21世纪高等学校计算机规划教材

21st Century University Planned Textbooks of Computer Science

计算机英语

（第2版）

Computer English (2nd Edition)

司爱侠 张强华 编著

- 计算机英语畅销书作者的最新力作
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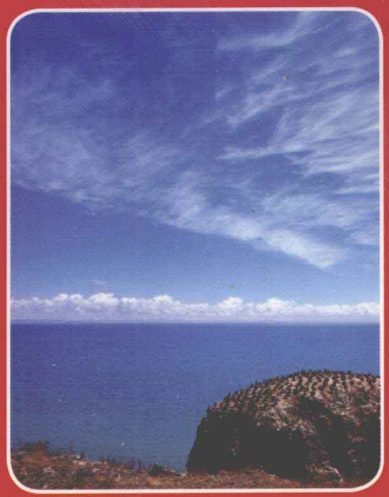

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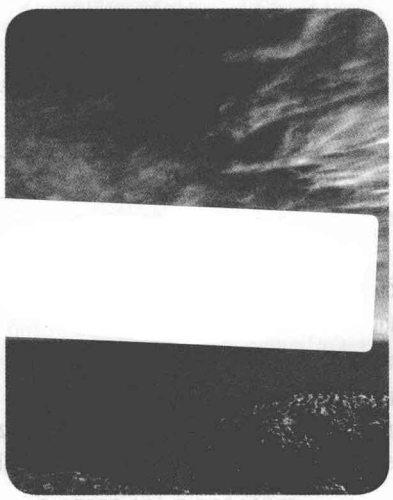

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内 容 提 要

本书是为培养计算机人才的专业英语能力而编写的教材，主要内容包括：计算机硬件和软件基础、外部设备、操作系统、数据结构、C语言、数据库、面向对象编程、计算机网络、因特网及其相关技术、多媒体、网络安全、云计算以及物联网等。

全书以单元为单位，每个单元由以下几部分组成：课文——选材广泛，风格多样，切合实际；单词——给出课文中出现的新词，读者由此可以积累专业的基本词汇；常用词组——给出本单元所涉及的常用词组；难句讲解——讲解课文中出现的疑难句子，培养读者的阅读理解能力；习题——针对课文的练习，巩固学习效果，其中的真题再现由作者遴选历年软件水平考试专业英语试题，并提供参考答案，这对参加这些考试的读者十分有用；练习答案——供读者对照检查。

本书既可作为高等院校计算机相关专业、网络专业、电子商务专业、信息管理专业的教材，也可供相应的培训班使用或作为相关技术人员的自学教材。

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计算机英语（第2版）

◆ 编　　著　司爱侠　张强华
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第 2 版前言

本书出版后承蒙读者厚爱，在此深表感谢。本次修订主要进行了以下工作：

1. 在前 12 单元中均增加“阅读材料”。其内容与单元整体内容相一致，但难度略低，适合读者自主阅读。同时以脚注的形式作了注释，帮助读者理解文章和扩大知识面。

2. 增加了 2 个单元，内容分别为“云计算”和“物联网”，力求跟上计算机技术的新进展。

3. 取消第 1 版的“附录 参考答案”，改为只向教师提供。自学者可以与我们联系获取。新增“附录 A 词汇总表”和“附录 B 计算机英语词汇特点及翻译技巧”。

4. 开通新浪微博，以便及时与读者沟通。微博名为：行业英语 ESP，访问地址是 http://weibo.com/1954359960。

编 者

2011 年 12 月

前　言

计算机技术是信息技术领域中最核心的部分。它具有高速的成长性、快速的发展能力和不断变化的特征，因此，需要从业人员掌握许多新技术、新方法。这个领域对从业人员的专业英语要求很高，具备相关职业技能并精通外语的人员往往处于竞争的优势地位，成为职场中不可或缺的核心人才。本书就是为培养计算机人才的专业英语能力而编写的教材。

