Lesson 1

Text

How PCs Work

When you mention the word "technology", most people think about computers. Virtually every facet of our lives has some computerized component. The appliances in our homes have microprocessors built into them, as do our televisions. Even our cars have a computer. But the computer that everyone thinks of first is typically the personal computer, or PC.

A PC is a general-purpose tool built around a microprocessor. It has lots of different parts—memory, a hard disk, a MODEM, etc. — that work together. "General-purpose" means that you can do many different things with a PC. You can use it to type documents, send E-mail, browse the Web and play games.

In this article, we will talk about PCs in the general sense and all the different parts that go into them. You will learn about the various components and how they work together in a basic operating session.

1. On the Inside

Let's take a look at the main components of a typical desktop computer.

- Central processing unit (CPU) — The microprocessor, "brain" of the computer system, is called the central processing unit. Everything that a computer does is overseen by the CPU.
- Memory — This is very fast storage used to hold data. It has to be fast because it connects directly to the microprocessor. There are several specific types of memory in a computer:
  - ⊙ Random-access memory (RAM) —Used to temporarily store information that the computer is currently working with.
  - ⊙ Read-only memory (ROM) — A permanent type of memory storage used by the computer for important data that does not change.
  - ⊙ Basic input/output system (BIOS) — A type of ROM that is used by the computer to establish basic communication when the computer is first turned on.
  - ⊙ Caching — The storing of frequently used data in extremely fast RAM that connects directly to the CPU.
  - ⊙ Virtual memory — Space on a hard disk used to temporarily store data and swap it in and out of RAM as needed.
- Motherboard—This is the main circuit board that all of the other internal components connect

to. The CPU and memory are usually on the motherboard. Other systems may be found directly on the motherboard or connected to it through a secondary connection. For example, a sound card can be built into the motherboard or connected through PCI (Peripheral Component Interconnect).

- Power supply—An electrical transformer regulates the electricity used by the computer.
- Hard disk—This is large-capacity permanent storage used to hold information such as programs and documents.
- Operating system—This is the basic software that allows the user to interface with the computer.
- Integrated Drive Electronics (IDE) Controller—This is the primary interface for the hard drive, CD-ROM (Compact Disc, Read-Only Memory) and floppy disk drive.
- PCI Bus—The most common way to connect additional components to the computer, PCI uses a series of slots on the motherboard that PCI cards plug into.
- Small Computer System Interface (SCSI) —Pronounced "scuzzy", the small computer system interface is a method of adding additional devices, such as hard drives or scanners, to the computer.
- Accelerated Graphics Port (AGP) —AGP is a very high-speed connection used by the graphics card to interface with the computer.
- Sound card—This is used by the computer to record and play audio by converting analog sound into digital information and back again.
- Graphics card—This translates image data from the computer into a format that can be displayed by the monitor.

2. Connections

2.1 Input/Output

No matter how powerful the components inside your computer are you need a way to interact with them. This interaction is called input/output (I/O). The most common types of I/O in PCs are:

- Monitor—The monitor is the primary device for displaying information from the computer.
- Keyboard—The keyboard is the primary device for entering information into the computer.
- Mouse—The mouse is the primary device for navigating and interacting with the computer.
- Removable storage devices—Removable storage devices allow you to add new information to your computer very easily, as well as save information that you want to carry to a different location.
  - ⊙ Floppy disk—The most common form of removable storage, floppy disks are extremely inexpensive and easy to save information to.
  - ⊙ CD-ROM—CD-ROM is a popular form of distribution of commercial software. Many systems now offer CD-R (recordable) and CD-RW (rewritable), which can also record.
  - ⊙ Flash memory—Based on a type of ROM called electrically erasable programmable read-

only memory (EEPROM). Flash memory provides fast, permanent storage. CompactFlash, SmartMedia and PCMCIA cards are all types of Flash memory.

⊙ DVD-ROM—DVD-ROM (digital versatile disc, read-only memory) is similar to CD-ROM but is capable of holding much more information.

