



计算机专业 英语教程

金志权 张幸儿 编著



电子工业出版社

PUBLISHING HOUSE OF ELECTRONICS INDUSTRY

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北京·BEIJING

内 容 简 介

英语是了解国外当前发展动向和进行国际学术交流的重要工具。本书旨在使读者掌握计算机专业英语术语;通过语法分析,培养和提高读者阅读专业英语文献资料的能力,包括笔译的能力;同时也了解计算机科学的一些基本知识和当前最新发展。

本书素材取自国外90年代计算机科学各个领域的最新教材、专著、论文和计算机网络信息,内容涉及计算机科学各个领域的当前状况和最新发展。本书特点是:内容新颖、覆盖面广、系统性强、可读性好,是学习计算机英语的理想读物。

本书可供大专院校计算机专业师生使用,也可作为计算机专业人员及其他有兴趣人员的学习参考读物。

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前 言

目前,计算机科学发展迅猛,新名词、新术语层出不穷。为了适应计算机专业英语的教学需要、广大计算机专业人员阅读计算机专业英文文献资料的需要以及不断增长的计算机用户(包括上网用户)对计算机专业英语的学习需要,我们编写了本教材。

本书旨在使读者掌握计算机英语术语,通过语法分析,培养和提高读者阅读计算机英语文献资料的能力,包括笔译的能力;通过阅读本书也了解计算机科学各个领域的基本概念和当前最新发展。本教材是在教学实践基础上,参考了大量的国内外最新教材、专著、论文、报纸以及Internet上的信息后编写而成的。所选内容大致分以下几类:1.读者已熟悉的计算机基础知识;2.侧重于笔译的短文;3.介绍新概念、新技术、新内容的材料;4.报道类或评论类文章等。

全书对课文中的计算机术语和不常见英语词汇给出了基本含义的中文解释,对课文中典型的和较难分析与翻译的句子作了注释与翻译,并给出了部分课文的参考译文。为了使有兴趣的读者了解领域中更广泛的知识,本书最后附有所选用的参考文献目录。

本书的特点是内容新颖、覆盖面广、系统性强、可读性好。

全书共分12章。每一章的第一篇通常都是读者熟悉的内容。对于英语水平较好的读者,可以泛读或跳过该节,而对初学者,建议每章精读这一篇。教师可根据各篇中最后一个注释给出的该篇简短说明或各篇标题,在每一章中挑选若干篇课文进行教学。作为练习,可选择若干章节让学生进行笔译,并进行课堂讨论。

本书的第1、3、4、6、8、12章由金志权编写,第2、5、7、9、10、11章由张幸儿编写,彼此进行了审阅。

作者十分感谢邓露林编辑,没有他的组织和督促,就不会有本教材。此外,他对教材的选材和深度提出了宝贵意见。也感谢赵丽松小姐的帮助。作者还要感谢南京大学陈佩佩、顾本喜、彭云楼、陆锺楠等老师,南京师范大学顾铁成老师,南京航空航天大学楼佩煌老师的帮助,感谢陶永祥、张万华在我们收集资料方面提供的帮助,感谢陈元喜等同学阅读部分章节后提出的有益建议。特别感谢南京大学外国语学院的王守仁、杨治中、侯焕谬、张子清老师的帮助。

限于作者水平,书中一定会有不妥和错误之处,敬请读者批评指正。联系地址:南京市南京大学计算机系210093。E-mail地址:jinzq @ public1.ptt.js.cn 或 zhangxr@nju.edu.cn.

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Chapter 1 Hardware

1.1 A Closer Look at the Processor and Primary Storage

We have learned that all computers have similar capabilities and perform essentially the same functions, although some might be faster than others. We have also learned that a computer system has input, output, storage, and processing components; that the processor is the “intelligence” of a computer system; and that a single computer system may have several processors. We have discussed how data are represented inside a computer system in electronic states called bits. We are now ready to expose the inner workings of the nucleus of the computer system—the processor.

The internal operation of a computer is interesting, but there really is no mystery to it. The mystery is in the minds of those who listen to hearsay and believe science-fiction writer. The computer is a nonthinking electronic device that has to be plugged into an electrical power source, just like a toaster or a lamp.