本书按照大学专业英语要求，根据作者多年的教学经验，结合工作实际精心编排而成，内容全面，软件、硬件和网络并重，同时兼顾发展热点。本书选材新颖，包含大量实用的内容。读者可以学习到目前常用的、较新的基本知识，以便学以致用。全书遵循“E-learn”教学理念，有适当的开放性练习，以培养读者的创造性学习能力和综合素质。

我们为使用本书的教师提供支持，包括电子教案、参考试卷等，如有需要请登录人民邮电出版社教学服务与资源网（http://www.ptpedu.com.cn）免费下载。在使用本书过程中，读者如有任何问题，都可以通过电子邮件与我们交流，也可通过出版社与我们联系，我们一定会给予答复。如果读者没有收到我们的回复，请再次联系。邮件标题请注明姓名及“计算机英语（人民邮电版）”字样，否则会被当做垃圾邮件删除。

望大家不吝赐教，我们的电子邮件地址如下：

zqh3882355@163.com；cici12323@tom.com

尽管在本书编写过程中，作者花费了大量的精力，但由于计算机领域的发展日新月异，加之作者水平有限，书中难免存在疏漏之处，敬请各位读者批评指正。

编　者

2008 年 6 月

目 录

Unit 1

Text A
How Computers Work

A general-purpose computer has four main sections: the arithmetic and logic unit (ALU), the control unit, the memory, and the input and output devices, collectively termed I/O. These parts are interconnected by buses, often made of groups of wires.

The control unit, ALU, registers, and basic I/O, and often other hardware closely linked with these, are collectively known as a central processing unit (CPU). Early CPUs were comprised of many separate components but since the mid-1970s CPUs have typically been constructed on a single integrated circuit called a microprocessor.

1. Control unit

The control unit, often called a control system or central controller, directs the various components of a computer. It reads and interprets instructions in the program one by one. The control system decodes each instruction and turns it into a series of control signals that operate the other parts of the computer. Control systems in advanced computers may change the order of some instructions so as to improve performance.

A key component common to all CPUs is the program counter, a special memory cell that keeps track of which location in memory the next instruction is to be read from.[1]

The control system's functions are as follows. Note that this is a simplified description and some of these steps may be performed concurrently or in a different order depending on the type of CPU:

- Read the code for the next instruction from the cell indicated by the program counter.
- Decode the numerical code for the instruction into a set of commands or signals for each of the other systems.
- Increment the program counter so it points to the next instruction.
- Read whatever data the instruction requires from cells in memory, or perhaps from an input device. The location of this required data is typically stored within the instruction code.
- Provide the necessary data to an ALU or register.
- If the instruction requires an ALU or specialized hardware to complete, instruct the hardware to perform the requested operation.

- Write the result from the ALU back to a memory location or to a register or perhaps an output device.
- Jump back to the first step.

Since the program counter is conceptually just another set of memory cells, it can be changed by calculations done in the ALU. Adding 100 to the program counter would cause the next instruction to be read from a place 100 locations further down the program. Instructions that modify the program counter are often known as "jumps" and allow for loops and often conditional instruction execution.

It is noticeable that the sequence of operations that the control unit goes through to process an instruction is in itself like a short computer program.[2] And indeed, in some more complex CPU designs, there is another yet smaller computer called a microsequencer that runs a microcode program that causes all of these events to happen. [3]

2. Arithmetic and Logic Unit (ALU)

The ALU is capable of performing two classes of operations: arithmetic and logic.

The set of arithmetic operations that a particular ALU supports may be limited to adding and subtracting or might include multiplying or dividing, trigonometry functions and square roots. Some can only operate on integers whilst others use floating point to represent real numbers. However, any computer that is capable of performing just the simplest operations can be programmed to break down the more complex operations into simple steps that it can perform. Therefore, any computer can be programmed to perform any arithmetic operation, although it will take more time to do so if its ALU does not directly support the operation. [4] An ALU may also compare numbers and return Boolean values depending on whether one is equal to, greater than or less than the other.