2.2 Ports

- Parallel—This port is commonly used to connect a printer.
- Serial—This port is typically used to connect an external MODEM.
- Universal Serial Bus (USB)—Quickly becoming the most popular external connection, USB ports offer power and versatility and are incredibly easy to use.
- FireWire (IEEE 1394)—FireWire is a very popular method of connecting digital-video devices, such as camcorders or digital cameras, to your computer.

2.3 Internet/Network

- MODEM—This is the standard method of connecting to the Internet.
- Local area network (LAN) card—This is used by many computers, particularly those in an Ethernet office network, to connect each other.
- Cable MODEM—Some people now use the cable-television system in their home to connect to the Internet.
- Digital Subscriber Line (DSL) MODEM—This is a high-speed connection that works over a standard telephone line.
- Very high bit-rate DSL (VDSL) MODEM—A newer variation of DSL, VDSL requires that your phone line have fiber-optic cables.

3. From Power-up to Shut-down

3.1 BIOS

Now that you are familiar with the parts of a PC, let's see what happens in a typical computer session, from the moment you turn the computer on until you shut it down.

A. You press the "On" button on the computer and the monitor.

B. You see the BIOS software doing its thing, called the power-on self-test (POST). On many machines, the BIOS displays text describing such data as the amount of memory installed in your computer and the type of hard disk you have. During this boot sequence, the BIOS does a remarkable amount of work to get your computer ready to run.

- The BIOS determines whether the video card is operational. Most video cards have a miniature BIOS of their own that initializes the memory and graphics processor on the card. If they do not, there is usually video-driver information on another ROM on the motherboard that the BIOS can load.
- The BIOS checks to see if this is a cold boot or a reboot. It does this by checking the value at

memory address 0000:0472. A value of 1234h indicates a reboot, in which case the BIOS skips the rest of POST. Any other value is considered a cold boot.

- If it is a cold boot, the BIOS verifies RAM by performing a read/write test of each memory address. It checks for a keyboard and a mouse. It looks for a PCI bus and, if it finds one, checks all the PCI cards. If the BIOS finds any errors during the POST, it notifies you with a series of beeps or a text message displayed on the screen. An error at this point is almost always a hardware problem.
- The BIOS displays some details about your system. This typically includes information about the following:
  - ⊙ Processor;
  - ⊙ Floppy and hard drive;
  - ⊙ Memory;
  - ⊙ BIOS revision and date;
  - ⊙ Display.
- Any special drivers, such as the ones for SCSI adapters, are loaded from the adapter and the BIOS displays the information.

The BIOS looks at the sequence of storage devices identified as boot devices in the CMOS Setup. "Boot" is short for "bootstrap", as in the old phrase "Lift yourself up by your bootstraps". Boot refers to the process of launching the operating system. The BIOS tries to initiate the boot sequence from the first device using the bootstrap loader.

C. The bootstrap loader loads the operating system into memory and allows it to begin operation. It does this by setting up the divisions of memory that hold the operating system, user information and applications. The bootstrap loader then establishes the data structures that are used to communicate within and between the sub-systems and applications of the computer. Finally, it turns control of the computer over to the operating system.

3.2 Operating System

Once loaded, the operating system's tasks fall into six broad categories:

- Processor management—Breaking the tasks down into manageable chunks and prioritizing them before sending to the CPU.
- Memory management—Coordinating the flow of data in and out of RAM and determining when virtual memory is necessary.
- Device management—Providing an interface between each device connected to the computer, the CPU and applications.
- Storage management—Directing where data will be stored permanently on hard drives and other forms of storage.
- Application Interface—Providing a standard communications and data exchange between software programs and the computer.
- User Interface—Providing a way for you to communicate and interact with the computer.

