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计算机 英语



苏 雪 程新丽 主编

English for Computer Science

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计算机英语

English for Computer Science

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前 言

现代社会, 计算机技术日新月异, 大量的新思想、新概念、新知识和新技术通过互联网及各种渠道不断涌现。计算机专业英语课程对学习计算机新知识和新技术起着非常重要的作用。为了适应社会对计算机人才的要求, 同时为适应国家大力发展职业教育的要求, 我们组织编写了这本书。

本书是一本实用的计算机专业英语教材, 以计算机技术、通信技术、网络技术和多媒体技术等为背景, 首先考虑计算机基本体系及常用操作, 系统介绍了计算机及相关方面的内容, 基本涵盖了现代计算机技术的各个领域; 同时紧跟计算机技术日新月异的变化, 尽可能兼顾材料的实用性、广泛性和前瞻性。本书内容由浅入深, 注释详细, 较适合高职高专、中职学校计算机及相关专业学生, 以及二级学院本科学生学习。本书教学大约需要 80 至 120 学时, 每课可进行 2 至 4 学时, 教师可根据本校教学侧重点和学生特点选取部分内容作为主讲, 其余部分可供学生课后阅读和拓宽知识面使用。

全书分六个单元, 包括计算机简介、硬件知识、软件知识、计算机应用、网络和多媒体、计算机科学新技术。其中硬件部分包括 CPU、存储器、输入/输出。软件部分包括软件工程、数据结构、操作系统、程序和程序设计。计算机应用部分包括办公自动化、数据库、计算机图形学、电子商务。网络和多媒体部分包括计算机网络、互联网、多媒体、计算机安全。计算机科学新技术部分包括实时 Java 技术、人工智能与专家系统、虚拟现实。全书每一课都由课文、单词和词组、难句分析、练习等内容组成。为方便学习, 文后附录中包括计算机专业英语词汇表、单词表、模拟试题等。同时考虑到教学实际, 书中的大部分词汇给出了音标, 对一些合成词以及专业词汇等未给出音标, 特此说明。

本书由武汉铁路职业技术学院苏雪、程新丽主编, 罗君、肖凯任副主编; 郑毛祥主审; 赵亚军也参与了本书附录部分的编写工作。在本书的编写过程中, 湖北交通职业技术学院龙萍、曾怡, 武汉船舶职业技术学院周芸等老师提供了宝贵的经验和建议。此外, 华中科技大学出版社的刘平、杨玉斌编辑也给予了积极支持和帮助, 在此一并表示感谢。

本书旨在提高学生专业英语的能力, 了解计算机相关领域国内外的最新发展动态, 此教材既可作为高职高专院校的专业英语教材, 也可供计算机本科(含二级学院)及英语爱好者使用。

由于作者水平有限, 书中难免有不当之处, 敬请读者批评指正!

编 者
2013 年 1 月

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Unit One A Brief Introduction to Computers

(计算机简介)



Text 1

Foundation of Computers (计算机基础)

A computer is an electronic equipment which can make arithmetic and logical calculation, process information rapidly and automatically.^[1]

It was in 1946 that the first computer of the world was invented in America; it was named ENIAC. Though it was very huge and without high performance, it made basis for the development of computers.

Since the first computer was born, the development of computer science technique has been quite surprising. Take the speed of calculation for instance, ENIAC could only make calculations 5 000 times per second; but today, the fastest computer can do 100 000 000 000 times.^[2]

Computers can process various tasks in a variety of areas, such as industry, agriculture, finance, transportation, culture and education, national defense and family use. In summary, applications of computers may be classified as follows.

Science calculation

The purpose of inventing and developing computer is to make arithmetic calculation rapidly and accurately. Computers can be used for all kinds of science calculations, which have become one of the most important fields of computer application, for example, calculations in the process of launching satellites and missiles, etc.