Logic operations involve Boolean logic: AND, OR, XOR and NOT. These can be useful both for creating complicated conditional statements and processing Boolean logic.

Superscalar computers contain multiple ALUs so that they can process several instructions at the same time. Graphics processors and computers with SIMD and MIMD features often provide ALUs that can perform arithmetic on vectors and matrices.

3. Memory

A computer's memory can be viewed as a list of cells into which numbers can be placed or read. Each cell has a numbered "address" and can store a single number. The computer can be instructed to "put the number 123 into the cell numbered 1357" or to "add the number that is in cell 1357 to the number that is in cell 2468 and put the answer into cell 1595". The information stored in memory may represent practically anything. Letters, numbers, even computer instructions can be placed into memory with equal ease. Since the CPU does not differentiate between different types of information, it is up to the software to give significance to what the memory sees as nothing but a series of numbers. [5]

In almost all modern computers, each memory cell is set up to store binary numbers in groups of eight bits, called a byte. Each byte is able to represent 256 different numbers; either from 0 to 255 or −128 to +127. To store larger numbers, several consecutive bytes may be used, typically, two, four or eight. When negative numbers are required, they are usually stored in two's complement notation. Other

arrangements are possible, but are usually not seen outside of specialized applications or historical contexts. A computer can store any kind of information in memory as long as it can be somehow represented in numerical form. Modern computers have billions or even trillions of bytes of memory.

The CPU contains a special set of memory cells called registers that can be read and written to much more rapidly than the main memory area. There are typically between two and one hundred registers depending on the type of CPU. Registers are used for the most frequently needed data items to avoid having to access main memory every time data is needed. Since data is constantly being worked on, reducing the need to access main memory, which is often slow compared to the ALU and control units, greatly increases the computer's speed. [6]

Computer main memory comes in two principal varieties: random access memory or RAM and read-only memory or ROM. RAM can be read and written to anytime the CPU commands it, but ROM is pre-loaded with data and software that never changes, so the CPU can only read from it. ROM is typically used to store the computer's initial start-up instructions. In general, the contents of RAM are erased when the power to the computer is turned off while ROM retains its data indefinitely. In a PC, the ROM contains a specialized program called the BIOS that orchestrates loading the computer's operating system from the hard disk drive into RAM whenever the computer is turned on or reset. In embedded computers, which frequently do not have disk drives, all of the software required to perform the task may be stored in ROM. Software that is stored in ROM is often called firmware because it is notionally more like hardware than software. Flash memory blurs the distinction between ROM and RAM by retaining data when turned off but being rewritable like RAM. However, flash memory is typically much slower than conventional ROM and RAM so its use is restricted to applications where high speeds are not required.

In more sophisticated computers there may be one or more RAM cache memories which are slower than registers but faster than main memory. Generally computers with this sort of cache are designed to move frequently needed data into the cache automatically, often without the need for any intervention on the programmer's part.

4. Input/Output (I/O)

I/O is the means by which a computer receives information from the outside world and sends results back. Devices that provide input or output to the computer are called peripherals. On a typical personal computer, peripherals include inputs like the keyboard and mouse, and outputs such as the display and printer. Hard disks, floppy disks and optical discs serve as both inputs and outputs. Computer network is another form of I/O.

Often, I/O devices are complex computers in their own right with their own CPU and memory. A graphics processing unit might contain fifty or more tiny computers that perform the calculations necessary to display 3D graphics. Modern desktop computers contain many smaller computers that assist the main CPU in performing I/O.

