

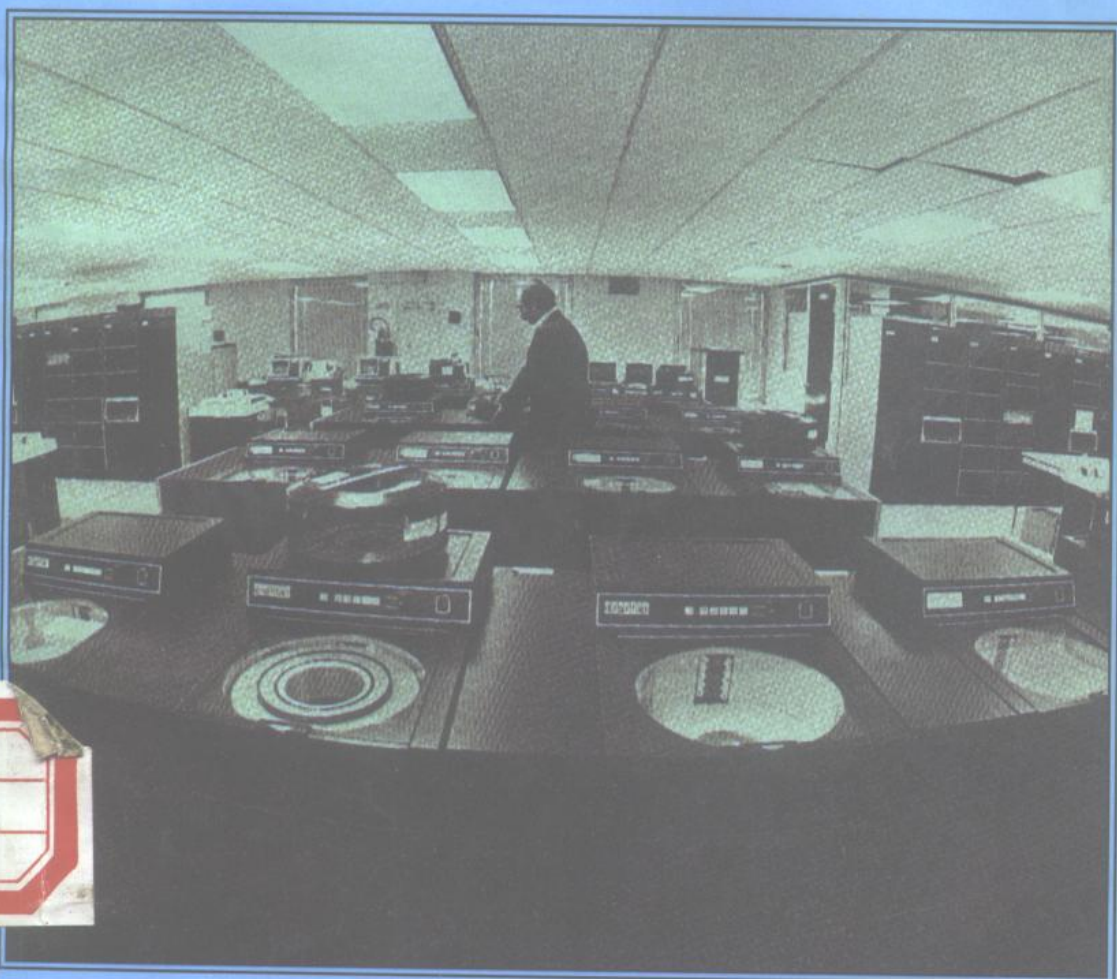
职业英语系列—BWPC—ITP 美国职业英语丛书

# Computer Science

## 计算机科学英语

(英汉对照)

[美] R.A. 迈耶斯 著  
郑大地 栾丽君 译注



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R. A. Meyers

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# Preface

This book is one of Macmillan's *Career English* series. *Career English* is intended for students who have some proficiency in English as well as a working knowledge of their own professional fields. The books are designed to teach the special terminology students need in order to communicate in English within their career areas.

Students will find the *Career English* books clear, lively, practical, and easy to use. Each chapter covers one specific topic and begins with a dialogue between an expert in the field and a student or a trainee. In the course of the dialogue, the key terms pertaining to the chapter topic are introduced in a realistic context. The dialogue is followed by a terminology practice in which each key term is defined and used in three sample sentences. At the end of each chapter, students will find a simple check-up exercise to determine whether or not they have mastered the terms introduced in the dialogue. An answer key to the check-ups is provided for self-correction. A glossary at the end of each book lists all the terms in the text with the numbers of the chapters in which they appear. In addition a cassette recording of the dialogues is available for each book. Use of the cassette is optional but highly recommended.