Data processing

With the development of science and technology, more and more information including numerical data and non-numerical data comes out.^[3] At present, data processing is the widest field of computer application. Production management, data counting, office automation, traffic dispatching, information retrieval all belong to this field. Especially in recent years, with the development of the database and computer network technique, computer users in different districts and countries can share many

valuable information resources through the network.^[4]

Real-time control

Real-time control is the control of procedure in the process of practical productions where computers are applied.^[5] Real-time means that the time of computer's calculating and controlling may match the time of controlled object's practical running or working.

Adjuvant design

With its strong ability in calculating and mapping, we can use the computer to improve the quality and efficiency when doing engineering designs in the matter of architecture, machinery and electron. At present, as CAM, CAD and CAI being used very widely, complete automation from design to production has been achieved in many fields.^[6]

Artificial intelligence

Computers can simulate people's feelings and thoughts, replacing part labors of human being.^[7]

New Words and Expressions

electronic [i,lek'trɒnik] *adj.* 电子的, 电子学的

arithmetic [ə'riθmətik] *n.* 算术

automatically [ɔ:tə'mætikli] *adv.* 自动地

variety [və'raɪəti] *n.* 变化, 多样性, 种类

performance [pə'fɔ:məns] *n.* 性能; 执行; 表演

purpose ['pɜ:pəs] *n.* 目的, 用途

accurately ['ækjəreɪtli] *adv.* 精确地, 正确地

launch [lɔ:ntʃ] *v.* 发射 (导弹、火箭) *n.* 发射, (船)下水

missile ['misail] *n.* 导弹; 发射物

numerical [nju(:)'merikəl] *adj.* 数字的, 用数字表示的

dispatch [dis'pætʃ] *v.* 调度, 派遣

retrieval [ri'tri:vəl] *n.* (计算机系统的信息)检索

district ['distrikt] *n.* 地区; 行政区

real-time *adj.* (计算机)即时处理的, 实时的

adjuvant ['ædʒuvənt] *adj.* 辅助的

efficiency [i'fiʃənsi] *n.* 效率, 效能

architecture ['ɑ:kitektʃə] *n.* 建筑, 建筑学; (计算机的)体系机构

machinery [mə'ʃi:nəri] *n.* 机械, 机器

electron [i'lektrɒn] *n.* 电子

simulate ['simjuleit] *v.* 模拟, 模仿

office automation 办公自动化

artificial intelligence 人工智能

in the matter of 在……方面, 关于

CAM (computer aided manufacturing) 计算机辅助制造

CAD (computer aided design) 计算机辅助设计

CAI (computer aided instruction) 计算机辅助教育

Notes to the Text

1. A computer is an electronic equipment which can make arithmetic and logical calculation, process information rapidly and automatically.
句中 which 引导的定语从句 which can make arithmetic and logical calculation, process information rapidly and automatically 修饰先行词 equipment.
译文 计算机是一种能够高速、自动地进行算术和逻辑运算及信息处理的电子设备。
2. Take the speed of calculation for instance, ENIAC could only make calculations 5 000 times per second; but today, the fastest computer can do 100 000 000 000 times.
译文 就运算速度而言, ENIAC 每秒仅能完成 5 000 次运算; 而如今最快的计算机, 其速度可达每秒钟运算千亿次。
3. With the development of science and technology, more and more information including numerical data and non-numerical data comes out.
句中 “with+另一成分” 在句中作状语, 表示方式、条件或伴随情况。例如: Tom did his homework with the TV on. 汤姆开着电视做功课。
译文 随着科学技术的发展, 涌现的信息量与日俱增, 这些信息除了数值型数据外, 还有大量的非数值型数据。
4. Especially in recent years, with the development of the database and computer network technique, computer users in different districts and countries can share many valuable information resources through the network.
句中 especially in recent years 和 with the development of the database and computer network technique 都在句中作状语。
译文 特别是近年来数据库技术与计算机网络技术的发展, 使不同地区、不同国家的计算机用户都能通过网络通信共享信息资源。
5. Real-time control is the control of procedure in the process of practical productions where computers are applied.
译文 实时控制是指计算机应用于实际生产过程中的过程控制。
6. ...as CAM, CAD and CAI being used very widely, complete automation from design to production has been achieved in many fields.
句中 as CAM, CAD and CAI being used very widely 中的 being used 为现在分词的被动语态。
译文 随着 CAM、CAD 和 CAI 的广泛应用, 许多领域实现了从设计到生产全面自动化的过程。
7. Computers can simulate people's feelings and thoughts, replacing part labors of human being.
译文 计算机能模拟人的感觉和思维过程, 取代人的部分劳动。

