高职高专“十一五”计算机类专业规划教材

计算机专业英语教程

桑莉君　主编

JISUANJI ZHUANYE YINGYU JIAOCHENG

赠电子课件

机械工业出版社
CHINA MACHINE PRESS

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主　编　桑莉君
副主编　宋晓涛　王咏梅
参　编　张　晓　赵　丽
　　栗亚荣　邓　静

机械工业出版社

本书是为高职高专计算机专业英语课程编写的教材。全书共分为10个单元，每个单元都包含课文、词汇、注释、练习、阅读材料和写作等几个部分。

本书具有简明、实用和可操作性强等特点，除可作为相关课程教材外，也可供从事计算机专业工作或以计算机为办公工具的相关人员学习参考。

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图书在版编目（CIP）数据

计算机专业英语教程/桑莉君主编. —北京：机械工业出版社，2008.5
高职高专“十一五”计算机类专业规划教材
ISBN 978-7-111-23931-4

Ⅰ. 计… Ⅱ. 桑… Ⅲ. 电子计算机—英语—高等学校：技术学校—教材 Ⅳ. H31

中国版本图书馆 CIP 数据核字（2008）第 051754 号

机械工业出版社（北京市百万庄大街 22 号 邮政编码 100037）
策划编辑：王玉鑫 责任编辑：刘子峰 版式设计：霍永明
封面设计：马精明 责任印制：洪汉军
北京瑞德印刷有限公司印刷（三河市明辉装订厂装订）
2008 年 5 月第 1 版第 1 次印刷
184mm×260mm · 10.25 印张 · 245 千字
0001—4000 册
标准书号：ISBN 978-7-111-23931-4
定价：18.00 元

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（按姓氏拼音排序，排名不分先后）

前　言

本书是“高职高专计算机类专业规划教材”之一，供高等学校计算机专业英语教学使用，也适合从事计算机专业工作或以计算机为办公工具的相关人员学习参考。

本书旨在切实提高学生的计算机专业英语阅读能力。书中内容立足于实用性，从历史、软件、硬件和网络等几个方面出发，同时兼顾技术发展热点和计算机文化原则，不仅有利于学生了解计算机领域的最新技术发展，而且让学生在轻松有趣的阅读中掌握并积累计算机专业英语词汇。

本教材具有以下几个特点：

1. 以章为教学单元，系统地讲述该领域中的常见技术。

2. 每个单元都包含课文、词汇、注释、练习、阅读材料和写作几个部分。

3. 课文和阅读材料选材广泛，融知识性、趣味性、实用性为一体，素材尽可能取自国外原版文献，内容涉及计算机技术的各个领域。

全书由太原理工大学轻纺美院桑莉君担任主编，参加本书编写工作的教师还有：太原理工大学轻纺美院的宋晓涛、张晓、栗亚荣、邓静，山西晋中学院的赵丽，湖南铁道职业技术学院王咏梅等教师。全书由桑莉君、宋晓涛统稿，山西太原师范学院的陈桂芳教授审阅了全部书稿，并提出了不少宝贵建议。

由于作者水平有限且编写时间仓促，错误和不足之处在所难免，敬请读者批评指正。

编　者

Contents

Unit 1 Overview Of Computer

Competencies

After you have read this unit, you should be able to:

1. Discuss computer and computer revolution.
2. Describe computer hardware and software.
3. Describe computer network and Internet.
4. Name several network applications.

Text

Overview of Computer

Evolution of Computer

The word "computer" has been part of the English language since 1646, but if you look in a dictionary printed before 1940, you might be surprised to find a computer defined as a person who performs calculations! Prior to 1940, machines designed to perform calculations were referred to as calculators and tabulators, not computers. Modern definition and use of the term "computer" emerged in the 1940s, when the first electronic computing devices were developed.

The "computer revolution" which started in the '50s is an ongoing change in the way we do things. It has already had two distinct phases and is just entering its third phase.