You open up a word processing program and type a letter, save it and then print it out. Several components work together to make this happen:

- The keyboard and mouse send your input to the operating system.
- The operating system determines that the word-processing program is the active program and accepts your input as data for that program.
- The word-processing program determines the format that the data is in and, via the operating system, stores it temporarily in RAM.
- Each instruction from the word-processing program is sent by the operating system to the CPU. These instructions are intertwined with instructions from other programs that the operating system is overseeing before being sent to the CPU.
- All this time, the operating system is steadily providing display information to the graphics card, directing what will be displayed on the monitor.
- When you choose to save the letter, the word-processing program sends a request to the operating system, which then provides a standard window for selecting where you wish to save the information and what you want to call it. Once you have chosen the name and file path, the operating system directs the data from RAM to the appropriate storage device.
- You click on "Print". The word-processing program sends a request to the operating system, which translates the data into a format the printer understands and directs the data from RAM to the appropriate port for the printer you requested.

You open up a Web browser and check out "HowStuffWorks". Once again, the operating system coordinates all of the action. This time, though, the computer receives input from another source, the Internet, as well as from you. The operating system seamlessly integrates all incoming and outgoing information.

- You close the Web browser and choose the "Shut Down" option.
- The operating system closes all programs that are currently active. If a program has unsaved information, you are given an opportunity to save it before closing the program.
- The operating system writes its current settings to a special configuration file so that it will boot up next time with the same settings.

If the computer provides software control of power, then the operating system will completely turn off the computer when it finishes its own shut-down cycle. Otherwise, you will have to manually turn the power off.

New Words

technology	[tekˈnɔlədʒi]	*n.* 工艺，科技，技术
computer	[kəmˈpjuːtə]	*n.* 计算机，电脑
virtually	[ˈvəːtjuəli]	*adv.* 事实上，实际上，实质上

facet	[ˈfæsit]	*n*. 方面；（多面体的）面
computerize	[kəmˈpjuːtəraiz]	*vt*. 用计算机处理，使计算机化
component	[kəmˈpəunənt]	*n*. 部件
		adj. 组成的，构成的
appliance	[əˈplaiəns]	*n*. 设备，器械，装置
microprocessor	[maikrəuˈprəusesə]	*n*. 微处理器
oversee	[ˌəuvəˈsiː]	*vt*. 监督，监视；管理
memory	[ˈmeməri]	*n*. 存储器，内存
MODEM	[ˈməudəm]	*n*. 调制解调器
document	[ˈdɔkjumənt]	n. 文件，文档，公文
session	[ˈseʃən]	*n*. 对话期，运行期
type	[ˈtaip]	*n*. 类型，型，种类，样式
		v. 打字
E-mail	[ˈiːmeil]	*n*. 电子邮件
desktop	[ˈdesktɔp]	*adj*. 台式的，桌面的
		n. 桌面
storage	[ˈstɔridʒ]	*n*. 存储
data	[ˈdeitə]	*n*. 数据，资料
temporarily	[ˈtempərərili]	adj. 暂时的，临时的
store	[stɔː]	*vt*. 存储
information	[ˌinfəˈmeiʃən]	*n*. 信息
permanent	[ˈpəːmənənt]	*adj*. 永久的，持久的
establish	[isˈtæbliʃ]	*vt*. 建立，设立
communication	[kəˌmjuːniˈkeiʃn]	*n*. 通讯，通信
cache	[kæʃ]	*n*. 高速缓冲存储器
frequently	[ˈfriːkwəntli]	*adv*. 常常，频繁地，经常地
swap	[swɔp]	*v*. 交换
		n. 交换
motherboard	[ˈmʌðəbɔːd]	*n*. 主板，母板
transformer	[trænsˈfɔːmə]	*n*. 变压器
regulate	[ˈregjuleit]	*vt*. 管理，调整，控制，调节
capacity	[kəˈpæsiti]	*n*. 容量
program	[ˈprəugræm]	*n*. 程序
interface	[ˈintəfeis]	*n*. 界面，接口
software	[ˈsɔftwɛə]	*n*. 软件
controller	[kənˈtrəulə]	*n*. 控制器
bus	[bʌs]	*n*. 总线
plug	[plʌg]	*vt*. 插上
		n. 插头，插销

