, usually accessed by [web browsers](http://en.wikipedia.org/wiki/Web_browsers) from [web servers](http://en.wikipedia.org/wiki/Web_servers).

Viewing a [web page](http://en.wikipedia.org/wiki/Web_page) on the World Wide Web normally begins either by typing the [URL](http://en.wikipedia.org/wiki/Uniform_resource_locator) of the page into a [web browser](http://en.wikipedia.org/wiki/Web_browser) or by following a [hyperlink](http://en.wikipedia.org/wiki/Hyperlink) to that page or resource. The web browser then initiates a series of communication messages, behind the scenes, in order to fetch and display it. In the 1990s, using a browser to view web pages—and to move from one web page to another through hyperlinks—came to be known as 'browsing,' 'web surfing,' (after [channel surfing](http://en.wikipedia.org/wiki/Channel_surfing)) or 'navigating the web'. Early studies of this new behavior investigated user patterns in using web browsers. One study, for example, found five user patterns: exploratory surfing, window surfing, evolved surfing, bounded navigation and targeted navigation.

The following example demonstrates the functioning of web browser when accessing a page at the URL http://example.org/wiki/World\_Wide\_Web. The browser resolves the server name of the URL (*example.org*) into an [Internet Protocol address](http://en.wikipedia.org/wiki/IP_address) using the globally distributed [Domain Name System](http://en.wikipedia.org/wiki/Domain_Name_System) (DNS). This lookup returns an IP address such as *208.80.152.2*. The browser then requests the resource by sending an [HTTP](http://en.wikipedia.org/wiki/Hypertext_Transfer_Protocol) request across the Internet to the computer at that address. It requests service from a specific TCP port number that is well known for the HTTP service, so that the receiving host can distinguish an HTTP request from other network protocols it may be servicing. The HTTP protocol normally uses [port number 80](http://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers).

The computer receiving the HTTP request delivers it to [web server](http://en.wikipedia.org/wiki/Web_server) software listening for requests on port 80. If the web server can fulfill the request it sends an HTTP response back to the browser indicating success.

The web browser [parses](http://en.wikipedia.org/wiki/Parsing) the HTML, interpreting the markup (<title>, <p> for paragraph, and such) that surrounds the words in order to draw the text on the screen.

Many web pages use HTML to reference the URLs of other resources such as images, other embedded media, [scripts](http://en.wikipedia.org/wiki/JavaScript) that affect page behavior, and [Cascading Style Sheets](http://en.wikipedia.org/wiki/Cascading_Style_Sheets) that affect page layout. The browser will make additional HTTP requests to the web server for these other [Internet media types](http://en.wikipedia.org/wiki/Internet_media_type). As it receives their content from the web server, the browser progressively [renders](http://en.wikipedia.org/wiki/Layout_engine) the page onto the screen as specified by its HTML and these additional resources.

**Text 6**

**The INTERNET**

The origins of the Internet date back to research commissioned by the [United States government](http://en.wikipedia.org/wiki/United_States_government) in the 1960s to build robust, fault-tolerant communication via computer networks. While this work, together with work in the United Kingdom and France, led to important precursor networks, they were not the Internet. There is no consensus on the exact date when the modern Internet came into being, but sometime in the early to mid-1980s is considered reasonable. From that point, the network experienced decades of sustained exponential growth as generations of institutional, [personal](http://en.wikipedia.org/wiki/Personal_computer), and [mobile](http://en.wikipedia.org/wiki/Mobile_device) computers were connected to it.

