新编

计算机科技英语

黄 坤 任 军 黎娜娜
周 军 冯伟森 潘显萌 编著

A NEW COMPUTER SCIENCE AND TECHNOLOGY ENGLISH

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内容简介

本书精心选辑了近年来国内外一些计算机英文资料的有关内容，按读者学习需要做了必要的改写，并采用中英双栏对照的方式将英文原文全部译出，系统地组织成一本计算机英语基础教程。本书共分九章：计算机基础知识；操作系统和 DOS 操作基础；应用软件指南；学习程序设计；数据库；数字电路；硬件基础；计算机网络与分布式系统；计算机新学科与新技术。

本书编排新颖，每章前有中英对照的导读提要，然后列出本章所涉及到的计算机英语专业单词，全书大约有 2500 左右专业词汇。在每章的后面选辑了一至两篇与本章内容相关的英文阅读材料，附有一定数量的阅读理解选择题，并给出答案。从而帮助读者培养直接使用英文软件和阅读有关英文原版资料的能力。

本书适合于参加各类计算机等级考试的读者自学使用，可作为电脑职业教育的培训教材以及从事计算机专业技术和应用人员的参考书，同时也可作为有关院校计算机专业的教学用书。

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前 言

随着科学技术的迅猛发展，计算机已成为各个学科领域不可缺少的应用工具，并已进入家庭使用。它是当今信息化社会的必然产物。随着我国信息产业的发展，必将进一步推动全社会学习和掌握计算机。为了更好的掌握这一有力工具，必须能够阅读和翻译与计算机有关的英文资料和技术文献。我们在参考了国内外大量计算机英文资料的基础上，编写了这本书。

本书选辑了近年来国内外的一些计算机英文资料的有关内容，采用中英双栏对照的方式，按读者学习需要做了必要的改写，科学地组织成一本计算机英语基础教程。该书编排新颖，每章前先安排有中英对照的导读提要，然后列出了本章所涉及到的计算机英语专业单词，这是读者必须掌握的，在每章的后面选辑了一至两篇与本章内容相关的英文阅读材料，附有一定数量的阅读理解选择题，并给出了参考答案。全书共分九章，第一章计算机基础知识，介绍计算机的历史和基本组成；第二章操作系统和 DOS 操作基础，介绍操作系统和 DOS 的常用命令；第三章应用软件指南，介绍一些常用的工具软件；第四章学习程序设计，叙述了程序设计的概念和常用的程序设计语言；第五章数据库，介绍数据库的概念和 dBASE III 的使用；第六章数字电路，描述了计算机的基本逻辑运算；第七章硬件基础，介绍计算机的主要部件及功能；第八章计算机网络与分布式系统，叙述了计算机网络系统的基本概念；第九章计算机新学科与新技术，介绍了多媒体技术和专家系统等新技术。

参加本书编写的人员有黄坤、任军、黎娜娜、周军、潘显萌和冯伟森。其中，第一、二、三、四章及附录由黄坤编写，第五、七、八、九章由任军编写，黎娜娜编写了第二、四、五、九章的部分内容，并编写了全部练习，冯伟森编写了第六章，周军和潘显萌编写了第一、三、七、八章的部分内容。全书最后由黄坤统稿。

由于作者的水平有限，书中难免会有不妥和错误之处，恳切希望得到广大读者的批评和指正。

编 者

1997.6.9

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Chapter 1 Fundamentals of Computer

第 1 章 计算机基础知识

【**Guide to reading**】This chapter consists of the following: general knowledge of computer, computer system, history of computer and recent development of computers science and technology. This chapter provides the basic vocabulary of the computer science.