New Words

purpose	['pə:pəs]	*n.* 目的，意图，用途
arithmetic	[ə'riθmətik]	*n.* 算术，算法
memory	['meməri]	*n.* 存储器，内存
input	['input]	*n.* & *v.* 输入
output	['autput]	*n.* 输出
device	[di'vais]	*n.* 设备，装置
interconnect	[ˌintə:kə'nekt]	*vt.* 使互相连接
bus	[bʌs]	*n.* 总线
wire	['waiə]	*n.* 金属丝，电线
hardware	['hɑ:dwɛə]	*n.* 硬件
comprise	[kəm'praiz]	*v.* 包含，由……组成
separate	['sepərit]	*adj.* 分开的，分离的，个别的，单独的
component	[kəm'pəunənt]	*n.* 部件；成分，部分
construct	[kən'strʌkt]	*vt.* 建造，构造，创立
microprocessor	[ˌmaikrəu'prəusesə]	*n.* 微处理器
direct	[di'rekt]	*v.* 指导，指挥
concurrently	[kən'kʌrəntli]	*adv.* 并列地，并行地；同时发生地
instruction	[in'strʌkʃən]	*n.* 指令
program	['prəugræm]	*n.* 程序
decode	[ˌdi:'kəud]	*vt.* 解码，译码
signal	['signl]	*n.* 信号
		adj. 信号的
		v. 发信号
operate	['ɔpəreit]	*v.* 操作，运转
location	[ləu'keiʃən]	*n.* 地点，位置
function	['fʌŋkʃən]	*n.* 功能，作用；函数
perform	[pə'fɔ:m]	*vt.* 履行，执行
type	[taip]	*n.* 类型，字型
		v. 打字
cell	[sel]	*n.* 单元，电池
increment	['inkrimənt]	*n.* 增加，增量
point	[pɔint]	*vi.* 指，指向，表明
register	['redʒistə]	*n.* 寄存器
		v. 记录，登记，注册
counter	['kauntə]	*n.* 计数器
modify	['mɔdifai]	*vt.* 更改，修改
jump	[dʒʌmp]	*n.* 跳转

loop	[lu:p]	*n.* 循环
conditional	[kən'diʃnəl]	*adj.* 有条件的
execution	[ˌeksi'kju:ʃən]	*n.* 实行，完成，执行
sequence	['si:kwəns]	*n.* 次序，顺序，序列
microsequencer	['maikrəu'si:kwəns]	*n.* 微序列器
microcode	['maikrəkəud]	*n.* 微码
logic	['lɔdʒik]	*n.* 逻辑，逻辑学，逻辑性
subtract	[səb'trækt]	*vt.* 减去
integer	['intidʒə]	*n.* 整数
Boolean	['bu:liən]	*adj.* 布尔的
statement	['steitmənt]	*n.* 语句
multiple	['mʌltipl]	*adj.* 多样的，多重的 *n.* 倍数，若干 *v.* 成倍增加
processor	['prəusesə]	*n.* 处理器，处理机
vector	['vektə]	*n.* 向量，矢量
matrix	['meitriks]	*n.* 矩阵
address	[ə'dres]	*n.* 地址
differentiate	[difə'renʃieit]	*v.* 区分，区别，分辨
significance	[sig'nifikəns]	*n.* 意义，重要性
binary	['bainəri]	*adj.* 二进制的
byte	[bait]	*n.* 字节
consecutive	[kən'sekjutiv]	*adj.* 连续的，连贯的，顺序的
negative	['negətiv]	*n.* 否定，负数
complement	['kɔmplimənt]	*n.* 补码
arrangement	[ə'reindʒmənt]	*n.* 排列，安排
rapidly	['ræpidli]	*adv.* 快速地，迅速地
constantly	['kɔnstəntli]	*adv.* 经常地，不断地
variety	[və'raiəti]	*n.* 变化，变量；种类
random	['rændəm]	*adj.* 随机的 *n.* 随意，任意
initial	[i'niʃəl]	*adj.* 最初的，初始的
erase	[i'reiz]	*vt.* 删除，抹去，擦掉
retain	[ri'tein]	*vt.* 保持，保留
orchestrate	['ɔ:kistreit]	*vt.* 使和谐地结合起来；配合
reset	[ri:'set]	*vt.* 复位，重新启动
embed	[im'bed]	*vt.* 嵌入
firmware	['fə:mˌwɛə]	*n.* 固件，韧件（软件硬件相结合）
blur	[blə:]	*v.* 模糊
conventional	[kən'venʃənl]	*adj.* 惯例的，常规的

