Unit 1 Introduction of Computers

1.1 Text

音频

A computer is a digital electronic data processing system. It is now an acknowledged definition. The digital computer is a digital system performs various computation tasks. The word digital implies that the information in the computer is represented by variables that take a limited number of discrete values. These values are processed internally by components that can maintain a limited number of states. Digital computer uses the binary number system, which has two digits: 0 and 1. A binary is called a bit. Information represented in digital computers is in groups of bits. By using various coding techniques, group of bits can be made to represent not only binary number but also other discrete symbols, such as decimal digits or letter of alphabet.[1] By judicious use of binary arrangements and by using various coding techniques, the groups of bits are used to develop complete set of instructions for performing various types of computation.

Computer Development

♦ The First Generation of Computers (1946 through 1959)

The first generation of computers was characterized by the most prominent feature of the ENIAC-vacuum tubes. Through 1950, several other notable computers were built, each contributing significant advancements, such as binary arithmetic, random access, and the concept of stored programs. These computer concepts are common in today's computers.

♦ The Second Generation of Computers (1959 through 1964)

To most people, the invention of the transistor meant small portable radios. To those in the data processing business, it signaled the start of the second generation of computers. The transistor meant more powerful, more reliable, and less expensive computers that would occupy less space and give off less heat than did vacuum-tube-powered computers.[2]

♦ The Third Generation of Computers (1964 through 1971)

Integrated circuits did for the third-generation what transistors did for the second generation. The compatibility problems of second-generation computers were almost eliminated in third-generation computers. However, third-generation computers differed radically from second-generation computers. The change was revolutionary, not evolutionary, and caused conversion nightmares for thousands of computer users. In time, the conversion of information systems from second-generation to third-generation hardware

was written off as the price of progress.

♦ The Fourth Generation of Computers (1971 through now)

The fourth generation of computers is more difficult to define than the other three generations. This generation is characterized by more and more transistors being contained on a silicon chip. First there was large scale integration (LSI), with hundreds and thousands of transistors per chip, then came very large scale integration (VLSI), with tens of thousands and hundreds of thousands of transistors. The trend continues today. One of the most significant contributions to the emergence of the fourth generation of computers is the microprocessor.

Most computer vendors classify their computers as being in the fourth generation of computers, and a few call theirs "the fifth generation". The first three generations were characterized by significant technological breakthroughs in electronics — the use of vacuum tubes, then transistors, and then integrated circuits. Some people prefer to pinpoint the start of the fourth generation as 1971, with introduction of large-scale integration (more circuits per unit space) of electronic circuitry. However, other computer designers argue that if we accept this premise, then there would probably have been a fifth, a sixth, and maybe a seventh generation since 1971.

Computer Types

Computers can be general classified by size and power as follows:

Microcomputer: Microcomputer is generally a synonym for the more common term, personal computer, or PC, which is a small single-user computer based on a microcomputer. In addition to the microprocessor, a personal computer has a keyboard for entering data, a monitor for displaying information, and a storage device for saving data.[3]

Workstation: Workstation is a powerful single-user computer. It is like a personal computer, but it has a more powerful microprocessor and a higher-quality monitor.

Mainframe: Mainframe or mainframe computer is a powerful multi-user computer. It is capable of supporting many hundreds or thousands of users at the same time. It is now usually referred to a "large server".

Minicomputer: Minicomputer (a term no longer much used) is a multi-user computer of a size between a microcomputer and a mainframe.

Supercomputer: Supercomputer is an extremely fast computer that can perform hundreds of millions of instructions per second, but now it refers to a "very large server" and sometimes includes a system of computers using parallel processing.

Desktop Computers

Desktop computers are the natural choice when a computer remains in the same place for all of its working life.[4] The modular design of a desktop system makes it relatively easy to configure it with exactly the right set of features and functions and for your specific needs.

The parts inside a desktop computer usually follow one or more design standards, so it is often possible to replace a component that fails with a new one from a different manufacturer. And when you want to add more memory, a large hard drive or monitor to your system, you can be confident that you won't have to limit yourself to products from a single manufacturer. Just because the label on the case says Compaq or Gateway, you can still go to a big box-retailer and choose from among many different brands.

This combination of modular design and competition is one reason that the prices of most desktop computer components are lower than the comparable, non-standard parts in a laptop. In addition, the common parts specifications allow a repair shop to maintain a smaller inventory because they can use the same parts in many different desktop computer makes and models.[5]

Desktop computers are modular systems that make it easy to add or replace individual parts to meet each user's particular requirements. A computer intended for an illustrator or a computer-aided designer might have a higher-quality graphics controller and video display, where a purchasing agent may not use anything more demanding than a word processor and a spreadsheet. Most computer manufacturers let you order exactly the set of features and specifications that you want.