【**导读提要**】这部分介绍了计算机的一般常识，主要收录了计算机的组成，计算机的发展史，计算机技术的最新动态等一般性的文章。通过这部分的学习，读者可以掌握关于计算机的最基础词汇。

Vocabulary 词汇

computer	n.电脑，电子计算机	arithmeticlogic unit	算术逻辑部件
manipulate	vt.操纵，利用，操作	keyboard	n.键盘
information	n.消息，信息，知识	printer	n.打印机
hand-hold	a.便携，手拿的	diskette	n.磁盘
calculator	n.计算器	statistical	a.统计的
system	n.系统，体系	joystick	n.游戏棒，操纵杆
scientific	a.科学的，系统的	software	n.软件
electronic	a.电子的	category	n.种类
machinery	a.机器，机关，	simulate	n.模拟，模仿
equipment	n.装备，设备	handle	vt.控制
dull	a.单调的，呆滞的	interpret	vt.解释
network	n.网络	feedback	n.反馈
circuit	n.电路，一圈，巡回	instrument	n.工具
switch	n.开关，电闸	manufacture	vt.制造
level	n.水平，标准	CAD	计算机辅助设计
status	n.状态	engineer	n.工程师
binary	a.二进位的	draft	n.草稿
store	vt.储存，储藏	graphics	n.图形
process	n.程序，过程	video	n.影像
character	n.字符	robotic	a./n.机器人学，机器人的
sound	n.声音	automation	n.自动化
image	n.影像，图像	word processing	字处理
programme	n.程序，计划	text	n.文本

logic inference	逻辑推理	communication	n.通讯
aid	vt.帮助，援助	electronic-mail	电子邮件
instruction	n.指令	teleconferencing	电话会议
convert	vt.转变	telecommunicating	远程通讯
originality	n.创造力	database	n.数据库
operate	vt.操作，运转	CAI	计算机辅助教学
ENIAC	电子数值积分计算机	transistor	n.晶体管
vacuum	真空	DOS	磁盘操作系统
resistor	n.电阻器	RAM	随机存取存储器
capacitor	n.电容器	mouse	n.鼠标
interference	n.干预	intensity	n.强烈，紧张
technology	n.技术	floppy	a.松软的
internal	a.内部的	fix	a.牢固的
symbolic	n.代号	write-protect	写保护
language	n.语言	drive	n.驱动器
span	vt.跨越	mechanics	n.机械学
reliable	a.可靠的	access	vt.访问
efficient	a.有效率的	byte	n.比特
magnetic	a.有磁性的	mega	n.兆
auxiliary	a./n.附加的，辅助物	decimal	n.十进制
media	n.媒体	octal	n.八进制
storage	n.存储器	hexadecimal	n.十六进制
punched card tape	n.磁带	weight	n.权
memory	n.记忆，存储	code	n.代码
silicon	n.硅，硅元素	ASCII	美国信息交换标准代码
chip	n.芯片	extended	a.扩充的，长期的
terminal	n.终端机，终点，总站	voltage	n.伏特，
device	n.设备	integer	n.整数
innovation	n.改革，创新	negative	a.负的
external	a.外部的	absence	a.缺席
feature	n.特征	convenience	n.便利
component	n.元件，组件	waveform	n.波形
combination	n.联合，合并	zone	n.区
microprocessor	n.微处理器	vendor	n.厂商，自动售货机
packed	a.包装的	implement	n.工具，器具
package	n.包裹，套装软件	quantity	n.数量
digital	a.数字的	rigid	n.硬的
analog	a.模拟的	fragile	a.易脆的
hybrid	a.混合的	susceptible	a.易受影响的

discrete	a.离散的	medium	n.媒体
vital	a.重要的，关键的	shutter	n.快门
monitor	n.显示器	general-purpose	通用
overwhelm	vt.制服	theory proving	定理证明
application	n.应用	information retrieval	信息检索
wire	n.电线，电报	personal computer	个人计算机
model	n.模型	time-consuming	a.费时的
versatility	n.多种变化，变通	routine task	日常工作
lump	vt.使成块	logical decision	逻辑判断
hardware	n.硬件	programmable	a.可编程的
stream	n.流	rewire	vt.重新接线,换铁线
resource	n.资源	generation	n.代
desktop	n.桌面	unreliable	a.不可靠的
cabinet	n.文件柜	auxiliary storage	辅助存储器
supercomputer	n.超级计算机	minicomputer	n.小型计算机
I/O device	输入／输出设备	system unit	系统部件
cell	n.单元	floppy disk	软盘
consecutively	a.连续的，连贯的	fix disk	硬盘
CPU	中央处理器	transmission	n.传送，传输

§1.1 General Knowledge

1.1.1 Introduction

A computer is a tool for manipulating and storing information. There are many different kinds of computers, ranging in size from hand-held calculators to large and complex computing systems filling several rooms or entire buildings. In the recent past, computers were so expensive that they could be used only for business or scientific computations; now there are personal computers available for use in the home.