Literally hundreds of different types of computers are marketed by scores of manufacturers^[1]. The complexity of each type may vary considerably, but in the end each processor, sometimes called the **central processing unit or CPU**, has only two fundamental sections: the control unit and the arithmetic and logic unit. Primary storage also plays an integral part in the internal operation of a processor. These three—primary storage, the control unit, and the arithmetic and logic unit—work together. Let's look at their functions and the relationships between them.

Unlike magnetic secondary storage devices, such as tape and disk, primary storage has no moving parts. With no mechanical movement, data can be accessed from primary storage at electronic speeds, or close to the speed of light. Most of today's computers use CMOS (Complementary Metal-Oxide Semiconductor) technology for primary storage. A state-of-the-art CMOS memory chip about one eighth the size of a postage stamp^[2] can store about 4,000,000 bits, or over 400,000 characters of data!

Primary storage, or main memory, provides the processor with temporary storage for programs and data. All programs and data must be transferred to primary storage from an input device (such as a VDT) or from secondary storage (such as a disk) before programs can be executed or data can be processed. Primary storage space is always at a premium; therefore, after a program has been executed, the storage space it occupied is reallocated to another program awaiting execution.

Figure 1-1 illustrates how all input/output (I/O) is “read to” or “written from” primary storage. In the figure, an inquiry (input) is made on a VDT. The inquiry, in the form of a

message, is routed to primary storage over a channel (such as a coaxial cable). The message is interpreted, and the processor initiates action to retrieve the appropriate program and data from secondary storage^[3]. The program and data are “loaded”, or moved, to primary storage from secondary storage. This is a nondestructive read process. That is, the program and data that are read reside in both primary storage (temporarily) and secondary storage (permanently). The data are manipulated according to program instructions, and a report is written from primary storage to a printer.

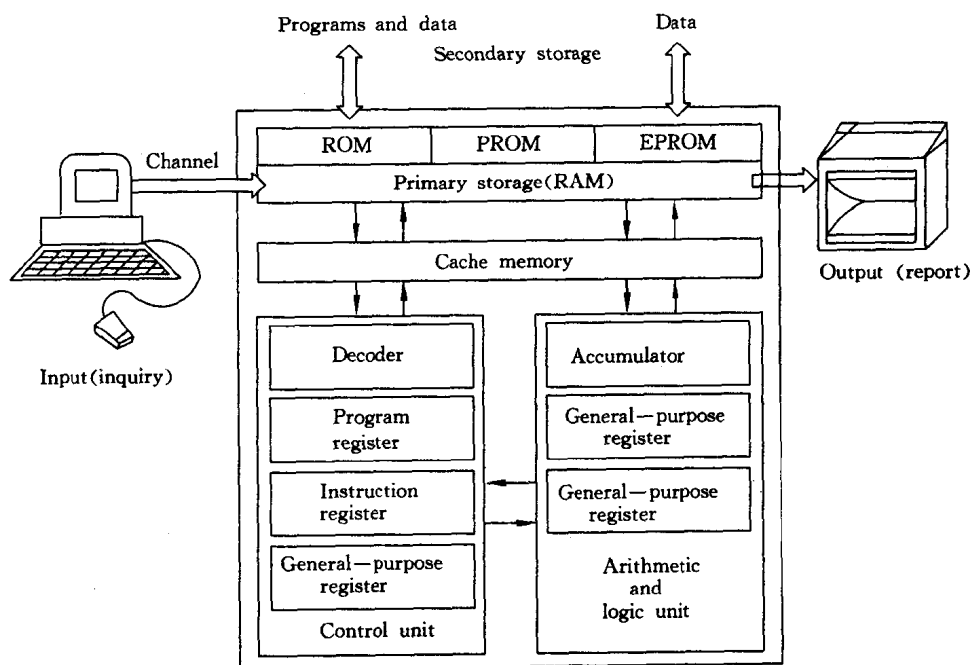


Figure 1-1

Interaction Between Primary Storage and Computer System Components

All programs and data must be transferred from an input device or from secondary storage before programs can be executed and data can be processed. During processing, instructions and data are passed between the various types of internal memories, the control unit, and the arithmetic and logic unit. Output is transferred to the printer from primary storage.