analog	[ˈænəlɔg]	*n*. 模拟
digital	[ˈdidʒitl]	*adj*. 数字的，数位的
		n. 数字，数字式
record	[ˈrekɔːd]	*n*. 纪录
		vt. 记录
audio	[ˈɔːdiəu]	*adj*. 音频的，声频的
format	[ˈfɔːmæt]	*n*. 格式
		vt. 格式化（磁盘）
display	[diˈsplei]	*vt*. 显示
		n. 显示，显示器
monitor	[ˈmɔnitə]	*n*. 监视器
		v. 监控
input	[ˈinput]	*n*. 输入
		v. 输入
output	[ˈautput]	*n*. 输出
		v. 输出
interaction	[ˌintərˈækʃən]	*n*. 交互作用
keyboard	[ˈkiːbɔːd]	*n*. 键盘
mouse	[maus]	*n*. 鼠标
removable	[riˈmuːvəbl]	*adj*. 可拆卸的，可移动的
location	[ləuˈkeiʃən]	*n*. 位置，场所
extremely	[ikstˈriːmli]	*adv*. 极端地，非常地
inexpensive	[ˌiniksˈpensiv]	*adj*. 便宜的，不贵重的
provide	[prəˈvaid]	*v*. 提供，供应，供给
parallel	[ˈpærəlel]	*adj*. 并行的
printer	[ˈprintə]	*n*. 打印机
port	[pɔːt]	*n*. 端口
serial	[ˈsiəriəl]	*adj*. 串行的，连续的
versatility	[ˌvəːsəˈtiləti]	*n*. 多功能性
camcorder	[ˈkæmkɔːdə]	*n*. 便携式摄像录音一体机
Internet	[ˈintənet]	*n*. 因特网，互联网
moment	[ˈməumənt]	*adj*. 片刻的，瞬间的
		n. 瞬间
boot	[buːt]	*v*. 导入，引导，启动
determine	[diˈtəːmin]	*v*. 决定，确定，测定
load	[ləud]	*n*. 负荷，加载
		vt. 装载，装入
check	[tʃek]	*vt*. 检查
address	[əˈdres]	*n*. 地址

		vt. 处理
indicate	[ˈindikeit]	*vt*. 指出，指明
beep	[biːp]	*n*. 蜂鸣声，哔哔声
		v. 嘟嘟响
message	[ˈmesidʒ]	*n*. 消息
detail	[ˈdiːteil]	*n*. 细节，详情
		vt. 详述，详解
hardware	[ˈhaːdwɛə]	*n*. 硬件
driver	[ˈdraivə]	*n*. 驱动器，驱动程序
category	[ˈkætiɡəri]	*n*. 种类，类目，部属，类别
instruction	[inˈstrʌkʃən]	*n*. 指令
save	[seiv]	*vt*. 保存
request	[riˈkwest]	*vt*. 请求，要求
		n. 请求，要求
click	[klik]	*v*. 单击，点击
browser	[brauzə]	*n*. 浏览器
receive	[riˈsiːv]	*vt*. 收到，接到，接收
option	[ˈɔpʃən]	*n*. 选项
active	[ˈæktiv]	*adj*. 活动的