1.1.2 What Is a Computer

What is a computer? Generally speaking, a computer is an electronic and machinery equipment which

§1.1 计算机常识

1.1.1 导 言

计算机是一种加工和存储信息的工具。计算机依据其体积大小，可以分成许多种类，有小至便携式的计算机，也有大到需占用数间房屋乃至整个建筑物的大型的复杂计算机系统。不久以前，计算机的价格还十分昂贵，用途被局限于商业计算和科学计算，而现在的个人计算机已经可以在家中使用了。

1.1.2 什么是计算机

什么是计算机呢？总的说来，计算机是一种用途非常广泛，能够

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has many uses, such as accepting, manipulating, storing, and representing information. It can replace people in dull, time-consuming, routine tasks.

Inside the computer, there is a complicated network of electronic circuits that control switches or levels. They both have two possible states: for the switches are on or off and the levels are high or low. That is the reason why binary is widely used to represent information in computer.

Computers can store and process not only letters, numbers and characters but also sounds, image, and information of other forms. Though they can not make suggestions for people, they can do calculating, communicating, word processing, information collecting and some other management. Under the control of the program, computers even can do some great things, such as logic inference, aiding decision, aiding design, theory proving, etc..

The reason why computers can work in a rather high speed is very simple: t is an electronic machine. For example, as soon as you turn on the switch, the light gets light at the same time. How fast the speed of the current is! Computers do all they can do instantaneously.

Computers are powerful. They can solve problems for people by carrying out instructions given to them. A sequence of instructions describing how to perform a certain task is called program. Before the programs in a computer can be executed, they must be converted into a limited set of simple instructions, and then the electronic circuits of each computer can recognize and directly execute them.

Computers have circuits which can make decisions. Therefore, they can solve a series of problems and make hundreds, even thousands, of logical decisions without becoming tired or bored, but they have no originality.

There are times when a computer seems to operate like a mechanical "brain", but its achievements

接收、加工、储存和传递信息的电器设备。它能够代替人们从事那些单调的，费时的日常工作。

计算机内部具有复杂的电路网络，它可控制开关或电平，这两者都有两种状态：开关的通、断，电平的高、低。这就是在计算机中广泛使用二进制来表示信息的原因。

计算机不仅能够存储并处理字母、数字和字符信息，也能存储并处理诸如声音、图像等其它形式的信息。尽管计算机不会替人们出主意，但它能够进行计算机，通讯，文字处理，信息收集和其它的一些管理。在程序的控制下，计算机还能胜任诸如逻辑推理、辅助决策、辅助设计、定理证明等工作。

计算机能极为高速工作的原因很简单，因为它是一台电子装置。拿开电灯举个例，当你合上开关，几乎同时电灯就亮了。电流速度太快了！计算机在瞬间完成它们所能做的事情。

计算机是极有能力的。它们能通过执行所给的指令为人们解决问题。一系列描述怎样执行某个任务的指令叫程序。在（某台）计算机中的程序被执行之前，它们必须被转换成一系列简单的指令，然后计算机中的电子线路就能识别并直接执行它们。

计算机具有进行逻辑判断的电路。所以，它能解决一系列问题，做出成百甚至上千个逻辑判断而不感到厌烦，但它们没有创造力。

计算机有时会象机械脑一样工作，但它的能力却受到人类大脑的

are limited by the minds of human beings. It is a useful tool for people.

1.1.3 History of Computers

The first general-purpose electronic computer to operate successfully was the Electronic Numerical Integrator and Computer (ENIAC). Its construction was proposed in 1942 by John Mauchly and J. Presper Eckert of the Moore School of Engineering, University of Pennsylvania. Work started on its development in June 1943 and the computer was completed by late 1945. It occupied 1500 ft^2 ($140m^2$) of floor space, weighed over 30 tons, consisted of approximately 18000 vacuum tubes, 70000 resistors, 10000 capacitors and 6000 switches and consumed 150 kW of power. It was used to generate ballistic tables and weather forecasts. In principle it was programmable but this could only be done with considerable difficulty by rewiring parts of the machine.