A program instruction or a piece of data is stored in a specific primary storage location called an **address**. Addresses permit program instructions and data to be located, accessed, and processed. The content of each address is constantly changing as different programs are executed and new data are processed.

Another name for primary storage is random-access memory, or RAM. A special type of primary storage, called **read-only memory (ROM)**, cannot be altered by the programmer. The contents of ROM are “hard-wired” (designed into the logic of the memory chip) by the manufacturer and can be “read only.” When you turn on a microcomputer system, a program in ROM automatically readies the computer system for use. Then the ROM program produces the initial display screen prompt.

A variation of ROM is **programmable read-only memory (PROM)**. PROM is ROM into which you, the user, can load “read-only” programs and data. Once a program is loaded to PROM, it is seldom, if ever, changed. However, if you need to be able to revise the contents of PROM, there is **EPROM**, erasable PROM.

Cache Memory

Program and data are loaded to RAM from secondary storage because the time required to access a program instruction or piece of data from RAM is significantly less than from secondary storage. Thousands of instructions or pieces of data can be accessed from RAM in the time it would take to access a single piece of data from disk storage^[4]. RAM is essentially a high-speed holding area for data and programs. In fact, nothing really happens in a computer system until the program instructions and data are moved to the processor. This transfer of instructions and data to the processor can be time-consuming, even at microsecond speeds. To facilitate an even faster transfer of instructions and data to the processor, most computers are designed with **cache memory**. Cache memory is employed by computer designers to increase the computer system **throughput** (the rate at which work is performed).

Like RAM, cache is a high-speed holding area for program instructions and data. However, cache memory uses a technology that is about 10 times faster than RAM and about 100 times more expensive. With only a fraction of the capacity of RAM, cache memory holds only those instructions and data that are likely to be needed next by the processor.

Words

processor	处理机	primary storage	主存储器
bit	位, 二进制位	hearsay	传闻, 谣传
scores of	许多	CPU	中央处理机
control unit	控制部件	arithmetic and logic unit	算术逻辑部件
integral parts	不可缺的部分, 组成部分	tape and disk	磁带和磁盘
CMOS	互补金属氧化物半导体	a state of the art	目前工艺水平
chip	芯片	(the state of the art)	最新发展水平
VDT (Video Display Terminal)	视频显示终端	secondary storage	辅助存储器, 二级存储器
at a premium	非常珍贵	reallocate	重新分配
capacity	容量	coaxial cable	同轴电缆
program and data	程序和数据	instruction	指令
location	单元, 位置	RAM	随机存取存储器
ROM	只读存储器	hard-wired	固化, 硬件实现的
EPROM	可擦可编程只读存储器	cache	高速缓存
throughput	吞吐量		

Notes

1. 这里 are marketed 意为“被销售”, literally 译为“不加夸张地讲, 确实地”。全句可译为: 不加夸张地讲, 市场上有几百种不同类型的计算机在销售。
2. about one eighth the size of a postage stamp 是介词短语, 修饰前面的 CMOS memory chip, 即约 1/8 邮票大小(的)。
3. retrieve the appropriate... 意为“取出所需的...”, initiate 译为“启动, 初始化”。本句译为: 消息被解释, 处理机从辅助存储器取出所需的程序和数据。
本句的上一句中 route 译为“发送, 路由”。全句译为:
查询以消息的形式通过通道(像同轴电缆)发送到主存储器。
4. it would take to access... 是定语从句, 修饰前面的 the time, 其前面省略了关系代词 that。it 是引导词, 作形式主语, 真实主语是动词不定式 to access...。access 译为“访问, 存取”。全句译为:
从磁盘存储器上存取单个数据所花的时间, 可以从 RAM 中存取几千条指令或数据。

1.2 Will Network Computers Unseat PCs?

To make the picture clearer, the NetPC platform requires at least a 100 MHz or faster Pentium processor; 16 MB of memory; an internal hard disk for caching; support for Ethernet, CD-ROM or hardware expansion slots, Token Ring, ATM or ISDN; connections for keyboard, display and pointing device; a modem; and plug-and-play technology.