Exercises to the Text

1. Fill in the blanks according to the text.

- (1) A computer is an electronic equipment which can make _____ and _____ calculation, process information rapidly and automatically.
- (2) Take the speed of calculation for instance, ENIAC could only make calculations _____ times per second; but today, the fastest computer can do _____ times.

- (3) Computers can simulate people's feelings and thoughts, replacing part labors of _____.
 (4) It was in _____ that the first computer of the world was invented in America; it was named ENIAC.
 (5) At present, _____ is the widest field of computer application.

2. Decide whether each of the following statements is true or false according to the text.

- (1) Data processing has become one of the most important fields of computer application.
 (2) With the development of science technique, more and more numerical data comes out.
 (3) The purpose of inventing and developing computer is to make arithmetic calculation rapidly and accurately.
 (4) Only computer users in the same district and country can share valuable information resources through the network.
 (5) Computers can simulate people's feelings and thoughts, replacing all labors of human being.

3. Translate the following words and expressions into Chinese.

- (1) retrieval (2) dispatch (3) adjuvant (4) real-time control
 (5) artificial intelligence (6) CAM (7) CAD (8) CAI

4. Translate the following paragraph into Chinese.

With the development of science and technology, more and more information including numerical data and none-numerical data comes out. At present, data processing is the widest field of computer application. Production management, data counting, office automation, traffic dispatching, information retrieval all belong to this field. Especially in recent years, with the development of database and computer network technique, computer users in different districts and countries can share many valuable information resources through the network.



Text 2 The Evolution of Computers (计算机的发展)

Many of you probably can't remember the days without computers; but for some of us, computers were virtually unknown when we were born and have rapidly come of age during our lifetime. Computers are widely used in scientific calculation, information processing, CAD/CAM, process control, modern communication, and so on.

Modern electronic computers didn't appear until the 1940s.^[1] Research workers in America produced a working computer in 1946. The early models were very bulky because they depended on vacuum tubes similar to those you may have seen in old radio sets. Later machines used transistors, and at present we use integrated circuits, which take up very little space.

Now, let's get a clearer picture of the development of computers.

The first-generation computers

The first-generation computers were used from 1946 to 1959. They were characterized by the most prominent feature of the ENIAC-vacuum tubes, and were large, costly, expensive to power and often unreliable. Moreover, the vacuum tubes were fairly large, and they generated so much heat that special air-conditioning had to be installed to cool them.^[2]

The second-generation computers

The second-generation computers were used from 1959 to 1964. The most notable change was that transistors had replaced vacuum tubes, which allowed the production of more powerful, reliable and less expensive computers.^[3] Compared with those using vacuum tubes, these computers occupy less space and give off less heat.

In addition, the second-generation computers were given auxiliary storage (sometimes called external or secondary storage). Data were stored outside the computer on either magnetic tapes or disks. Using magnetic tapes or disks for input and output operations increased the speed of the computer.

The third-generation computers

The third-generation computers lasted from 1964 to 1971. They were marked chiefly by the development of integrated circuits, which replaced transistors.^[4] With integrated circuits, hundreds of electrical components could be put on one silicon chip less than one-eighth-inch square. Therefore, the computers became even smaller while their memory capacities became larger.

The third-generation computers worked so quickly that they had the capability to run more than one program concurrently (multiprogramming). For example, at any given time the computer might be printing payroll checks, accepting orders, and testing programs.