With the development of the ENIAC, the computer became a useful scientific and business tool. The ENIAC could operate without human intervention, depending only upon stored instructions. This development marked the beginning of the modern computer era. Since then, many refinements in computer's speed, size, and cost have been made. Many advancements in computer technology are divided into four time periods called generations.

1. First Generation of Computers

The first generation of computers lasted from 1951 to 1958. They were large, costly to buy, expensive to power, and often unreliable. Their internal operations were controlled through the use of vacuum tubes. These tubes were fairly large, and they generated so much heat that special air-conditioning had to be installed to handle it.

It was during this period that symbolic languages were developed. Symbolic languages use symbols

限制。所以，计算机是人类有用的工具。

1.1.3 计算机的历史

第一台成功运行的通用电子计算机是ENIAC （电子数值积分计算机）。它的结构是宾夕法尼亚大学牧尔工程学院的约翰.莫奇莱（John Mauchly）与埃克特（J. Presper Eckert）于1942年提出的。该工程于1943年6月开始研制。它占地1500平方英尺（$140M^2$），重量超过30吨。它由约18000只真空管，70000只电阻，10000只电容及6000只开关组成，耗电150KW。被用于编制弹道表及天气预报。从原理上说，它是可编程的，但是，要做到这一点相当困难，因为要对机器的部件重新接线。

随着ENIAC的开发，计算机成为有用的科学和商业工具。ENIAC能够不需要人的干预而只依靠存储的指令进行操作。这个发展标志着现代化计算机时代的开端。从那以后，进行了许多对计算机在速度、大小、价格等方面的改进，被分为四个阶段，称为“代”。

1. 第一代计算机

第一代计算机从1951年持续至1958年。它们体积大，价格昂贵，启动费力且常常不可靠。它们的内部操作是通过真空管来控制的。这些真空管很大，并且它们聚集了如此多的热量以至于不得不靠安装专门的空调来进行处理。

正是是这个时期，符号语言得到了开发。符号语言是用字母和数

made up of letters and numbers to stand for 0s and 1s of machine language. For example, ADD may stand for addition. Computer instructions written in symbolic languages were easier for people to use than machine language but symbolic language had to be translated into machine code before the computer could follow the instructions. The machine codes were stored on the outer surface of magnetic drum.

2. Second Generation of Computers

The second generation of computers spanned the years from 1959 to 1964. It was during this time that the technology race really began.

The most notable change was that transistors replaced vacuum tubes. As a result, computers became much smaller, faster, and more reliable. They also became more efficient. Also at this time, magnetic cores replaced magnetic drums as storage media.

Next, the second generation of computers were given auxiliary storage, sometimes called external or secondary storage. Data was stored outside the computer on either magnetic tapes or magnetic disks. The use of auxiliary storage ended the limitation on how much data the computer could store and reduce the use of punched cards. Using magnetic tapes for input and output operations increased the speed of computer.

Finally, improvements were made in the symbolic programming languages. New languages were more like English than the earlier ones, making programming the computer much easier.

3. Third Generation of Computers

The third generation of computers lasted from 1965 to 1970. During the time, technology continued to improve and computers became even smaller, while their memory capacities became larger.

The third generation is marked chiefly by the development of integrated circuits, which replaced transistors. With integrated circuits, hundreds of electronic components could be included on one silicon

字组成的符号来代表机器语言的0和1。例如，ADD代表加法，用符号语言写的计算机指令比用机器语言写的指令对人来说要好用一些。但在计算机能执行这些指令之前，符号语言必须被翻译成机器代码，机器代码被存储在磁鼓的外表面。

2. 第二代计算机

第二代计算机跨越了1959年，直到1964年。正是在这段时间里，技术竞争真正开始了。

最显著的变化是晶体管代替了真空管，它导致计算机的体积变得更小，更快，更可靠。同时也变得更高效了。也就是在这个时期，磁芯代替了磁鼓作为存储媒介。

其次，第二代计算机有了辅助存储器（有时也称为外存或二级存储器）。数据被存储在计算机外部的磁带或磁盘上。辅助存储器的使用结束了计算机主存容量对程序和数据的规模的限制，减少了穿孔纸带的使用，采用磁带来进行输入与输出，提高了计算机的速度。