Phrases

hard disk	硬盘
work with …	与……共事，与……合作，对……起作用
turn on	打开
virtual memory	虚拟内存
circuit board	电路板
connect to …	连接到……
power supply	电源
operating system	操作系统
floppy disk drive	软盘驱动器
sound card	声卡
as well as	也，又
base on …	基于……
digital camera	数码相机
fiber-optic cables	光缆
data exchange	数据交换
interact with…	与……交互，与……相互作用

shut down	关闭机器
turn off	关闭

Abbreviations

PC (Personal Computer)	个人计算机
CPU (Central Processing Unit)	中央处理器
RAM (Random-Access memory)	随机存储器
ROM (Read-Only Memory)	只读存储器
BIOS (Basic Input/Output System)	基本输入/输出系统
IDE (Integrated Drive Electronics)	电子集成驱动器
PCI (Peripheral Component Interconnect)	外部设备接口
SCSI (Small Computer System Interface)	小型计算机系统接口
CD-ROM (Compact Disc, Read-Only Memory)	只读光盘
EEPROM (Electrically Erasable Programmable Read-Only Memory)	电可擦除只读存储器
DVD-ROM (Digital Versatile Disc, Read-Only Memory)	只读数字化视频光盘
USB (Universal Serial Bus)	通用串行总线
LAN (Local Area Network)	局域网
DSL (Digital Subscriber Line)	数字用户线
VDSL (Very high bit-rate DSL)	超高速数字用户线
POST (Power-On Self-Test)	开机自检

Notes

[1] But the computer that everyone thinks of first is typically the personal computer, or PC.

本句中，that everyone thinks of first 是一个限定性定语从句，修饰和限定 the computer。that 在从句中作宾语，可以省略。or 引导同义词或说明语，意思是“或者说，即”。

[2] No matter how powerful the components inside your computer are you need a way to interact with them.

本句中，No matter how powerful the components inside your computer are 是一个让步状语从句，修饰谓语 need。

英语中，no matter 后面可以跟疑问代词 who、whom、which、what 或疑问副词 how、where，构成让步状语从句。请看下例：

No matter what you do you should put your heart into it.

无论做什么事情你都应该全心全意去做。

No matter how hard he tried he just couldn't solve the problem.

无论他多么努力，就是解决不了这个问题。

[3] Now that you are familiar with the parts of a PC, let's see what happens in a typical computer session, from the moment you turn the computer on until you shut it down.

本句中，Now that you are familiar with the parts of a PC 是一个原因状语从句，修饰谓语 let，from the moment you turn the computer on until you shut it down 对 a typical computer session 作进一步补充说明。

［4］On many machines，the BIOS displays text describing such data as the amount of memory installed in your computer and the type of hard disk you have.

本句中，describing such data as the amount of memory installed in your computer and the type of hard disk you have 是一个现在分词短语作定语，修饰和限定 text。在该短语中，installed in your computer 是一个过去分词短语，作定语修饰和限定 the amount of memory，you have 是一个定语从句，修饰和限定 the type of hard disk。

［5］The word-processing program sends a request to the operating system，which translates the data into a format the printer understands and directs the data from RAM to the appropriate port for the printer you requested.

本句中，which translates the data into a format the printer understands and directs the data from RAM to the appropriate port for the printer you requested 是一个非限定性定语从句，对 the operating system 作进一步补充说明。the printer understands 和 you requested 是定语从句，分别修饰和限定 a format 及 the appropriate port for the printer。

Grammar

定语从句

在复合句中，修饰某一个名词或代词的从句称为定语从句。定语从句所修饰的名词或代词称为先行词。定语从句放在先行词的后面。请看下例：

【例】Do you know the man who will give us a talk on computer science tomorrow?

你认识明天要给我们作关于计算机科学的报告的那个人吗?

句中，who will give us a talk on computer science tomorrow 是定语从句，the man 是先行词。

【例】This is the software that I would like to buy.

这就是我想买的那个软件。

句中，that I would like to buy 是定语从句，the software 是先行词。

【例】He will never forget the day when he bought his own computer.

他永远都不会忘记自己买到计算机的那一天。

句中，when he bought his own computer 是定语从句，the day 是先行词。

通常，定语从句都由关系代词 that、which、who、whom、whose 和关系副词 when、where、why、how 引导。关系代词和关系副词往往放在先行词和定语从句之间，起联系作用，同时又作定语从句的一个成分。

定语从句可分为限定性定语从句和非限定性定语从句两类，以下分述之。

1. 限定性定语从句

限定性定语从句使修饰的词代表一个（些）或一类特定的人或物。如果修饰人，一般

用关系代词 who，有时也用 that。若关系代词在句子中作主语，则 who 用得较多且不可省略。请看下例：

【例】Those who agree with me please put up your hands.