Like the proponents of the NC, the NetPC advocates also claim that this new platform reduces the cost of owning traditional PCs, allowing for remote system configuration, remote software installation and upgrading, off-hours maintenance, etc. They also preach that you can use any NetPC machine and still have access to your customisable environments. However, as far as the price point is concerned, NC boxes touted by Oracle and Sun costs about US \$ 700 to US \$ 800, compared to NetPC prices that roughly range from US \$ 1,000 to US \$ 1,500 depending on configuration.

Like NCs, the NetPCs are appropriate for mid- to large-size companies that require centralized PC management and where there is no need for end-user system modification. These users may be involved in task-focused environments or where computers are shared devices^[1]. Examples of functions performed in these environments include customer support, finance, manufacturing education, and training.

Going back to the concern about NCs or NetPCs curbing your total control and freedom over the use of your PC, like in real life, there are indeed limitations to freedom^[2]. If you work in a company that will finally decide to replace PCs with NCs or NetworkPCs, you have got to live with it.

There are certain situations, where it seems to make sense to have a centrally-controlled computing environment. Boeing, a big company in the US, for instance, reportedly ordered 1,000 units of NCs and so did American Eagle (a subsidiary of American Airlines), which reportedly

placed order for 3,000 units of NCs.

However, if the idea of working in a controlled environment doesn't warm your heart, and you'd rather work in an environment where control of your desktop is not totally up to someone that sits on the server side, free yourself, get out of that "oppressive" environment and work somewhere else.

Both advocates of the two platforms for network computing are powerful and it is too early to see^[3] which direction the battle for the soul of network computing will be. We suppose it all depends on how adroitly each side plays, and how customers—— especially corporate customers decide what's important to them.

From our perspective, the NC doesn't make the PC obsolete. Rather, it is an additional option from which the corporate world will choose, depending on which network computing platform works best for them—— the NC or the NetPC; or whether they'll choose to stay with desktop PCs.

For one thing, the appearance of NCs is a healthy shot in the arm that brings another liberation; Liberation from the total control and monopoly—— by a few industry giants—— of the total computing market. That, we think is success enough.

Words

unseat	使退位, 剥夺... 的席位	Ethernet	以太网
CD-ROM	光驱	slot	槽, 插槽, 槽口
Token Ring	令牌环网	ATM	异步传输模式(见 4.4)
ISDN	综合业务数字网(见 4.2)	pointing device	定点设备
modem	调制解调器	plug-and-play	即插即用
NC	网络计算机	NetPC	网络 PC 机
(Network Computer)		(Network PC)	
advocate	拥护(者), 提倡(者)	configuration	配置, 结构
upgrade	升级, 提高	off-hours	非工作时间, 业余时间
preach	鼓吹	customisable	可定制的
tout	兜售, 吹捧, 推崇	curb	控制, 抑制, 约束
a shot in the arm	兴奋剂, 刺激因素		

Terms

NC(Network Computer) *noun*

A computer having the hardware and software necessary for it to be connected to a network.

Notes

1. task-focused 意思是“任务为中心”, where computers are shared devices 地点状态从句, 与前面的 environment 并列。全句可译成:
这些用户可能处于以任务为中心的环境中, 或处于计算机是共享设备的环境中。

2. going back to...是状语从句,其中 curbing...是分词短语,修饰 NC or NetPC。全句译为:下面回过来看看有关 NC 或 NetPC 对你在使用 PC 时所具有的完全控制和自由的抑制问题,像在实际生活中一样,这确实对自由存在各种限制。
3. it is too early to see 直译是“太早以致于不能看到”,但不如译为“现在还看不出”。同样下一句中 how adroitly each side play 按字面译为“每一方如何机灵地干”,不如翻成“每一方如何出色地工作”。adroitly 原为“灵巧地,机灵地”。
4. 本节是一篇对网络计算机的评述性短文,目的是用来讨论笔译技巧。。

1.3 Optical Storage Media: High-Density Storage

1.3.1 Optical Laser Disks

Optical laser disk technology eventually may make magnetic-disk and magnetic-tape storage obsolete. With this technology, the read/write head used in magnetic storage is replaced by two lasers. One laser beam writes to the recording surface by scoring microscopic pits in the disk, and another laser reads the data from the light-sensitive recording surface^[1]. A light beam is easily deflected to the desired place on the optical disk, so an access arm is not needed.