The fourth-generation computers

In 1971, we started to have the fourth-generation computers. Most computer vendors classified their computers as the fourth-generation computers, and a few even called them “the fifth-generation”. While the first three generations were characterized by significant technology breakthroughs in electronics—first the use of vacuum tubes, then transistors, and then integrated circuits, chip circuitry had become increasingly miniaturized in the fourth-generation computers. Large scale integrated circuits (LSI) characterized by thousands of electronic components putting on a single silicon chip became common during the 1970s.

Microprocessor chips can manage the functions of the computer, perform calculations and control other devices just like large computers.

The modern microcomputer consists of a microprocessor and other densely packed chips used for storage and input/output operations, all of which are more powerful than large computers of earlier generations.^[5]

Now, LSI has already been upgraded into VLSI (very large scale integrated circuit), which means stronger capabilities in smaller packages.

New Words and Expressions

evolution [i:və'lu:ʃən] *n.* 进展, 发展; 进化

virtually ['vɜ:tʃuəli] *adv.* 事实上, 实质上

bulky ['bʌlki] *adj.* 庞大的, 体积大的

vacuum ['vækjuəm] *n.* 真空

prominent ['prɒmɪnənt] *adj.* 突出的, 卓越的

costly ['kɒstli] *adj.* 过于昂贵的; 代价高的

auxiliary [ɔ:g'ziljəri] *adj.* 辅助的; 备用的

silicon ['silikən] *n.* 硅, 硅元素

unreliable [ˌʌnrɪˈlaɪəbl] *adj.* 不可靠的
 magnetic [mægˈnetɪk] *adj.* 磁的, 有磁性的; 有吸引力的
 component [kəmˈpəʊnənt] *n.* (机器或系统的)零件; 成分; 组成部分
 notable [ˈnəʊtəbəl] *adj.* 值得注意的, 显著的
 concurrently [kənˈkʌrəntli] *adv.* 并存地, 同时发生地
 payroll check 工资单
 vendor [ˈvendə] *n.* 小贩, 卖主
 breakthrough [ˈbreɪkθru:] *n.* 突破
 large-scale *adj.* 大规模的, 大范围的, 大批的
 integration [ˌɪntɪˈgreɪʃən] *n.* 集成, 整合, 综合
 densely [ˈdensli] *adv.* 密集地, 浓密地
 miniaturize [ˈmɪniətʃəraɪz] *v.* 使小型化
 LSI (large scale integrated circuit) 大规模集成电路
 VLSI (very large scale integrated circuit) 超大规模集成电路

Notes to the Text

- Modern electronic computers didn't appear until the 1940s.
 句中 not...until...表示“直到……才……”。
 例如: He didn't begin to do his homework until his mother returned. 直到他妈妈回来, 他才开始做作业。
译文 现代的电子计算机直到 20 世纪 40 年代才问世。
- Moreover, the vacuum tubes were fairly large, and they generated so much heat that special air-conditioning had to be installed to cool them.
 句中 so...that...表示“如此……以至于……”, that 后面接结果状语从句。
 例如: The case is so heavy that I can't lift it. 这个箱子这么重, 我提不起来。
译文 此外, 体积庞大的真空管产生很大的热量, 必须安装特殊的空调来降温。
- ...which allowed the production of more powerful, reliable and less expensive computers.
 句中 which allowed...是定语从句, 进一步说明 computers 的特点。
译文 使用电子管代替晶体管可以制造出功能更强、性能更可靠、价格更便宜的计算机。
- They were marked chiefly by the development of integrated circuits, which replaced transistors.
 句中 which replaced transistors 为 integrated circuits 的定语从句。
译文 它们(第三代计算机)以集成电路取代晶体管为主要标志。
- The modern microcomputer consists of a microprocessor and other densely packed chips used for storage and input/output operations, all of which are more powerful than large computers of earlier generations.
 句中 used for storage and input/output operations 是 densely packed chips 的定语, 而句中 all of which are more powerful than large computers of earlier generations 是 the modern microcomputer 的定语从句。
译文 微处理器和其他用于存储及输入/输出操作的集成芯片相结合, 构成了现代微型计算机。微型计算机比前几代大型计算机的功能更为强大。