同意我的观点的人请举手。

句中，who agree with me 是定语从句，修饰 Those。who 既是引导词，又在句中作主语，who 不能省略。

【例】Who is the man that is checking the printer over there?

在那边检查打印机的那个人是谁？

句中，that is checking the printer over there 是定语从句，修饰 the man。that 既是引导词，又在句中作主语，that 不能省略。

若关系代词在句子中作宾语，就应当使用宾格 whom 或 that，但在大多数情况下都可省略。若表示所属，就应用 whose。请看下例：

【例】He is the professor（whom）you've been looking for.

他就是你一直在寻找的教授。

句中，（whom）you've been looking for 是定语从句，修饰 the professor。whom 在从句中作 looking for 的宾语，故可省略。

【例】He is a man（that）you can depend on.

他是一个可以信赖的人。

句中，（that）you can depend on 是定语从句，修饰 a man。that 在从句中作 depend on 的宾语，故可省略。

【例】PCTOOLS are tools whose functions are very advanced.

PCTOOLS 是功能很先进的工具。

句中，whose functions are very advanced 是定语从句，修饰 tools。因为 functions 和 tools 之间是所属关系，所以用所有格 whose。

限定性定语从句如果修饰物，用 that 较多，也可用 which。它们可在句中作主语，也可作宾语。若作宾语，则大多可省略。请看下例：

【例】Some floppy disk drives that use 5.25-inch floppy disks have a lever that you need to push down or to the side after inserting the floppy disk.

一些用 5.25 英寸软盘的软盘驱动器有一个柄。在插入软盘之后，要把柄扳下来。

句中，that use 5.25-inch floppy disks 和 that you need to push down or to the side 是两个定语从句，分别修饰 some floppy disk drives 和 a lever，但第一个 that 不能省略，因为它在句中作主语。而第二个 that 则可省略，因为它在句中作 push 的宾语。

【例】Electricity is a form of energy which can be transmitted easily.

电是易输送的一种能量。

句中，which 引导的定语从句修饰 energy。因为 which 在从句中作主语，所以不能省略。

【例】Mouse is an instrument which operators often use.

鼠标是操作员经常使用的一种工具。

句中，which 引导的定语从句修饰 an instrument。因为 which 在从句中作 use 的宾语，所以可以省略。

当限定性定语从句所修饰的先行词是 that、all、only、everything、something、nothing 等代词，或者先行词前有一个最高级的形容词修饰时，则用 that 引导。但 that 若在从句中作宾语，则可省略。请看下例：

【例】It there anything I can do for you?

我能为你做些什么呢?

句中，先行词是 anything，故 that 省略。

【例】This is the most advanced computer we have ever seen.

这是我们所看过的最先进的计算机。

句中，先行词 computer 前面由最高级形容词 the most advanced 修饰，故 that 省略。

【例】AutoCAD is the best software that is found in CAD.

AutoCAD 是 CAD 领域中所找到的最好的软件。

句中，虽然由形容词的最高级 the best 修饰 software，但因 that 在定语从句中作主语，所以不能省略。

当限定性定语从句修饰一个表示时间的名词时，使用关系副词 when；当限定性定语从句修饰一个表示地点的名词时，使用 where；关系副词 why 的先行词通常是 reason。请看下例：

【例】The time will come when man can fly to outer space freely.

人类能自由地飞向外层空间的时代将会到来。

句中，先行词是 the time，故使用 when 引导。

【例】That's the place where we bought our printer.

那就是我们买打印机的地方。

句中，先行词 the place 是一个地点名词，故使用 where 引导。

【例】Do you know the reason why there are viruses in the computer?