最后，在符号程序设计语言上也得到了改善。新的语言比以前更加接近英语，从而，为计算机设计程序变得更加容易了。

3. 第三代计算机

第三代计算机从1965年持续至1970年。在此期间，技术继续得到了提高，同时计算机的体积变得更小，而其存储能力却更大了。

第三代计算机的主要标志是集成电路的发展，集成电路代替了晶体管。有了集成电路，成百上千的电子元件可以被集成到一块不到1/8

chip less than one-eighth-inch square.

A number of other developments characterized this period. For example, minicomputers were introduced. These machines had many of the same capabilities as large computers; but they were much smaller, had less storage space, and cost less. Another development was the use of remote terminals, input/output devices that are electronically linked to the main computer but located at some distance from it. A popular innovation was the introduction of families of computers that could support as many as forty different external devices, such as printer and remote terminals. Each computer in the family contained a different main storage capacity. A company could easily move up a machine with more storage while continuing to use the same external devices.

4. Fourth Generation of Computers

The period for the fourth generation of computers is given as 1971 to the present. Chip circuit has become increasingly miniaturized in the fourth generation of computers. Large-scale Integration (LSI) circuit, featuring thousands of electronic components on a single silicon chip became common during the 1970s. From LSI technology came the microcomputer, the small "computer on a chip". Microprocessor chips can manage the functions of the computer, perform calculations, and control other devices just as large computers can. The combination of the microprocessor and other densely packed chips used for storage and input/output operations forms a microcomputer. Modern microcomputers have more power than the large computers of earlier generations. LSI has already progressed into VLSI (Very Large Scale Integration), which means even more capabilities in even smaller packages.

1.1.4 Classification of Computers

1. Digital, Analog, and Hybrid Computers

平方英寸的硅片上。

另一些发展也成为这个时期的特色，例如产生了小型计算机。这些机器有许多大型机相同的能力。但它体积更小，存储容量更大而且更便宜。另一个发展是使用远程终端，即是一个远离主机但通过电子线路与主机联系在一起的输入输出设备。一个很受欢迎的改进是产生了能够支持多达40多个不同外部设备（这些设备的例子是打印机和远程终端等）的计算机系列。系列中的每一种计算机都有不同的主存容量。计算机公司能够在使用原有的外部设备的情况下，通过增加存储容量轻易地将计算机升级。

4. 第四代计算机

第四代计算机所处的阶段是1971年至今。第四代计算机的芯片电路已日益缩小化。70年代，以在单个硅片上集成成千上万个电子元件为特色的大规模集成电路已变得很普及了。由于大规模集成技术而产生了微处理机，即“在一块芯片上的小型计算机”。微处理机芯片能管理计算机的功能，执行运算，控制其它设备，象大型机那样。微处理机和其它的用于存储和输入输出操作的紧密结合在一起的部件组合而产生了微机。现代的微机比早期的微机具有更强的能力。大规模集成电路已发展成为超大规模集成电路，这意味着更小的组件具有更大的能力。

1.1.4 计算机的分类

1. 数字、模拟和混合计算机

A digital computer is a counting device that operates on discrete data. It operates by directly counting numbers (or digits) that represent numbers, letters, or other special symbols. Just as digital watches directly count off the seconds and minutes in an hour, digital processors also count discrete values to achieve the desired output results.

In contrast to digital processors, however, there are also analog computers that do not compute directly with numbers. Rather, they deal with variables that are measured along a continuous scale and are recorded to some predetermined degree of accuracy. Temperature, for example, may be measured to the nearest tenth of a degree on the Celsius scale, voltage may be measured to the nearest hundredth of a volt, and pressure may be measured to the nearest "pound per square inch" value. Analog computing systems are frequently used to control processes such as those found in an oil refinery where flow temperature measurements are important.

Desirable features of analog and digital machines are sometimes combined to create a hybrid computing system. In a hospital intensive-care unit, for example, analog devices may measure a patient's heart function, temperature, and other vital signs. These measurements may then be converted into numbers and supplied to a digital component in the system. This component is used to monitor the patient's vital signs and to send an immediate signal to the nurse's station if any abnormal readings are detected.