The first phase concentrated on calculations. Computers were originally conceived of as tools for performing large, repetitive sets of numerical calculations quickly and correctly. The programs developed during this phase simplified the work of engineers and scientists. The kinds of problems they solved involved 'number-crunching'. In some cases, number-crunching programs made it possible to do things that would have been impossible without the aid of computers. For example, putting a satellite into orbit from an (orbiting) space shuttle (see Figure1-1) requires extremely fast computations that rely on up-to-the-minute information about position, speed, etc. No human could process the information quickly enough to accomplish these tasks satisfactorily and no group of humans could coordinate their answers to sub-problems fast enough.

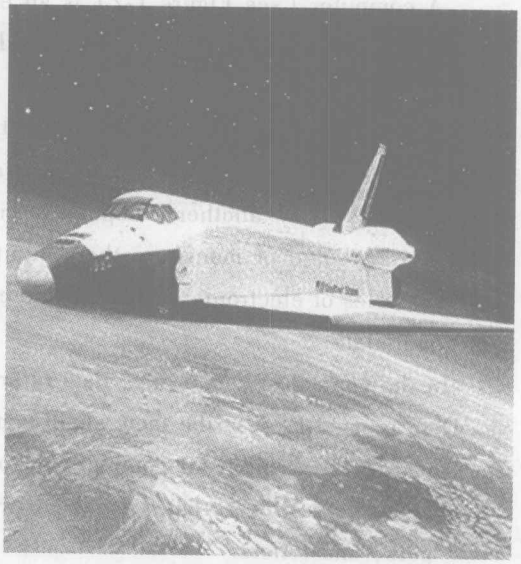

Figure1-1 Space Shuttle in Orbit

This sort of 'real-time' calculation is only possible with the aid of computers.

The second phase of the revolution used computers as 'information processors'. By the '60s, it had become obvious that computers could store and examine non-numerical data as well as get answers from numerical data. This led to automating the general process of record-keeping. This phase was most closely associated with organization. Programs were intended to simplify the work of librarians, administrators, and ordinary individuals. Many programs involved managing 'databases', large collections of information whose individual items had to be readily available. Other programs made it easy to prepare tables and reports; these automated the tasks of formatting and editing.

These first two phases both involved algorithmic activities. We can instruct the computer on precisely what to do under any set of conditions that arises. We know how to solve the problems correctly, and computers are useful because they can solve them faster and/or because they do some of the work for us.

The third phase, which we are just entering, involves solving problems that don't have well-defined solutions. These problems involve either a lot of interrelated factors that we can't disentangle or questions that we simply don't have the answers yet. As humans, we can frequently 'solve' them through 'hunches', 'educated guesses', or 'common sense' —by using information that we have but may not be able to explain. Medical diagnosis is one such problem, and parsing of ungrammatical sentences is another.

Computer and Internet Basics

Computers and the Internet are the cornerstones of a technology revolution that is dramatically transforming the way we live, work, play, and think. Whether you realize it or not, you already know a lot about computers. Here we provide an overview of computer, give you a basic understanding of how computers work and get you up to speed with a basic computer vocabulary.

A computer (see Figure 1-2) is an electronic device that accepts input, processes data, and produces output, all according to a series of stored instructions. Computer input is whatever being typed, submitted, or transmitted to a computer system. Input can be supplied by a person, by the environment, or by another computer. An input device, such as a keyboard or mouse, gathers input and transforms it into a series of electronic signals for the computer to store and manipulate.

Figure1-2 Microcomputer

In the context of computing, data refers to the symbols that represent facts, objects, and ideas. Data is used to describe facts about something. When stored electronically in files, data can be used directly as input for computers. Four common types of files are as follows:

- **Document files**, created by word processors to save documents such as memos, term papers, and letters.
- **Worksheet files**, created by electronic spreadsheets to analyze things like budgets and to

predict sales.