When you need change, it is usually easy to open up a desktop case and reconfigure the system, unless your computer uses proprietary parts. You can be confident that the sockets on the motherboard and the mounting holes in the drive bays fit the new expansion card or disk drive, and the main printed circuit board that controls the rest of the system works with the new parts.

Modular design also means that you can transfer some old parts to your new computer when your old faithful machine that has finally become obsolescent. Of course, there are some limits to this flexible design. You can not use a brand-new memory module or the latest disk drives with a 10-year-old motherboard because the designs have changed to accommodate newer and better processors and other devices.

You can improve the computer's performance by adding new components and replacing existing parts with new ones that have faster speed, greater capacity, or more features. Once again, the desktop computer's modular design makes it easy to work inside the case. Of course, there is a point of diminishing returns where it is better and less costly to buy a new system, but just about every desktop computer has room for economical improvement. The most common and effective motherboard has one or more sockets for memory modules, so you can increase the total amount of memory by adding one or more new modules to the memory that is already in place. You can also remove the existing memory and replace it with the same number of modules with more memory on each module. Adding memory is easier in a desktop system because there is plenty of space inside the case.

The CPU chip in a desktop system—the central processing unit that controls everything else—is also relatively easy to remove and replace with a faster CPU with similar architecture, and that fits in the same socket. A new CPU can offer faster processing and better performance than the one that was originally supplied with the computer. Unlike most of the other integrated circuits on the motherboard, the CPU mounts in a special socket that uses a latching mechanism to hole it in place.

Keywords

accommodate	*v.*	供应，适应，调节	discrete	*adj.*	离散的，分立的
alphabet	*n.*	字母表	eliminate	*v.*	消去，淘汰
arrangement	*n.*	安排，整理，约定	emergence	*n.*	出现，发生
compatibility	*n.*	兼容性，一致性	expansion	*n.*	扩展，扩大
configure	*v.*	配置	evolutionary	*adj.*	发展的，进化的
conversion	*n.*	变化，转换	illustrator	*n.*	说明者

instruction	*n*.	指令	proprietary	*adj*.	专有的，独占的
latch	*v*.	获得，抓住	reliable	*adj*.	可靠的，确实的
mainframe	*n*.	大型机	represent	*v*.	描述，表示
manufacturer	*n*.	制造商	revolutionary	*adj*.	革命性的
notable	*adj*.	显著的，著名的	silicon	*n*.	硅
obsolescent	*adj*.	废弃的，淘汰的	socket	*n*.	插座，插槽
occupy	*v*.	占据，占用	transistor	*n*.	三极管
portable	*adj*.	便携式的	vacuum	*n*.	真空
prominent	*adj*.	突出的，重要的			

Notes

[1] By using various coding techniques, group of bits can be made to represent not only binary number but also other discrete symbols, such as decimal digits or letter of alphabet.

译文：通过应用各种编码技术，字位的组合不但可以用来表示二进制数，还可以表示其他离散符号，如十进制数字和字母表上的字母等。

说明：本句的 By using various coding techniques 作状语，主句采用被动语态。

[2] The transistor meant more powerful, more reliable, and less expensive computers that would occupy less space and give off less heat than did vacuum-tube-powered computers.

译文：晶体管计算机意味着功能更强、更可靠、更价廉，它与真空管计算机相比占地面积小，功耗小。

说明：本句的 that 引导定语从句，修饰宾语 computers。

[3] In addition to the microprocessor, a personal computer has a keyboard for entering data, a monitor for displaying information, and a storage device for saving data.

译文：除了微型处理器外，个人计算机还有输入数据的键盘、显示信息的显示器和存储数据的存储装置。

说明：本句中的 In addition to the microprocessor 是状语，宾语是 keyboard、monitor 和 storage device，宾语后的 for 结构是宾语补足语。

[4] Desktop computers are the natural choice when a computer remains in the same place for all of its working life.

译文：当一台计算机在它整个工作期间一直都被放在同一个地方时，台式计算机是一个理所当然的选择。

说明：本句由 when 引导时间状语从句。

[5] In addition, the common parts specifications allow a repair shop to maintain a smaller inventory because they can use the same parts in many different desktop computer makes and models.