The books in the *Career English* series are designed to be equally useful for students studying in a classroom or independently.

*To the student:* If you are studying independently, the following suggestions will help you to use this book to its best advantage:

1. Read the dialogue from beginning to end.
2. Read the terminology practice.
3. If you have the tape, listen to it. Listen for the words in the terminology practice, paying special attention to pronunciation and intonation.
4. Reread the dialogue aloud. (If you have the tape, play it again to check your pronunciation.)
5. Do the end-of-chapter check-up to be sure you have mastered the terms introduced in the chapter. Check your answers with the answer key at the back of the book. If you have made an error in the check-up, use the terminology practice to look up the words you have not mastered. Find the terms in the dialogue, and reread the dialogue. Correct your errors.
6. Now you are ready to go on to the next chapter.

*To the teacher:* The following suggestions will help you to use this book to its best advantage in your classroom:

1. Ask students to read the dialogue silently.
2. Have them read the terminology practice to themselves.
3. If you have the tape, play it for the class. Suggest that students follow along in their books, listening carefully for the words in the terminology practice and paying careful attention to pronunciation and intonation.
4. Read each word in the terminology practice aloud, asking students to repeat after you. Check for pronunciation. Have students take turns reading the sample sentences aloud.
5. Ask two students to read the dialogue aloud, taking the parts of the characters in the dialogue. (You may wish to have several pairs of students read each dialogue.) As the dialogue is being read, help the students with their pronunciation and intonation.
6. Ask students to do the end-of-chapter check-up to be sure they have mastered the vocabulary introduced in the chapter. If students have their own books, they may write their answers directly in the book. If the books will be used by others, ask students to write their answers on separate paper.
7. Students can check their answers with the answer key at the back of the book. If they have made any errors, suggest they look up the terms in the terminology practice, reread the definitions and sample sentences, and reread the dialogue. Then have them correct their check-ups.

# 序 言

本书是《BWPC-ITP 美国职业英语》丛书中的一本。《职业英语》丛书是为具有一定专业知识同时也具有一定英语水平的学生而编写的。本丛书旨在传授一些学生们所需的专业术语,使他们能在其专业领域内用英语进行交流。

学生们会发现《职业英语》丛书具有内容清晰,讲述生动,实用且使用简便等特点。书中每课讲述了一个专题。每课的开始部分都是一位专家和一个学生或受训人之间的一段对话。在这段对话中,涉及此课主题的关键术语出现在实际场景之中。对话部分之后是术语练习。在术语练习中对每个术语都给出了定义,并且提供三个例句说明其用法。在每课的最后部分都安排有简单的检查练习,以供学生测定他们是否掌握了对话中所出现的术语。书中还提供练习答案供学生自检。另外,每一本书都配有相对应的对话录音磁带,使用磁带非常有助于本书的学习。

《职业英语》丛书既可作为课堂用书也可供学生自学使用。

学生须知:如果你使用此书自学,下列建议有助于你用好本书。

1. 从头至尾通读对话。
2. 研读术语练习。
3. 如果你有录音磁带,认真听一听。尤其注意术语练习中的生词,注意它们的发音和语调。
4. 反复朗读对话(如果你有录音磁带,可对照磁带检查你的发音)。
5. 做每课后的检查练习,以确保掌握课文中出现的术语。参照书后所附的答案检查你的答案。如果发现错误,可使用术语练习查找你没有掌握的词汇,并在对话中找到这些术语并重读对话,改正错误。
6. 上面步骤都做完后,你便可以继续学习下一篇课文了。

教师须知:下列这些建议有助于你在课堂上用好此书。

1. 要求学生默读对话。

2. 要求学生自己看术语练习。

3. 如果你有录音磁带,请在课上播放。建议学生边听边看书,并仔细听术语练习中的词汇,注意其语音和语调。

4. 朗读术语练习中的每一个生词,要求学生跟你读这些生词,检查他们的发音。要求学生轮流朗读例句。

5. 让两名学生在对话中以不同的角色朗读对话(每一组对话你都可以请几对学生来朗读)。学生朗读对话时要纠正他们的发音和语调。

6. 要求学生做课后检查练习以确保他们掌握课文中介绍的单词。如果学生自己有书可以让他们把答案直接写在书上。如果别的学生还要用这本书,就请他们把答案写在另外的纸上。