restricted	[ris'triktid]	*adj.* 受限制的，有限的
cache	[kæʃ]	*n.* 高速缓存
automatically	[ɔ:tə'mætikli]	*adv.* 自动地
intervention	[ˌintə'venʃən]	*n.* 干涉，介入
receive	[ri'si:v]	*vt.* 收到，接到，接收
peripheral	[pə'rifərəl]	*n.* 外围设备
		adj. 外围的
keyboard	['ki:bɔ:d]	*n.* 键盘
mouse	[maus]	*n.* 鼠标
display	[di'splei]	*n.* 显示，显示器
printer	['printə]	*n.* 打印机
interface	['intəfeis]	*n.* 界面，接口
tiny	['taini]	*adj.* 很少的，微小的
calculation	[ˌkælkju'leiʃən]	*n.* 计算

Phrases

integrated circuit	集成电路
central controller	中央控制器
keep track of	跟踪；明了
depend on	依靠，依赖
a set of	一组，一套
trigonometry function	三角函数
square root	平方根
floating point	浮点数
real number	实数
break down	分解
equal to	等于
greater than	大于
less than	小于
logic operation	逻辑运算
superscalar computer	超级计算机
set up	设置
as long as	只要，在……的时候
turn off	关机
hard disk drive	硬盘驱动器
turn on	开机
flash memory	闪存
personal computer	个人计算机，缩写为 PC
floppy disk	软盘

optical disc	光盘
desktop computer	台式计算机

Abbreviations

ALU	算术逻辑单元；运算器（Arithmetic and Logic Unit）
CPU	中央处理器（Central Processing Unit）
SIMD	单指令多数据（Single Instruction Multiple Data）
MIMD	多指令多数据（Multiple Instruction Multiple Data）
RAM	随机存取存储器（Random Access Memory）
ROM	只读存储器（Read-Only Memory）
BIOS	基本输入输出系统（Basic Input Output System）

Notes

[1] A key component common to all CPUs is the program counter, a special memory cell that keeps track of which location in memory the next instruction is to be read from.

本句中，a special memory cell that keeps track of which location in memory the next instruction is to be read from 是一个名词性短语，对 the program counter 进行补充说明。在该短语中，that keeps track of which location in memory the next instruction is to be read from 是一个定语从句，修饰和限定 a special memory cell。keep track of 的意思是“跟踪；明了”。

[2] It is noticeable that the sequence of operations that the control unit goes through to process an instruction is in itself like a short computer program.

本句中，It 是形式主语，真正的主语是 that 引导的从句 the sequence of operations that the control unit goes through to process an instruction is in itself like a short computer program。在该从句中，the sequence of operations 是主语，is like a short computer program 是谓语，that the control unit goes through to process an instruction 是一个定语从句，修饰和限定 the sequence of operations，动词不定式短语 to process an instruction 作目的状语，修饰 goes through。in itself 的意思是“本身，实质上”。

[3] And indeed, in some more complex CPU designs, there is another yet smaller computer called a microsequencer that runs a microcode program that causes all of these events to happen.

本句中，called a microsequencer 是一个过去分词短语，作定语，修饰和限定 another yet smaller computer。that runs a microcode program 是一个定语从句，修饰和限定 a microsequencer，that causes all of these events to happen 也是一个定语从句，修饰和限定 a microcode program。

[4] Therefore, any computer can be programmed to perform any arithmetic operation, although it will take more time to do so if its ALU does not directly support the operation.

本句中，although it will take more time to do so if its ALU does not directly support the operation 是一个让步状语从句。在该从句中，if its ALU does not directly support the operation 是一个条件状语从句。so 指 perform any arithmetic operation。

[5] Since the CPU does not differentiate between different types of information, it is up to the software to give significance to what the memory sees as nothing but a series of numbers.