The funding of a new U.S. [backbone](http://en.wikipedia.org/wiki/National_Science_Foundation_Network) by the [National Science Foundation](http://en.wikipedia.org/wiki/National_Science_Foundation) in the 1980s, as well as private funding for other commercial backbones, led to worldwide participation in the development of new networking technologies, and the merger of many networks. Though the Internet has been widely used by [academia](http://en.wikipedia.org/wiki/Academia) since the [1980s](http://en.wikipedia.org/wiki/1980s), the [commercialization](http://en.wikipedia.org/wiki/Commercialization) of what was by the 1990s an international network resulted in its popularization and incorporation into virtually every aspect of modern human life. As of June 2012[, more than 2.4 billion people—over a third of the](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [world's human population](http://en.wikipedia.org/wiki/World_population)[—have used the services of the Internet; approximately 100 times more people than were using it in 1995. Internet use grew rapidly in the West from the mid-1990s to early 2000s and from the late 1990s to present in the](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [developing world](http://en.wikipedia.org/wiki/Developing_world)[. In 1994 only 3% of American classrooms had access to the Internet while by 2002 92% did.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[Most traditional communications media including telephone, music, film, and television are being reshaped or redefined by the Internet, giving birth to new services such as](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [voice over Internet Protocol](http://en.wikipedia.org/wiki/Voice_over_Internet_Protocol) [(VoIP) and](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Internet Protocol television](http://en.wikipedia.org/wiki/Internet_Protocol_television) [(IPTV). Newspaper, book, and other print publishing are adapting to](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [website](http://en.wikipedia.org/wiki/Web_site) [technology, or are reshaped into](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [blogging](http://en.wikipedia.org/wiki/Blogging) [and](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [web feeds](http://en.wikipedia.org/wiki/Web_feed)[. The Internet has enabled and accelerated new forms of human interactions through](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [instant messaging](http://en.wikipedia.org/wiki/Instant_messaging)[,](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Internet forums](http://en.wikipedia.org/wiki/Internet_forum)[, and](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [social networking](http://en.wikipedia.org/wiki/Social_network_service)[.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Online shopping](http://en.wikipedia.org/wiki/Online_shopping) [has boomed both for major retail outlets and small](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [artisans](http://en.wikipedia.org/wiki/Artisan) [and traders.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Business-to-business](http://en.wikipedia.org/wiki/Business-to-business) [and](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [financial services](http://en.wikipedia.org/wiki/Financial_services) [on the Internet affect](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [supply chains](http://en.wikipedia.org/wiki/Supply_chain) [across entire industries.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[The Internet has no centralized governance in either technological implementation or policies for access and usage; each constituent network sets its own policies. Only the overreaching definitions of the two principal](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [name spaces](http://en.wikipedia.org/wiki/Name_space) [in the Internet, the](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Internet Protocol address](http://en.wikipedia.org/wiki/IP_address) [space and the](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Domain Name System](http://en.wikipedia.org/wiki/Domain_Name_System)[, are directed by a maintainer organization, the](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Internet Corporation for Assigned Names and Numbers](http://en.wikipedia.org/wiki/Internet_Corporation_for_Assigned_Names_and_Numbers) [(ICANN). The technical underpinning and standardization of the core protocols (](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)[IPv4](http://en.wikipedia.org/wiki/IPv4) [and](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [IPv6](http://en.wikipedia.org/wiki/IPv6)[) is an activity of the](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Internet Engineering Task Force](http://en.wikipedia.org/wiki/Internet_Engineering_Task_Force) [(IETF), a non-profit organization of loosely affiliated international participants that anyone may associate with by contributing technical expertise.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[**СПИСОК ЛИТЕРАТУРЫ**](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[1. Ray Girvan, “The revealed grace of the mechanism: computing after Babbage”// Scientific Computing World, May/June 2009, pp.14-19.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[2. “](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)[Let's build Babbage's ultimate mechanical computer”](http://www.newscientist.com/article/mg20827915.500-lets-build-babbages-ultimate-mechanical-computer.html)[. opinion. New Scientist, Oct.2010, pp.74-76.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[3.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [“A Computer Pioneer Rediscovered, 50 Years On](http://www.nytimes.com/1994/04/20/news/20iht-zuse.html)[”. The New York Times. April, 2004, p.4.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[4. Copeland, Jack, Colossus “The Secrets of Bletchley Park's Codebreaking Computers” //](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Oxford University Press](http://en.wikipedia.org/wiki/Oxford_University_Press)[, 2006, pp. 101–115](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[5. Lavington, Simon, “A History of Manchester Computers (2 ed.)”, Swindon // The British Computer Society, 2003, pp.34-35](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[6. Cooke-Yarborough, E. H. “Some early transistor applications in the UK” // Engineering and Science Education Journal (IEE), 2008 , № 7, pp. 100–106](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[7. David J. Eck. “The Most Complex Machine: A Survey of Computers and Computing*”//* A K Peters, Ltd., 2000, p. 54](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[8 .Erricos John Kontoghiorghes. “Handbook of Parallel Computing and Statistics*” //* CRC Press, 2006. p. 45.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[9. Jerry Peek; Grace Todino; John Strang “ Learning the UNIX Operating System*” //* A Concise Guide for the NewUser. O'Reilly, 2010, p. 130.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[10. Agatha C. Hughes “ Systems, Experts, and Computers “ //](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [MIT Press](http://en.wikipedia.org/wiki/MIT_Press)[, 2007, p. 161.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[11. Joseph D. Dumas](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [“Computer architecture: fundamentals and principles of computer design”](http://books.google.com/books?id=ZWaUurOwMPQC&q=quantum+computers&dq=insufficient+address+computer+architecture&source=gbs_word_cloud_r&cad=3#v=snippet&q=quantum%20computers&f=false)[, 2006, p.340.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[12. Ifrah, Georges ” The Universal History of Computing: From the Abacus to the Quantum Computer”// New York: John Wiley & Sons, 2006.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[13. Lapworth, Leo.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) ["General Questions About Perl"](http://learn.perl.org/faq/perlfaq1.html#Whats-the-difference-between-perl-and-Perl-) [//*Perl FAQ*. Perl.org., 2012.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[14.”](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)[A Brief History of the Internet”](http://www.isoc.org/internet/history/brief.shtml) [//](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Internet Society](http://en.wikipedia.org/wiki/Internet_Society)[, 2008.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[15.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) ["The Modern History of Computing"](http://plato.stanford.edu/entries/computing-history/) [// Stanford Encyclopedia of Philosophy, 2010](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[16.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) [Computer](http://dictionary.oed.com/)[, Oxford English Dictionary (2 ed.) // Oxford University Press, 2009.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)

[17.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit) ["The Open Brand – Register of Certified Products – OS X 10.5 on Intel-based Macintosh computers"](http://www.opengroup.org/openbrand/register/brand3555.htm) [// The Open Group, 2009.](http://en.wikipedia.org/w/index.php?title=Internet&action=edit)