译文：此外，一般的配件说明书中都允许维修车间维持较少的库存量，这是因为在不同的品牌和模式的台式计算机上可以使用相同的配件。

说明：本句由 because 引导原因状语从句，to maintain a smaller inventory 作宾语补足语。

1.2 Reading Material 1：Motherboard

Motherboard is also known as main board or system board. It is installed in the chassis. It is also one of the most important components of a computer. Motherboard is generally rectangular circuit board. If the

CPU is considered as the brain of a computer, then the motherboard is the body of a computer. When the computer has a high performance brain (CPU), it also needs a healthy strong body (motherboard) to operate. Motherboard affects the performance of the entire computer system.

Motherboard Structure

Motherboard is usually composed of a CPU slot, an AGP slot, a CNR slot, five PCI slots, three DIMM slots, two IDE interfaces, a floppy drive interface, two serial ports, one parallel port, a PS/2 keyboard interface, a PS/2 mouse interface, two USB interfaces, erasable BIOS, control chip sets and other components.

CPU slot consists of Socket series and Slot series. Socket series CPU slot uses ZIF (zero insert force) standards. Socket is next to a lever. Pull the lever, each stitch of CPU can be easily inserted into each orifice of the socket, then press lever to its original position, CPU can be fixed. Slot series adopt the form of slot, looking like a common expansion slot on the motherboard. Any external interface card, such as graphics, sound card, NIC, etc., would have to be planted on the expansion slot on the motherboard so that it can communicate with the motherboard and export images and sound.

AGP slot is devoted to the high-speed image processing. AGP slot is similar to PCI expansion slot on shape, and the color is brown. AGP can only be inserted graphics into, therefore on the motherboard there is only an AGP interface. Now most of the motherboards adopt AGP 8×interfaces with AGP 8×display cards, which greatly enhances the computer's ability to handle 3D.

The role of memory lots is to install memory. Memory slots have 30 lines, 72 lines, 168 lines and 184 lines, now 168 lines.

BIOS (Basic Input/Output System) is a ROM chip installed on the motherboard, with the most important basic input/output procedures of a computer system, the setup about CMOS, the self-inspection procedures and so on.

Floppy drive interface is generally a socket with 34 double row needles, with the label of Floppy, FDC or FDD. IDE interface is a socket with 40 double row needles, which is used to connect to IDE hard drives or CD-ROM drives. Now in order to improve the reliability of data transmissions, the needles are up to 80.

The motherboard provides a standard AT keyboard DIN connector for attaching a keyboard. You can directly plug a keyboard cable to this connector.

The motherboard also provides a 5-pin connector for PS/2 mouse cable (optional). You can directly plug a PS/2 mouse cable to it.

Power socket has two specifications, AT and ATX. ATX is the power socket specification used widely now, with the use of ATX power supply. ATX power socket is a 20-double socket, with anti-inserted wrong structure, if the plug is in wrong way, it could not get on. Hence there is no need to worry about burning the motherboard.

Computer system is closely related to the clock, and when the computer is turned off, the battery provides the power needed by the system clock. The battery, usually a button battery, is inserted into the battery slot of the motherboard.

Sound Card and Graphics

Sound card is audio sound card. Its basic function is to produce and handle voice signals, and then

transfer the signals to the speakers. These signals exist in the computer in the form of digit. The digital signals will be processed by sound card chip, and then can be converted into analog signals which can be identified by people's ears by using the digital-to-analog (D/A) converter on the sound card. If it has to deal with external input sound signals, at the first step, sound card should convert these signals into the digital signal which can be recognized by the computer by using the analog-to-digital (A/D) converter, and then transfer the digitals to the sound card chip for processing.

Graphics is short for graphics display card. The early graphics was not took too much attention to, its role was merely to convert the data from the processor and then display them on the screen strictly. With the continuous increase of the graphics software, particularly the increasing popularity of the graphics system, just relying on the CPU to handle all the data would greatly affect the overall performance of the system, so graphics appeared.

Graphics works more as a coprocessor. It is right for accelerating graphics processing operation, and the CPU can handle other more important tasks. In fact, the graphics is already graphics accelerator card now, which can perform a number of graphic processing functions. The accelerator capability is to provide graphics function computing power by the chip set on the accelerator card, which is also known as accelerator or graphics processor. Generally speaking, there is a clock generator, VGA core and the hardware accelerator in the chip set.

Keywords

accelerate	*v*.	加速，促进	needle	*n*.	针，磁针
attention	*n*.	注意，留意	orifice	*n*.	口，孔
chassis	*n*.	机箱	popularity	*n*.	普及，流行
lever	*n*.	杠杆	rectangular	*adj*.	矩形的
merely	*adv*.	只，纯粹	strictly	*adv*.	精密地，严格地

1.3 Reading Material 2：Notebook Computer

Notebook computers are the further development of PCs. The primary innovation is to ensure the performance and speed of the new generation of notebook computers, so that users who are used to their powerful PCs on the desktops need not compromise on performance and speed when they switch to notebook computers while they are on the road, for example, traveling on duty, doing business outside office, interviewing guests or audience in public places, or even accessing to Internet anywhere they go. Today, notebook computers are no longer the "luxury toy" of executives as they are now more affordable than ever before.