- **Database files**, typically created by database management programs to contain hilly structured and organized data.
- **Presentation files**, created by presentation graphics programs to save presentation materials. For example, a file might contain audience handouts, speaker notes and electronic slides.

Computers manipulate data in many ways, and this manipulation is called processing. The series of instructions that tell a computer how to carry out processing tasks is referred to as computer program, or simply a "program". These programs form the software that sets up a computer to do a specific task. There are two major kinds of software—system software and application software. The most important system software program is the operating system.

In a computer, most processing takes place in a component called the central processing unit (CPU), which is sometimes described as the computer's "brain". A computer stores data so that it will be available for processing. Most computers have more than one location for storing data, depending on how the data is being used. Memory, also known as primary storage, is an area of a computer that temporarily holds data waiting to be processed, stored, or output. Secondary storage is the area where data can be left on a permanent basis when it is not immediately needed for processing. Output is the result produced by a computer. An output device displays, prints, or transmits the results of processing. Computers produce output on output devices such as monitors and printers. In the subsequent units of this book, we will discuss hardware and software in detail.

When you think of computer, perhaps you just think of the equipment itself. But the way to think about a computer is as part of an information system. An information system has five parts: people, procedure, software, hardware and data.

Almost all of today's computer systems add an additional part to the information system. This part is connectivity, which allows computers to connect and to share information. Connectivity is the capability of your microcomputer to share information with other computers. Data and information can be sent over telephone lines or cables and through the air. Thus, your microcomputer can be connected to other computers. It can connect you to the Internet and other sources of information that lie well beyond your desk.

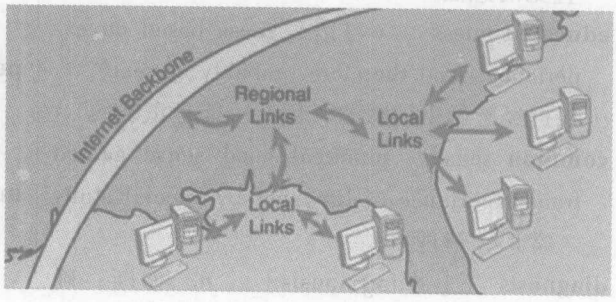

Figure1-3 Internet

Connectivity and the wireless revolution expand the use of computer several-fold. Central to the concept of connectivity is the computer network. The Internet is the largest network in the world (see Figure 1-3). It is a collection of local, regional, national, and international computer networks that are linked together. It has changed society dramatically. E-mail and instant messaging have caused a major shift in the way people communicate. Online stores have changed our shopping habits. The ability to easily down-

load music has stirred up controversy about intellectual property. The possibility of unauthorized access to online databases has made us more aware of our privacy and safety. The second half of the book will focus on network, the Internet and other related subjects.

Concept Check

✓ How many phases are divided during the computer development? Name characteristics of three phases described in the passage.

✓ List four common types of files.

✓ What is the Internet?

New Words and Phrases

cornerstone [ˈkɔːnəstəun] *n.* thing on which sth. is built; foundation 基础

e. g. Hard work was the cornerstone of his success. 努力奋斗是他成功的基础。

prior to *prep.* before 在……之前

refer to... as... 称……为……

tabulator [tæbjuleitə] *n.* thing that arrange (facts or figures) in a table or list 制表机

number-crunching *v.* 数字密集运算，即大量数值数据的运算

up-to-the-minute *adj.* having or including the most recent information 包含最新信息的

algorithmic [ˌælgəˈriðəmik] *adj.* 算法的

disentangle [ˈdisinˈtæŋgl] *v.* make (rope, hair, etc) straight and free of knots 将（绳子、毛发等）理直并解开其结子，理顺

hunch [hʌntʃ] *n.* an idea based on intuition or instinct and not on evidence 基于直觉的想法

educated guess （习语）guess based on experience (and therefore probably correct) 根据经验做出的猜测（因此可能是正确的）

common sense practical good sense gained from experience of life, not by special study 常识；情理

diagnosis [ˌdaiəgˈnəusis] *n.* 诊断；确定毛病；判断问题

parse [pɑːz] *v.* 对……作语法分析

ungrammatical [ˈʌngrəˈmætikəl] *adj.* contrary to the rules of grammar 不符合语法的；违反语法规则的