Analog and hybrid processors obviously perform important specialized tasks. But the overwhelming majority of all computers used for business and scientific applications are digital devices.

2. General-Purpose and Special-Purpose Digital Computers

Digital computers are made for both special and general uses. As the name suggests, a special-purpose

数字计算机是对离散数据进行操作的计算设备。它直接对表示数字、字母或其它专用符号的数进行计算。正如数字表以秒、分来计算小时那样，数字处理器也对离散数值进行计算以获得所需要的输出结果。

还存在一种与数字计算机相反的模拟计算机，它不直接对数进行计算。模拟计算机处理在连续标度上测量的变量并按预先规定的精度进行记录。例如：测量时，温度可精确到1/10摄氏度，电压可精确到1/100伏，压力可精确到"磅/平方英寸"。模拟计算机系统常用于控制诸如炼油厂中的流量和温度测量过程。

有时把模拟计算机和数字计算机的优点结合起来形成一个混合计算机系统。例如在医院使用的监护器中，模拟部件可用于测量病号的心功能、温度和其它生理症状。然后把这些测量信号转换成数字并送给系统的数字部件，该部件用于监视病员的生理症状，当检测到异常信号时，向护士值班室发出报警信号。

很明显，模拟和混合处理器用于完成重要的特定任务。但绝大多数商业和科学的计算机是数字计算机。

2. 通用和专用数字计算机

数字计算机可分为专用的和通用的。正如它们的名字所表示的，

computer is one that's designed to perform only one specific task. The program of instructions is wired into or permanently stored in such a machine. Although it lacks versatility, it does its single task quickly and efficiently.

Special purpose processors designed just to solve complex navigational problems are installed aboard U. S. atomic submarines. Not too long ago, however, special-purpose computers were too expensive for most applications. Only a few might be needed by one organization, and the specialized model might not do anyone else any good. But today, customized microcomputers are produced in large quantities to perform tasks such as monitoring household appliance and controlling the fuel, ignition, and instrument systems in automobiles. Furthermore, rapid progress is now being made in developing the automated design tools that engineers can use to economically build small quantities of complex microcomputer chips for specialized purposes.

A general-purpose computer is one that can store different programs and can thus be used in countless applications. You have seen that by using different instructions such a machine can process a payroll one minute and a billing application the next. New programs can be written, and old programs can be changed o dropped. The versatility of general-purpose system is limited only by human imagination. And so, unless otherwise noted, all our future discussion of "computer" will be about general purpose digital systems.

3. Micro, Mini, Mainframe and Super Computers

All computer system of interest to us are similar in that they contain hardware components for input, central processing, and output. They all perform basic machine operations under the direction of stored programs which can be quickly changed to permit the processing of a stream of different applications. Of

专用计算机是完成某一专门任务的计算机，其指令程序是固化或永久存储在该机器上的，虽然它缺乏通用性，但它执行单一任务时很快，效率很高。

为了解决复杂的导航问题，美国将几个专用处理器装在了核潜艇上。但是，专用计算机对大多数用户来讲仍然很昂贵。一个部门对专用计算机需求很少，而专用方式不能很好完成其它任务。现在，客户定制的微型计算机已大量生产，它们用于完成诸如监视家庭设施、控制燃料、点火以及汽车中的仪表系统。目前自动设计工具得到了快速发展，工程师可用这些工具为个别用户设计复杂的专用微型计算机芯片。

通用计算机是一种可存储不同程序的，应用无可估量的计算机。你已看到了，一台机器使用不同的命令，可在这一分种内计算机工资单，在下一分种开出帐单。可以写出新程序而更改或去掉旧程序。通用计算机的通用性只是受人们创造力的限制。因此，除非特别说明，以后所讨论的计算机都是指通用数字系统。

3. 微型、小型、大型计算机和超级计算机

所有目前使用的计算机，它们的输入设备、中央处理器和输出设备的硬件都是相似的。所有这些机器都是在存储程序的指导下完成基本的机器操作，而存储程序可很快地改变以处理其它不同的任务。当

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