7. 学生可根据书后答案检查自己的答案。如果他们答错,建议他们在术语练习中查找该术语,重读定义和例句并重读课文。然后改正错误。

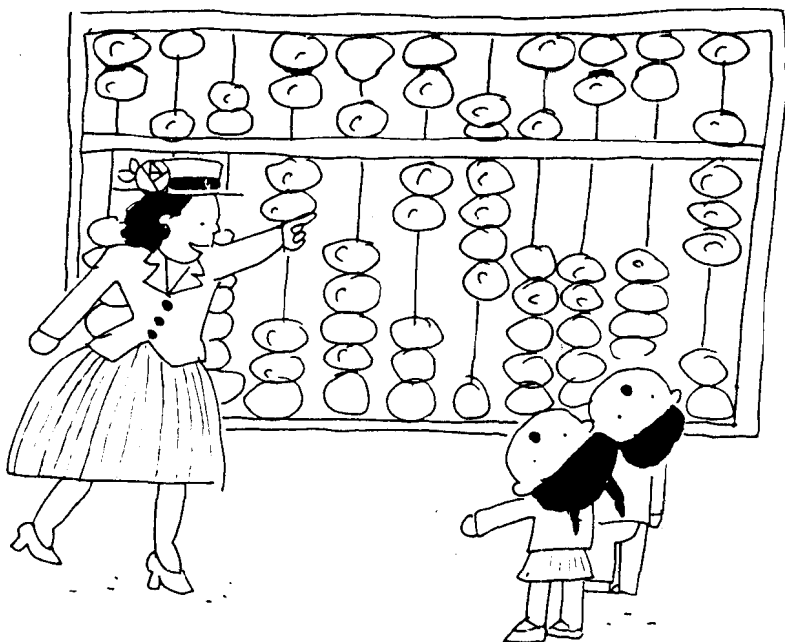
# CONTENTS

Lesson	page
1 Bits, Bytes, and Words . . . . .	1
2 The CPU . . . . .	7
3 Files . . . . .	14
4 Peripherals . . . . .	20
5 Software . . . . .	27
6 Programming Tools . . . . .	34
7 Programming Languages . . . . .	40
8 Operating Systems . . . . .	47
9 Large Systems . . . . .	53
10 The Systems Approach . . . . .	61
11 Word Processors (1) . . . . .	68
12 Word Processors (2) . . . . .	75
13 Home Computers . . . . .	83
Key to Check-Ups . . . . .	89
Appendix . . . . .	91



# 目 录

第 1 课	位、字节与字	( 1 )
第 2 课	中央处理器	( 7 )
第 3 课	文件	( 14 )
第 4 课	外围设备	( 20 )
第 5 课	软件	( 27 )
第 6 课	程序设计工具	( 34 )
第 7 课	程序设计语言	( 40 )
第 8 课	操作系统	( 47 )
第 9 课	大型系统	( 53 )
第 10 课	系统方法	( 61 )
第 11 课	文字处理器(1)	( 68 )
第 12 课	文字处理器(2)	( 75 )
第 13 课	家用计算机	( 83 )
练习答案		( 89 )
附 录		( 91 )



## LESSON

# 1

## Bits, Bytes, and Words

---

### A. Dialogue

*Student:* Do you know anything about computers?

*Programmer:* Yes, I write computer programs.

*Student:* Well, perhaps you can tell me what a bit is.

*Programmer:* Bit is short for binary digit. A binary digit is either 0 or 1. The binary system is composed of these two digits.

*Student:* What symbols are used in the decimal system?

*Programmer:* The symbols used are 0 through 9.

*Student:* So numbers are represented by different symbols when written in different systems.

*Programmer:* Correct. For example, the decimal number 13 is written as 1101 in the binary system.

*Student:* But why do computers use the binary system?

*Programmer:* Because arithmetic operations are defined by fewer rules in the binary system than in the decimal system. That's why circuits for doing binary arithmetic are much easier to build.

*Student:* But computers are used for more than arithmetic. Word processors are computers, aren't they?