-fold *suff.* （后缀）……倍；several-fold 几倍

controversy [ˈkɔntrəvəːsi] *n.* public discussion or argument, often rather angry, about sth. which many people disagree with 公开辩论；论战

stir sth. up cause (trouble, etc) 惹起（麻烦等）

intellectual property 知识产权

privacy [ˈpraivəsi] *n.* state of being alone or undisturbed 独处或不受干扰的状态；隐私

context [ˈkɔntekst] *n.* circumstances in which sth. happens or in which sth. is to be considered 环境，背景

permanent [ˈpəːmənənt] *adj.* lasting or expected to last for a long time or for ever 永久的，永恒的；长久的，长期的

authorize [ˈɔːθəraiz] *v.* give authority to (sb.) 授权，委任，委托 unauthorized *adj.* 未授权

Notes

1. The programs developed during this phase simplified the work of engineers and scientists.

句子的主语是 programs，谓语是 simplified，其中 developed 是主语的后置定语。

译文：在这个阶段开发的程序简化了工程师和科学家的工作。

2. In some cases, number-crunching programs made it possible to do things that would have been impossible without the aid of computers.

句中 it 为形式宾语，代指后面的不定式 to do things，而其中的 things 后带有一个由 that 引导的定语从句。

译文：在一些情况下，数字密集运算程序使得在没有计算机帮助下不可能做的事成为可能。

3. We can instruct the computer on precisely what to do under any set of conditions that arises.

译文：我们能精确地指导计算机做在任何可能发生的条件下将做的工作。

4. The third phase, which we are just entering, involves solving problems that don't have well-defined solutions.

句中主语 The third phase 后紧跟着一个非限定性定语从句，而谓语是 involves。

译文：我们正在进入的第三阶段涉及到解决我们还没能很好定义解决方案的问题。

5. As humans, we can frequently 'solve' them through 'hunches', 'educated guesses', or 'common sense' —by using information that we have but may not be able to explain.

译文：作为人，我们经常能通过使用我们具有的直觉、经验或常识解决问题，而这些我们可能也不能解释。

Key Terms

input	输入	**information system**	信息系统
input device	输入系统	**document files**	文档文件
data	数据	**worksheet files**	工作表文件
processing	处理	**database files**	数据库文件
system software	系统软件	**presentation files**	演示文件
application software	应用软件	**shopping online**	在线购物
operating system	操作系统	**connectivity**	连接性
central processing unit	中央处理单元	**computer network**	计算机网络
memory	存储器	**Internet**	互联网
primary storage	主存	**E-mail**	电子邮件
secondary storage	辅助存储	**instant messaging**	即时消息传送
output	输出	**online store**	网络商店
output device	输出设备	**keyboard**	键盘
monitor	显示器	**mouse**	鼠标
printer	打印机		

Exercises

1. Multiple Choice

Circle the letter or fill in the correct answer.

(1) A (n) _____ is an electronic device that accepts input, processes data, and produces

output.

A. input B. input device

C. output device D. computer

(2) _____ is whatever being typed, submitted, or transmitted to a computer system.

A. Input B. Output

C. Computer D. Printer

(3) A(n)_____ gathers input and transforms it into a series of electronic signals for the computer to store and manipulate.

A. output device B. input device

C. memory D. data

(4) The most important system software program is the _____.

A. application software B. system software

C. utility D. operating system

(5) In a computer, most processing takes place in a component called the _____.

A. memory B. central processing unit

C. bus D. system unit

(6) _____ is the area where data can be left on a permanent basis when it is not immediately needed for processing.

A. Secondary storage B. CMOS

C. CPU D. Primary storage

(7) _____ is the result produced by a computer.