Higher performance of CPUs, multimedia technology, as well as bigger memory and large-capacity silicon chips allow manufacturers to put in fancier things into notebook computers. For notebook computers to be part of the enterprise computing system, manufacturers are including built-in networking, modem and other forms of communications capabilities in notebook computers.

To make the Compaq notebook easy to use, the company preloads all models with the Tabwords, software for launching, organizing and accessing applications and documents. This graphical interface

looks like a notebook-diary to encourage intuitive working. Versions of the ThinkPad 750 series use both pen and keyboard input. Voice input will soon be available for basic commands on all its 750 series units. When configured with speech recognition software, IBM promises full dictation in near future.

In summary, the trend of notebook computers is as follows:

- Faster speed. Processors used are now usually fast CPUs.
- Large storage capacity.
- Multimedia capabilities. To support microphones, headphones, video-performance, and CD-ROM.
- Easier input methods. Pen, voice, and speech recognition in future.
- Built-in data communication support. Networking, built-in modern, even wireless support.

Although the battery life of notebook computers is longer than what it used to be, manufacturers continue to work to extend the battery life of notebook computers.

Weight is an important consideration and notebook computers are getting lighter although more features have been packed into the system.

Keywords

affordable	*adj.*	负担得起的	innovation	*n.*	创新，革新
compromise	*n.*	折中方案，调和	interview	*v.*	协商，会谈
fancier	*n.*	行家，空想家	intuitive	*adj.*	直觉的，直观的
headphone	*n.*	头戴受话器，耳机			

1.4 专业英语基础知识

计算机专业是融科学性与技术性于一体的学科，在专业文献的表达中应当遵循科技文体的规范。科学著作、学术论文、实验报告、设计报告、科技产品说明书、科技产品操作指导等都属于科技文体。科技文体讲究逻辑的条理清楚和叙述的准确、严密。计算机专业英语以表达计算机专业知识和技术的概念、理论和事实为主要目的，专业英语的主要特点是具有很强的专业性。因此，在表达中要注重客观事实和真相，要求逻辑性强、条理规范、精练及正式。

因为专业科技文献所涉及的内容（如科学定义、定理、方程式或公式、图表等）一般没有特定的时间关系，所以在专业文献中大部分都使用一般现在时。至于一般过去时、一般完成时也在专业英语中经常出现，如科技报告、科技新闻、科技史料等。用尽可能少的单词来清晰地表达原意，这就导致了非限定动词、名词化单词或词组及其他简化形式的广泛使用。

为了准确精细地描述事物过程，有时句子很长，会出现一段就是一个句子的情况。长句反映了客观事物中复杂的关系，它与前述精练的要求并不矛盾，句子虽长，但结构仍是精练的，只是包含的信息量大，准确性较高。

计算机专业文章一般重在客观地叙述事实，力求严谨和清楚，避免主观成分和感情色彩，这就决定了专业文体具有以下语法特点。

（1）叙述方式常避免用第一人称单数，而用第一人称复数 we，或者用 the author 等第三人称形式。

（2）被动语态使用频繁，而且多为没有行为的被动语态。

（3）时态形式使用比较单一，最常用的有五种时态，即一般现在时、现在进行时、一般过去时、一般将来时和现在完成时。

（4）谓语经常使用静态结构，用来表示状态或情况。

（5）定语经常使用名词作定语，以取得简洁的效果。

（6）经常使用动词非限定形式来扩展句子，如动词不定式短语、动名词短语、分词短语及独立分词结构。

（7）名词性词组多，即以名词为中心词构成短语以取代句子。

（8）多重复合句较多，句子中又嵌入句子。

（9）在说明书、手册中广泛使用祈使句。

（10）逻辑词语使用很频繁，明确表示出内容的内在联系，有助于清楚地叙述、归纳、推理、论证和概括，如 as a result、consequently、on the contrary、as mentioned above 等。

（11）插图、插画、表格、公式、数字所占比例大。

以下句子能充分体现计算机专业英语的语法特点。

（1）The procedure by which a computer is told how to work is called programming.

句子的主要结构为 The procedure is called programming。用一般现在时和被动语态。by which 为“介词+关系代词”引导定语从句，从句的谓语也为被动语态，which 指代 procedure。

译文：告诉计算机如何工作的过程称为程序设计。

（2）Written language uses a small number of symbols which are easily encoded in digital form and can be combined in innumerable ways to convey meaning.