*Programmer:* Of course. Bits are still used, but in word processing each character is represented by a unique code. For example, the American Standard Code for Information Interchange (ASCII) represents the letter A as 01000001.

*Student:* I assume that a character can be a letter of the alphabet, a numerical digit, or a punctuation mark.

*Programmer:* That's right. ASCII uses eight bits to define a given symbol. Groups of bits used in this fashion are called bytes.

*Student:* Are bits used to code pictures?

*Programmer:* Absolutely. For this application, tiny dots called picture elements (pixels) have certain numbers of bits assigned to them. Pictures are formed by putting many pixels together.

*Student:* Are those pixels stored as eight-bit bytes?

*Programmer:* No. They're stored as words. High-quality pictures sometimes have as many as 24 bits per pixel, so the system works with 24-bit words.

## B. Terminology Practice

**American Standard Code for Information Interchange (ASCII):** a code scheme that translates characters into binary digits

What types of computers use the ASCII coding scheme?

What special symbols does ASCII define?

The ASCII representation of a comma is 11000010.

**binary digit (bit):** 0 or 1; the smallest unit of information

Five bits are required to count from 0 to 31.

How many bits per byte are used in your company's computer?

High-quality pictures sometimes have as many as 24 bits per pixel.

**binary system:** a numbering system based on the digits 0 and 1

Binary system numbers, except 1 and 0, have more digits than the equivalent decimal system numbers.

Are there other number systems besides the binary and decimal systems?

In the binary system the symbol 10 represents the decimal number 2.

**byte:** a group of bits that represents a character and is processed as a single unit

Every character in ASCII is represented by an eight-bit byte.

A long word can consist of 4 eight-bit bytes.

Does this system use eight-bit bytes?

**character:** a graphic symbol used in writing or printing

The Roman alphabet has 26 characters.

ASCII is set up to represent 128 different characters.

What are some of the special characters?

**code:** a system of symbols for representing a language or numbers in a computer

Every computer system uses a code.

Can a code be devised to represent sounds?

Digital recording systems code sounds into 0's and 1's.

**decimal system:** a numbering system based on the digits 0 through 9

The number five is represented by the symbol 5 in the decimal system.

The decimal system consists of ten digits.

Why do we use the decimal system?

**digit:** a single symbol to which a numerical value is assigned

The number seventeen has two digits in the decimal system.

All decimal numbers less than 1,000 can be written with fewer than four digits.

How many binary digits are needed to write the number 999?

**picture element (pixel):** a small rectangular division on a video screen

Pictures are clearer when there are more bits per pixel.

How many bits per pixel were used on the Voyager probe?

The Voyager probe processed 24 bits of information per pixel.

**program:** a detailed set of instructions that directs a computer to perform specific tasks

The person who writes programs is called a programmer.

What does that program do?

This program is used by our company's accounting department.

**programmer:** a person who writes computer programs

Are you a computer programmer?

Programmers are employed by many different kinds of companies.

Our company has recently hired six new programmers.

**system:** a group of interrelated parts or elements designed to achieve a specific goal

Our company has just invested in a computer system.

How does the payroll system work?

The accounting system is very efficient in our firm.

**word:** a group of bytes processed as a single unit

Many systems use words that have 2 eight-bit bytes.

The word "the" is composed of three bytes in ASCII.

Can programmers specify word lengths in their programs?

**word processor:** a computerized text editor

Word processors are used to prepare reports in offices.

How expensive are word processors?

My cousin bought a word processor last week.

## C. Check-Up

*Fill in the blanks with the proper terms from the list.*

binary system	digit
bit	pixels
bytes	program
characters	word
decimal system	word processor

1. The \_\_\_\_\_ is based on the digits 0 and 1.
2. A computerized video picture is formed by many tiny \_\_\_\_\_.
3. The letter T and the number 5 are known as \_\_\_\_\_.
4. Detailed instructions for a computer to perform specific tasks are known as a \_\_\_\_\_.
5. A single binary digit is called a \_\_\_\_\_.
6. ASCII uses eight-bit \_\_\_\_\_ to represent characters.
7. A single symbol that represents a number is known as a \_\_\_\_\_.
8. A group of bytes, processed as a single unit, is called a \_\_\_\_\_.
9. A \_\_\_\_\_ is a computerized text editor.
10. The \_\_\_\_\_ consists of ten digits.