A. Medium B. Output

C. Monitor D. Repeater

(8) _____ and the wireless revolution expand the use of computer several-fold.

A. WWW B. Router

C. EM D. Connectivity

(9) _____ is a collection of local, regional, national, and international computer networks that are linked together.

A. World Wide Web B. Network

C. Internet D. WWW

(10) _____ instructs a computer to do a specific task.

A. Program B. Instruction

C. Keyboard D. Mouse

2. Matching

Match each numbered item with the most closely related lettered item. Write your answers in the spaces provided.

A. primary storage 1. A component of computer that most processing takes place in.

B. Internet 2. A device that displays, prints, or transmits the results of

processing.

C. data
D. central processing unit
E. output device
F. document files
G. database files

3. An area of a computer that temporarily holds data waiting to be processed, stored, or output.
4. Symbols that represent facts, objects, and ideas.
5. The largest network in the world.
6. Typically created by database management programs.
7. Created by word processor to save documents.

Open-Ended

On a separate sheet of paper, respond to each question or statement.

1. Describe the character of each phrase that is divided during the computer development.

2. What is the difference between input and output? What are the most common input devices?

Reading Materials

Who Invented the Computer?

The question "Who invented the computer?" doesn't have a simple answer, because the modern digital computer evolved from a series of prototypes developed by various groups of people. A prototype is an experimental device that typically must be further developed and perfected before going into production and becoming widely available.

Between 1937 and 1942, an Iowa State University professor, John V. Atanasoff, and a graduate student, Clifford E. Berry, worked on a prototype for an electronic computer. The Atanasoff-Berry Computer (ABC) was the first to use vacuum tubes instead of mechanical switches. Its design also incorporated the idea of basing calculations on the binary number system. The ABC is often considered the first electronic digital computer.

While Atanasoff worked on the ABC, a German engineer named Konrad Zuse developed a computer called the Z3, which, like the ABC, was designed to work with binary numbers. Built in Nazi Germany during World War II, the Z3 was cloaked in secrecy, even though Hitler believed that computers had no strategic use in the war effort. Information on Zuse's invention did not surface until long after the war ended. So although Zuse was on the trail of modern computer architecture, his work had little effect on the development of computers.

Even with the work of Atanasoff and Zuse, it was not clear that computers were destined to be binary electronic devices. IBM had an entirely different computer architecture in mind. In 1939, IBM sponsored an engineer named Howard Aiken, who embarked on an audacious plan to integrate 73 IBM Automatic Accounting Machines into a single unified computing unit. What emerged was a mechanical computer officially named the IBM Automatic Sequence Controlled Calculator (ASCC), but now usually referred to as the Harvard Mark I because it was moved to Harvard University shortly after completion.

Although the Harvard Mark I was one of the first working computers, as a prototype, it strayed considerably from the path of development leading to modern computers. The Harvard Mark I was digital but used decimal rather than binary representation, which is used by today's computers. In contrast, the ABC, with its electronic vacuum tubes and binary representation, was a much closer prototype of generations of computers to come. Some computer prototypes were pressed into service barely before they were completed.

In 1943, a team headed by John W. Mauchly and J. Presper Eckert started work on ENIAC, a gigantic, general-purpose electronic computer. ENIAC (Electronic Numerical Integrator and Computer) (see Figure 1-4) was designed to calculate trajectory tables for the U. S. Army, but wasn't finished until November 1945, three months after the end of World War II. ENIAC was over 100 feet long and 10 feet high and weighed 30 tons. This gigantic machine contained over 18,000 vacuum tubes and consumed 174,000 watts of power. It could perform 5,000 additions per second and was programmed by manually connecting cables and setting 6,000 switches—a process that generally took two days to complete.