1. Decide whether each of the following statements is true or false according to the text.

- (1) There have been four generations of computer products: Pentium 1 (奔腾第一代), Pentium 2, Pentium 3 and Pentium 4.
- (2) The first digital computer was invented in 1964.
- (3) Minicomputers have made it possible for persons and families to afford computers.
- (4) With the development of science and technology, the size of computers have become smaller, and meanwhile the function more powerful.
- (5) The first computer was not created in the USA.

(1) The second generation of computers _____.
A. use transistors
B. use vacuum tubes
C. are characterized by significant technological breakthroughs in artificial intelligence
D. use LSI

- (2) The appearance age of the first computer was _____.
A. 1940s B. 1950s C. 1970s D. 1960s
- (3) The first country that invented the computer was _____.
A. USA B. China C. Japan D. Germany
- (4) The second generation of computers were used from _____ to _____.
A. 1946; 1959 B. 1959; 1964 C. 1964; 1971 D. 1971; 2007
- (5) Most microcomputers today are developed from the design of _____.
A. APPLE B. NEC C. ENAIC D. Compaq

(1) 真空管 (2) 晶体管 (3) 磁带 (4) 磁盘
(5) 微处理器 (6) 大规模集成电路 (7) 微机 (8) 辅存

In 1971, we started to have the fourth-generation computers. Most computer vendors classified their computers as the fourth-generation computers, and a few even called them “the fifth- generation” . While the first three generations were characterized by significant technology breakthroughs in electronics — first the use of vacuum tubes, then transistors, and then integrated circuits, chip circuitry had become increasingly miniaturized in the fourth-generation computers. Large scale integrated circuits (LSI) characterized by thousands of electronic components on a single silicon chip became common during the 1970s.

Components of Computer System (计算机系统的组成)

A computer system consists of both hardware and software systems. Now, let's get a clearer picture of the components of the computer system.

Hardware

A hardware consists of host and peripherals. It is not an abstract concept or instruction, but indeed contains physical parts and related devices, such as IC, cable, power, storage and terminal.^[1] A brief introduction to the primary parts of a hardware system is given below.

CPU

CPU (central processing unit) is the heart of the hardware system used for performing fundamental data operation and various controlling operations. CPU is made up of a unit called arithmetic logic unit (ALU) and related circuits, an instruction counter and a decoder controller. Super LSI is used in CPU and controller. ALU and some registers are made on a micro-processing chip. The main function of CPU is to control each component working coordinately upon the request of instructions, executing instructions and processing data.

Host

In a microcomputer, CPU (also called microprocessor) and main memory are generally called a host. According to the level of microprocessors, a host can be divided into 8086, 80286, 80386, 80486, Pentium (80586), etc, from a lower level to a higher one.^[2] Whether the level of micros is high or low is mainly determined by the run-speed of micro-processors and the storage capacity of the main memory. The higher the level is, the bigger the speed and the larger the storage capacity is.

Storage

A storage is the part that stores programs, original data and intermediary results. Its basic function is to put in (write in) or to take out (read out) information into or from the given place. It stores information primarily by recording the electric pulse being on or off. It's divided into internal and external storages.

Internal storage

The internal storage (also called main memory) is a fast storage linked to ALU and controller to access information electronically. There are two internal storages in all computers: RAM (random access memory) and ROM (read-only memory). When data and programs are written into or read out from storage through computers, RAM will change its status. However, ROM is designed to be read only and remain unchangeable. Information can't be written into ROM.