## 第 1 课 位、字节与字

### A. 对话

学生： 你了解计算机吗？

程序员：当然，我会编计算机程序。

学生： 那么，也许你可以告诉我什么是“bit(比特)”。

程序员：“Bit”是二进制位(binary digit)的缩写。一个二进制位或者是0,或者是1。二进制数制由这二个数字组成。

学生：十进制数制使用什么符号？

程序员：十进制数由0到9组成。

学生：如此说来,在不同的进位制中,数用不同的符号表示。

程序员：对。例如,十进制的数13,在二进制数制中写成1101。

学生：但是,为什么计算机使用二进制数制呢？

程序员：因为,与十进制相比,二进制算术运算规则要少得多。所以,建立实现二进制数运算的电路比建立实现十进制数运算的电路要容易得多。

学生：但计算机不仅仅用于计算。字处理机也是计算机,是吗？

程序员：当然是。字处理机也使用二进制位。但是,每一个字符都用唯一的一个代码表示。例如:美国信息交换标准码(简称ASCII)用01000001代表字母A。

学生：我想,一个字符可以是字母表中的某一字母,也可以是一个数字,或者是一个标点符号。

程序员：对。ASCII用八位来表示某一特定符号。以这种方式组成的位组称为字节。

学生：可以用位给图象编码吗？

程序员：完全可以。为了实现这一应用,人们用一定位数的二进制数表示图象上的一点,称其为像素。排列在一起的像素就组成了图象。

学生：像素都是以八位二进制(字节)存入的吗？

程序员：不是。它们是以字的形式储存的。高质量图象的每个像素有时用多达24位二进制表示。这样,该系统便以24位字工作。

## B. 术语

American Standard Code for Information Interchange (ASCII) 美国信息交换标准码(简称ASCII)	特),位 binary system 二进制 byte 字节 character 字符
binary digit (bit) 二进制位(比	code 代码

decimal system 十进制

digit 数字

picture element (pixel) 图象元

素(象素)

program 程序

programmer 程序员

system 系统

word 字

word processor 字处理机



## LESSON

# 2

## The CPU

---

### A. Dialogue

*Student:* What's a microprocessor?

*Programmer:* It's a very small central processing unit (CPU), manufactured on a single integrated circuit (IC) chip in a microcomputer. A microcomputer has a primary storage range of 4 to 64K characters.

*Student:* Does K stand for kilo?

*Programmer:* Not exactly. It represents 1,024, and M represents 1,048,576. Both are used to measure storage capacity. But let's get back to CPUs.

*Student:* I've heard about CPUs before. If I recall correctly, the CPU is the brain of a computer system.

*Programmer:* That's right.

*Student:* Can a microprocessor do the same operations that a larger CPU does?



- Programmer:* Yes, but on a much smaller scale. The microprocessor has the same basic architecture as a larger CPU and, therefore, similar capabilities. However, larger systems can process more data into information in less time, as well as perform more complicated operations.
- Student:* What do you mean by architecture?
- Programmer:* In computer jargon, architecture refers to the physical design or structure of a system's hardware.
- Student:* Can you tell me something about the CPU?
- Programmer:* I can give you a general idea of what's inside it. First there's the control unit. Its task is to interpret program instructions and direct the rest of the unit to execute the instruction. The second part of the CPU is the arithmetic-logic unit (ALU).
- Student:* I assume this part of the CPU must perform all the mathematical calculations.
- Programmer:* And the logic operations, also. For instance, it can be used to compare groups of characters.
- Student:* I see. Can this logic capability be used to search for a name in a list of names?
- Programmer:* Yes, it can. Now that you understand that, let me tell you about the third CPU component—primary-storage. Primary storage is the computer memory. It's composed of RAM and ROM.
- Student:* I've seen these terms, too. RAM stands for random access memory, and ROM stands for read only memory. But what do these words mean?
- Programmer:* RAM refers to the computer's capacity to store information while it is turned on. If the information is to be retrieved at a later time, it must be transferred to another storage device or it will be lost when the computer is turned off.
- Student:* And what's the ROM used for?
- Programmer:* The ROM is the part of primary storage that holds permanent information that can't be altered by program instructions.

## B. Terminology Practice

**architecture:** any design or orderly arrangement of either hardware or software

All computer hardware architecture contains input, output, CPU, and storage units.

Many courses are offered in computer architecture.

Is the structure of the ALU considered architecture?