本句中，句型 It is up to sb. to do sth.的意思是“由某人来做某事”。请看下例：

It is not up to you to decide what you should do next.

下一步该做什么你们说了不算。

significance 的意思是“意义”、“重要性”；nothing but 等于 nothing else than，意思是“只，不过”。请看下例：

What he said is of no significance, nothing but nonsense.

他说的话毫无意义，简直就是一派胡言。

[6] Since data is constantly being worked on, reducing the need to access main memory, which is often slow compared to the ALU and control units, greatly increases the computer's speed.

本句中，Since data is constantly being worked on 是一个原因状语从句，reducing the need to access main memory 是动名词短语作主语，which is often slow compared to the ALU and control units 是一个非限定性定语从句，对 main memory 进行补充说明，which 指 main memory。

Exercises

〖Ex. 1〗根据课文内容回答问题

(1) How many main sections does a general-purpose computer have? What are they? And how are they interconnected?

(2) What is the control unit often called?

(3) Please list the functions of the control system.

(4) What are the two classes of operations ALU is capable of performing?

(5) What do logic operations involve?

(6) What can a computer's memory be viewed as? What does each of them have?

(7) What are the two principal varieties of computer main memory?

(8) In a PC, what does the specialized program called BIOS do?

(9) Why is the software that is stored in ROM often called firmware?

(10) What is I/O?

〖Ex. 2〗根据下面的英文解释，写出相应的英文词汇

(1) _____: Information put into a communications system for transmission or into a computer system for processing.

(2) _____: An integrated circuit that contains the entire central processing unit of a computer on a single chip.

(3) _____: An instruction sequence in programmed instruction.

(4) _____: A parallel circuit that connects the major components of a computer, allowing the transfer of electric impulses from one connected component to any other.

(5) _____: A computer and the associated physical equipment directly involved in the performance of data-processing or communications functions.

(6) _____: A unit of a computer that preserves data for retrieval.

(7) _____: The information produced by a computer from a specific input.

(8) _____: A basic unit of storage in a computer memory that can hold one unit of information, such as a character or word.

(9) _____: A part of the central processing unit where groups of binary digits are stored as the computer is processing them.

(10) _____: A number used in information storage or retrieval that is assigned to a specific memory location.

〖Ex. 3〗把下列句子翻译为中文

(1) He went to town with the purpose of buying a new computer.

(2) Most online services have their own browsers.

(3) Floppy disk may be double-density or high-density.

(4) The formula then includes the addresses of the cells.

(5) C might best be described as a "medium level language".

(6) Every browser has the built-in ability to understand HTML.

(7) C is one of the most popular computer languages in the world.

(8) Java technology is both a programming language and a platform.

(9) In fact, a window manager can be thought of as a GUI for a CLI OS.

(10) A database management system handles user requests for database action.

〖Ex. 4〗选择适当的答案填空（真题再现　2007 年 11 月程序员专业英语试题）

(1) A ____ is a functional unit that interprets and carries out instructions.

A. memory　　B. processor　　C. storage　　D. network

(2) A ____ consists of the symbols, characters, and usage rules that permit people to communicate with computer.

A. programming language　　B. network

C. keyboard　　D. display

(3) ____ software, also called end-user program, includes database programs, word processors, spreadsheets etc.

A. Application　　B. System　　C. Compiler　　D. Utility

(4) In ____, the only element that can be deleted or removed is the one that was inserted most recently.

A. a line　　B. a queue　　C. an array　　D. a stack

(5) Most ____ measures involve data encryption and password.

A. security　　B. hardware　　C. display　　D. program

〖Ex. 5〗将下列词填入适当的位置（每词只用一次）

speed	device	other	considered	exists
hardware	effective	operate	moving	designer

A buffer is a data area shared by ___(1)___ devices or program processes that ___(2)___ at different speeds or with different sets of priorities. The buffer allows each ___(3)___ or process to operate without being held up by the ___(4)___. In order for a buffer to be ___(5)___, the size of the