External storage

External storages are those components that are put outside mainframe with great capacity and slow access speed. As a supplementary unit to internal storages, they are designed to exchange information in batches rather than with CPU. Examples of external storages are disks (floppy and rigid disks) and CDs.

Input devices

Input devices are those components through which programs and data are put into computers. They may convert computational programs, original data and certain characters which are shown in the form of familiar information (e.g. words, images, sound) into digital signals represented by binary codes (0 and 1). Keyboard, mouse, light pen, scanner, digital camera and language inputs are common input devices.

Output devices

Output devices are those components through which processed results are output to users.^[3] Words,

numbers, images and sound information are converted from binary codes to people after being processed by micros. Common examples are display, drafter, printer, and language outputs.

Software

Unlike hardware, software is not a touchable object but a series of instructions to control computers through a certain processing procedure. It includes various programs necessary in computer operation, various user's manuals and technical materials related to the operation. The software system can be divided into two parts: application software and system software.

Application software

Application software consists of various programs that are developed and designed to solve specific and practical problems, such as word processing (e. g. WPS 2000, Word 97), financial management, CAD, CAT, electronic games.

System software

The main function of system software is to help users manage hardware, dispatch programs, execute the command of users, facilitate the operation, maintain and develop computers as well. It includes operating systems, computer language processors, monitoring programs, diagnostic programs, and utility programs. It also contains database and database management systems.

Operating system

Operating system (OS) is the heart of system software and is used for managing hardware and software resources and monitoring the execution of programs.^[4] It's an interface between users and computers. The examples of OS are DOS, CP/M, Windows 98, UNIX, NetWare 4.1, etc.

Computer language processor

Computer language processor is a tool for developing application software used for supporting the operation of computer language in a computer system.^[5]

Utility programs

Utility programs are specific programs used for improving the application capability of computers and extending their application area.^[6]

New Words and Expressions

host [həʊst] *n.* 主机

peripheral [pə'rɪfərəl] *n.* 外围设备

concept ['kɒnsept] *n.* 观念, 概念

brief [bri:f] *adj.* 简短的, 短暂的

primary ['praɪməri] *adj.* 主要的, 初步的

coordinate [kəʊ'ɔ:dɪneɪt] *v.* 使协调, 使相配合

intermediary [ɪntə'mɪ:diəri] *n.* 调解者, 中间物

internal [ɪn'tɜ:nl] *adj.* 内在的; 固有的

electronically [ɪ,lek'trɒnikli] *adv.* 电子地

supplementary [sʌpli'mentri] *adj.* 增补性的, 补充性的

floppy ['flɒpi] *adj.* 松软的

rigid ['rɪdʒɪd] *adj.* 刚硬的; 严格的

digital ['dɪdʒɪtl] *adj.* 数字的, 数码的

drafter ['dra:ftə] *n.* 制图者, 制图仪
 manual ['mænjuəl] *n.* 使用手册, 说明书
 specification [ˌspesifi'keɪʃn] *n.* 规格, 说明书
 specific [spə'sifik] *adj.* 明确的, 特定的
 diagnostic [ˌdaɪəg'nɒstɪk] *adj.* 诊断的
 utility [ju:'tɪləti] *n.* 效用, 实用; [计]应用程序, 实用程序
 CPU (central processing unit) 中央处理器
 ALU (arithmetic logic unit) 算术逻辑单元
 IC (integrated circuit) 集成电路
 CAT (computer aided technology) 计算机辅助技术
 OS (operating system) 操作系统

Notes to the Text

1. It is not an abstract concept or instruction, but indeed contains physical parts and related devices, such as IC, cable, power, storage and terminal.

句中 IC (integrated circuit) 意为集成电路, 装在一小片硅片上, 它的部件完全结合在一起, 不能分组或用其他方法重新分配, 但仍然有一定的电子功能。cable 意为电缆, 是指由一条导线和相互绝缘的多条导线和护套构成的信号传输线。terminal 意为终端硬件设备, 放在通信网络的进出点上, 用来输入或获取数据。

译文 它不是抽象的概念或指令, 而是由实实在在的物理部件及相关设备组成的, 如集成电路板、电缆、电源、存储器和终端等。

2. According to the level of microprocessors, a host can be divided into 8086, 80286, 80386, 80486, Pentium(80586), etc, from a lower level to a higher one.