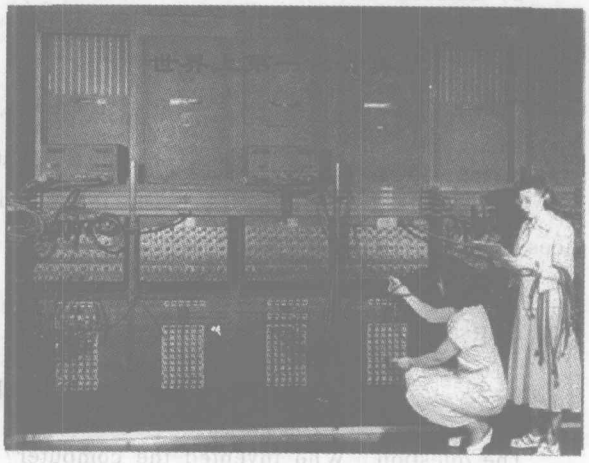

Figure1-4 ENIAC

ENIAC was formally dedicated at the Moore School of Electrical Engineering of the University of Pennsylvania on February 15,1946, and immediately pressed into service making atomic energy calculations and computing trajectories for new missile technologies. ENIAC received several upgrades and remained in service until 1955.

Generations of Computers

A computer called the UNIVAC is considered by most historians to be the first commercially successful digital computer. First generation computers can be characterized by their use of vacuum tubes, as those in Figure 1-5, to store individual bits of data. A vacuum tube (电子管) is an electronic device that controls the flow of electrons in a vacuum. Each tube can be set to one of two states. One state is assigned a value of 0 and the other a value of 1.

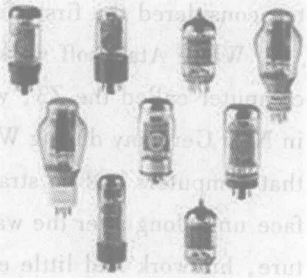

Figure1-5 Vacuum Tube

In addition to vacuum tube technology, first-generation computers can be characterized by custom application programs, made to order for the specific task the computer was to perform. Programming first-generation computers was difficult. As the computer era dawned, programmers were forced to think in 1s and 0s to write instructions in machine language. First-generation computers didn't have operating systems, as we know them today. Instead, each software application included the instructions necessary for every aspect of the compu-

ting job, including input, output, and processing activities. Programmers were quick to realize that this style of programming was terribly inefficient, they began to look for a more efficient method to standardize such routines and consolidate the into programs that any application software could access. These routines were gathered tight into operating systems, which became a characteristic of second-generation computers.

Second-generation computers used transistors (see Figure 1-6) instead of vacuum tubes. First demonstrated in 1947 by AT&T's Bell Laboratories, transistors regulate current of voltage flow and act as a switch for electronic signals. Transistors performed functions similar to vacuum tubes, but they were much smaller, cheaper, less power hungry, and more reliable. By the late 1950s, transistors had replaced vacuum tubes as the processing and memory technology for most computers.

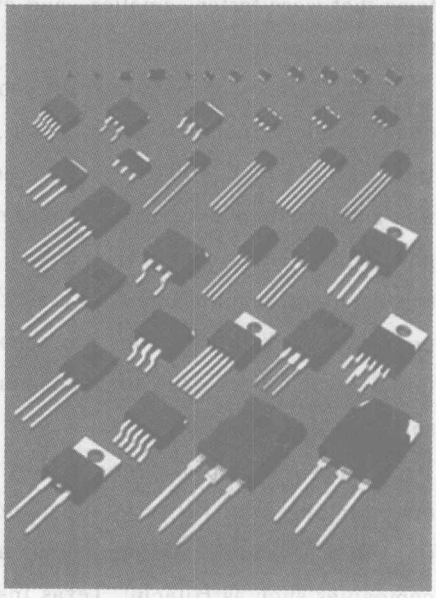

Figure1-6 Transistors

Several successful transistorized computers were manufactured by companies such as IBM, Burroughs, Control Data, Honeywell, and Sperry Rand (which was the new name given to Remington Rand after its merger with Sperry Corp). In addition to the important hardware breakthrough provided by transistors, an equally important development in software differentiated second-generation computers from their first-generation ancestors.