句中 are encoded 和 can be combined 是并列谓语，用被动语态，in digital form 和 in innumerable ways 中的介词 in 表示以什么形式、用什么方式。

译文：书面语言只使用少数符号，它们很容易用数字形式编码，并且可以用数不清的方法进行组合以便表达意义。

（3）Having developed the capacity to store vast quantities of data, and compress it into a small space, and now having the capability to accurately and quickly retrieve information via adaptive pattern recognition make up the core which is taking multimedia solutions from a fringe technology to something which is at the beginning of pervading every aspect of our lives, and finally, living up to the promises that the hype has generated during the last five years.

这是长句，翻译时要注意准确和精练。本句中的主语是动名词短语 Having developed the capacity to store vast quantities of data, and compress it into a small space, and now having the capability to accurately and quickly retrieve information via adaptive pattern recognition，谓语是 make up，宾语是 the core，which is at the beginning of pervading every aspect of our lives, and finally, living up to the promises 是定语从句，修饰 something。that the hype has generated during the last five years 也是定语从句，修饰 promises。

译文：已经能够存储大量数据并把它压缩到一个小的空间，能够迅速而准确地通过自适应模式识别来恢复信息，这些构成了这个核心。该核心正在使多媒体从一项边缘技术变成一项渗透我们生活的每一方面，并且最后将实现广告在近五年里所做出许诺的技术。

（4）Technology for development will allow construction of larger projects, artificial intelligence (intelligent agents, knowledge based systems, data mining and intelligent filtering, and so on) will be increasingly feasible as costs decrease, performance improves and widespread networking are available.

这也是一个长句。本句的主语是 Technology for development，谓语是 will allow，其后是一宾语从句，作 allow 的宾语。在该宾语从句中，construction of larger projects, artificial intelligence (intelligent

agents, knowledge based systems, data mining and intelligent filtering, and so on)作主语，will be increasingly feasible 是系表结构作谓语，as 引导的原因状语从句作状语，修饰谓语。

译文：技术发展带来的成本的降低、性能的提高，以及网络的广泛应用使得建造更大的工程、人工智能（智能代理、知识库系统、数据挖掘及智能过滤等）将更加可行。

计算机专业术语多，而且派生和新出现的专业用语还在不断地增加。这些术语的出现是和计算机技术的高速发展分不开的。在词汇方面，体现为专业术语多、缩略词多、半技术词汇多、合成新词多、希腊词根和拉丁词根的词多等特点。例如，Internet、Intranet、Extranet 等都是随着网络技术的发展而出现的。CPU(central processing unit)、WPS(word processing system)、NT(network technology)、IT(information technology)等都是典型的缩略语。这些词汇的掌握首先要有一定的英语词汇量，还要有对新技术的了解。

科学技术本身的性质要求专业英语与专业内容相互配合，相互一致，这就决定了专业英语与普通英语有很大的差异。

1.5 Exercises

1. Translate the following phrases.

data processing system
digital computer
integrated circuit
very large scale integration
single-user computer
video display
desktop computers
printed circuit board
central processing unit
decimal digit
sound card
notebook computer

2. Fill in the blanks with appropriate words or phrases.

a. second　　b. microprocessor　　c. multi-user　　d. desktop computers
e. in place　　f. change　　g. computation　　h. instructions

(1) The digital computer is a digital system performs various_____tasks.
(2) Integrated circuits did for the third-generation what transistors did for the _____ generation.
(3) One of the most significant contributions to the emergence of the fourth generation of computers is the_____.
(4) Mainframe computer is a powerful_____computer.
(5) Supercomputer is an extremely fast computer that can perform hundreds of millions of _____per second.

(6) _____are modular systems that make it easy to add or replace individual parts to meet each user's particular requirements.

(7) When you need _____, it is usually easy to open up a desktop case and reconfigure the system.

(8) The CPU mounts in a special socket that uses a latching mechanism to hole it _____.

3．Match the following terms to the appropriate definition.

a. agent　　b. applet　　c. analog-to-digital

d. authentication　　e. application　　f. broadcasting

(1) The process of identifying an individual, usually based on a username and password.

(2) Client or robot programs, often able to act autonomously.

(3) A small Java program that can be embedded in an HTML page.

(4) The dissemination of any form of radio electric communications by means of Hertzian waves intended to be received by the public.

(5) A device that converts a signal whose input is information in the analog form and whose output is the same information in digital form.

(6) Also called end-user programs, includes database programs, word processors, and spreadsheets.