句中 8086、80286、80386、80486 分别是 Intel 公司的前四代处理器的名称。Pentium(80586) 奔腾(80586)是 Intel 第五代微处理器, 俗称“586”。

译文 主机按其微处理器的档次由低到高可分为: 8086、80286、80386、80486、奔腾(80586)等。

3. Output devices are those components through which processed results are output to users.

译文 输出设备是微型计算机向用户输出处理结果的设备。

4. Operating system (OS) is the heart of system software and is used for managing hardware and software resources and monitoring the execution of programs.

译文 操作系统是系统的核心, 用以管理计算机软硬件资源和监控程序执行的软件系统。

5. Computer language processor is a tool for developing application software used for supporting the operation of computer language in a computer system.

译文 计算机语言处理器用以支持计算机语言在计算机系统上的运行, 是开发应用软件的工具。

6. Utility programs are specific programs used for improving the application capability of computers and extending their application area.

译文 系统实用程序是增强计算机的实用能力并扩大其应用范围的专用程序。

Exercises to the Text

1. Translate the following words and phrases into English.

- | | | | |
|-----------|-----------|--------------|---------|
| (1) 只读存储器 | (2) 随机存储器 | (3) 超大规模集成电路 | (4) 主机 |
| (5) 外围设备 | (6) 软盘 | (7) 硬盘 | (8) 二进制 |

2. Translate the following words and phrases into Chinese.

- | | | | |
|---------|-------------|-------------------------|---------|
| (1) CPU | (2) CAD | (3) CAT | (4) IC |
| (5) OS | (6) Pentium | (7) instruction counter | (8) ALU |

3. Answer the following questions according to the text.

- (1) Please give a brief picture of the components of the computer system.
- (2) Please write out several input and output devices.
- (3) Please write out some application software used for word processing.
- (4) Please write out some system software that you know.
- (5) What's computer language processor?

4. Translate the following paragraph into Chinese.

Computer language processor is a tool for developing application software used for supporting the operation of computer language in a computer system.

Unit Two Hardware Knowledge (硬件知识)



Text 1

CPU (中央处理器)

The central processing unit (CPU) is the heart of the computer system. Its configuration determines whether a computer is fast or slow in relation to other things.^[1] The CPU is the most complex computer system component, responsible for directing most of the system activities based on the instructions provided.^[2] As computers evolve, they become smaller and smaller while their speed and capacity increase tremendously.^[3] These changes have resulted in the microcomputer that is small enough to fit your desk or on your lap.^[4] The CPU circuitry in a microcomputer, called a microprocessor, fits on a chip about the size of your thumbnail or even smaller.

The CPU has two main parts: the control unit and the arithmetic logic unit(ALU). They are usually connected by an electronic component referred to as a bus, which acts as an electronic highway between them.^[5] To temporarily store data and instructions, the CPU has specific storage devices called registers.

Control unit

The control unit, a maze of complex electronic circuitry, is responsible for directing and coordinating most of the computer system's activities. It does not execute instructions itself; it tells other parts of the computer system what to do. It determines the movement of electronic signals between the main memory and the arithmetic logic unit, as well as the control signals between the CPU and input/output devices.

Just as a car is useless without gas, a computer is not much good without software instructions. We usually write software with high-level language. These languages are converted by a translation software into a low-level form of language that the computer can work with — machine language, the only language that the CPU can understand.^[6] In machine language, data and instructions are represented in binary form (0s and 1s), and each type of computer — microcomputer, minicomputer, or mainframe responds to a unique version. Once the instructions have been converted into this form, they can be retrieved from the main memory and interpreted by the control unit (sometimes referred to as