In addition to operating systems, second-generation computers also ran programming language compilers that allowed programmers to write instructions using English-like commands rather than the binary numbers of machine language. High-level language, such as COBOL (Business-Oriented Language) and FORTRAN (Formula Translator), were available for use on second-generation computers and remain in use today. The availability of high-level computer programming languages made it possible for third parties to develop software, and that capability was instrumental in the birth of the software industry.

Third-generation computers became possible in 1958, when Jack Kilby at Texas Instruments and Robert Noyce at Fairchild Semiconductor independently developed integrated circuits (see Figure 1-7). Integrated circuit tubes or transistors onto a single miniature chip, greatly reducing the physical size, weight, and power requirements for devices such as computers.

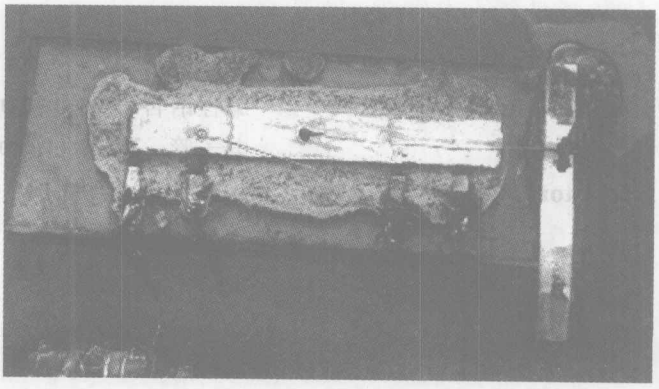

Figure1-7 Integrated Circuit

The technology for fourth-generation computers appeared in 1971, when Ted Hoff developed the first general-purpose microprocessor, called the Intel 4004. This microprocessor dramatically changed the computer industry, resulting in fourth-generation microprocessor-based computer systems that were faster, smaller, and even less expensive than third-generation computers.

Microprocessor manufactures soon flourished. Early industry leaders included Intel, Zilog, Motorola, and Texas Instruments. Intel 4004 microprocessor (see Figure 1-8) was smaller than a corn flake but matched the computing power of ENIAC. The 4004 packed the equivalent of 2300 transistors or vacuum tubes on a single chip and was able to perform 60,000 instructions per second. The 4004 was followed by the 8008, the first commercial 8-bit microprocessor, and then the 8080.

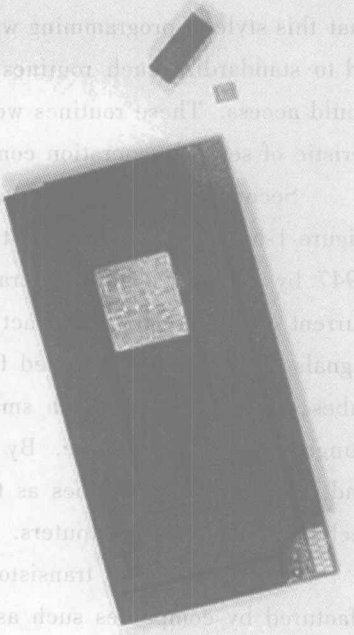

Figure1-8 Intel 4004 Microprocessor

Today, microprocessors are key components of computers—ranging from PDAs to supercomputers. Intel reigns as the world's leading microprocessor manufacturer, although microprocessors are also produced by companies such as Hitachi, Texas Instruments, Sun Microsystems, AMD, Toshiba, and Motorola.

Answer the following questions briefly.

1. How many generations are mentioned in the text?
2. What are characteristics of each generation?

Notes

1. prototype 原型
2. embark on... 开始…
3. audacious 大胆的

Key Terms

programming language	编程语言	**integrated circuit**	集成电路
vacuum tube	电子管	**microprocessor**	微处理器
transistor	晶体管		