Optical laser disks are becoming a very inviting option for users. They are less sensitive to environmental fluctuations, and they provide more direct-access storage at a cost that is much less per megabyte of storage than the magnetic-disk alternative^[2]. Optical laser disk technology is still emerging and has yet to stabilize; however, at present there are three main categories of optical laser disks. They are CD-ROM, WORM disk, and magneto-optical disk.

CD-ROM

Introduced in 1980, the extraordinarily successful CD, or compact disk, is an optical laser disk designed to enhance the recorded reproduction of music^[3]. To make a CD recording, the analog sounds of music are translated into their digital equivalents and stored on a 4.72-inch optical laser disk. Seventy-four minutes of music can be recorded on each disk in digital format by 2 billion digital bits. With its tremendous storage capacity, computer-industry entrepreneurs immediately recognized the potential of optical laser disk technology. In effect, anything that can be digitized can be stored on optical laser disk; data, text, voice, still pictures, music, graphics, and video.

CD-ROM (pronounced cee-dee-ROM) is a spinoff of audio CD technology. CD-ROM stands for compact disk-read only memory. The name implies its application. CD-ROM disks, like long-playing record albums, are “pressed” at the factory and distributed with their prerecorded contents (for example, the complete works of Shakespeare or the first 30 minutes of *Gone With the Wind*)^[4]. Once inserted into the disk drive, the text, video images, and so on can be read into primary storage for processing or display; however, the data on the disk are fixed—they cannot be altered. This is in contrast, of course, to the read/write capability of magnetic disks.

The tremendous amount of low-cost direct-access storage made possible by optical laser disks has opened the door to many new applications.

WORM Disks

Write once, read many, or WORM, optical laser disks are used by end user companies to store their own, proprietary information. Once the data have been written to the medium, they only can be read, not updated or changed.

WORM disks are a feasible alternative to magnetic tape for archival storage.

Magneto-Optical Disk

Magneto-optical disk offers promise that optical laser disks will become commercially viable as a read-and-write storage technology^[5]. The $5\frac{1}{4}$ -inch disks can store up to 1000 Mb. At present, magneto-optical disks are too expensive and do not offer anywhere near the kind of reliability that users have come to expect of magnetic media^[6]. In addition, the access times are relatively slow, about the same as a low-end Winchester disk.

As optical laser disk technology matures to reliable, cost-effective, read/write operation, it eventually may dominate secondary storage in the future as magnetic disks and tape do today.

1. 3. 2 Digital Video Disc

DVD (Digital Video Disc) is the next generation of optical disc storage technology. With digital video disc technology video, audio, and computer data can be encoded onto a compact disc (CD). A digital video disc can store greater amounts of data than traditional CDs. A standard single-layered, single-sided digital video disc can store 4.7 GB of data; a two-layered standard enhances the single-sided layer to 8.5GB. Digital video discs can be double-sided with a maximum storage of 17 GB per disc. A digital video disc player is needed to read digital video discs. This player is equipped to read older optical storage technologies. Advocates of digital video disc technology intend to replace current digital storage formats, such as laser disc, CD-ROM, and audio CDs, with the single digital format of digital video disc. Also called digital versatile disc.

DVD Forum Receives Top Information Technology Industry Award for Creation of Unified Specification for Next Digital Multimedia Era

The DVD Forum today announced that it has received the 1997 PC Magazine Award for Technical Excellence in the category of "Standards," in recognition of the Forum's successful development of the DVD-ROM specification^[7].

"New standards are particularly important, since they promise to bring higher levels of technology innovation and market compatibility to today's technology users," said Michael J. Miller, editor-in-chief of PC Magazine. "DVD-ROM is a compelling technology that was chosen because it's a familiar format that brings a wealth of new computing, educational, gaming and entertainment possibilities to the user."

In the Award citation to DVD-ROM technology, PC Magazine referred to DVD as the format that will "replace the CD-ROM as the primary means of PC content distribution^[8]." Representatives of three companies involved in development of the specification, Hitachi Ltd.,