你知道这台计算机中为什么会有病毒吗?

句中，先行词是 the reason，所以使用 why 引导。

2. 非限定性定语从句

非限定性定语从句一般用于对所修饰的名词或代词作进一步的说明，但也可对整个句子进行说明。它在修饰人时用 who、whom 或 whose，修饰物时用 which。请看下例：

【例】We do experiments with a computer, which helps to do many things.

我们利用计算机做实验，计算机可帮助做许多工作。

句中，which 引导的非限定性定语从句是对先行词 a computer 的说明。

【例】He arrived late, which was annoying.

他很迟才到，这真叫人恼火。

句中，which 引导的非限定性定语从句是修饰它前面的整个句子。

【例】Yesterday I met your Manager, who seemed to be very worried.

昨天我遇见你们经理，他好像很忧虑。

句中，who 引导的非限定性定语从句是对先行词 your Manager 的说明。非限定性定语从句也可由 where 或 when 引导。请看下例：

【例】They are going to buy a laser printer next week, when they will be free.

他们打算下周去买一台激光打印机，那时他们有空。

【例】They'll fly to America, where they plan to stay for a month.

他们将飞往美国，计划在那逗留一个月。

3. 限定性定语从句与非限定性定语从句的区别

限定性定语从句与主句的关系十分密切，它是整个句子必不可少的一个部分。如果把它去掉，句子的意思就不完整。而非限定性定语从句与主句的关系并不十分密切，它只是对所修饰的词或句子进行进一步说明，去掉之后句子的其他部分仍可成立。

限定性定语从句紧跟在它所修饰的词之后，而非限定性定语从句通常和句子的其他部分用逗号隔开。

在翻译中，限定性定语从句常译为定语，即“……的”；而非限定性定语从句常可译为一个并列的句子。

另外，非限定性定语从句不用 that 引导，这一点应加以注意。

4. 介词前置的定语从句

在口语中，若关系代词在从句中作介词的宾语时，通常用 whom、which 或 that 引导。此时，介词放在句子的后面，关系代词可以省略。但是，在正式书面语，特别是在科技英语中，介词放在关系代词之前。此时，只能使用关系代词 whom 或 which 引导，且不能省略关系代词。请看下例：

【例】Have you met the person about whom he was speaking?

你见过他说的那个人吗？

【例】A box within a dialog box in which you type information needed to carry out a command.

对话盒中的一个盒子，可以给该盒中输入执行一个命令所需的信息。

句中，in which…是一个介词前置的定语从句，修饰和限定 a box。

关系代词 whom 或 which 还可以作“动词词组”后面的介词的宾语。此时，应注意动词与介词的搭配。请看下例：

【例】The only thing about which he is not sure is how to use this tool.

他唯一没有把握的是如何使用这个工具。

句中的动词词组是 be sure about。

定语从句还可以由名词（代词）+ of + which（whom）来引导，表示部分与整体的关系。注意不要误用 which 和 whom。请看下例：

【例】Our manager knows a lot of people, many of whom are professors.

我们经理认识许多人，其中好多是教授。

句中，whom 用来指人，具体就是指 people。

【例】She bought many books yesterday, all of which are on computer.

她昨天买了许多书，全是关于计算机方面的。

句中，which 指物，具体就是指 books。

Exercises

一、根据课文内容，判断以下叙述的正误。

（1）You can use PC to do a lot of things, such as type documents, send E-mail, browse the Web and play games.

（2）Memory is the brain of the computer.

（3）CPU oversees everything that a computer does.

（4）A sound card can only be built into the motherboard.

（5）Hard disks are used to hold information such as programs and documents.

（6）The monitor is the primary device for displaying information from the computer while the mouse is the primary device for navigating and interacting with the computer.

（7）A printer is usually connected into a serial port.

（8）An external MODEM is usually connected into a parallel port.

（9）Digital Subscriber Line（DSL）MODEM is a high-speed connection that works over a standard telephone line.

（10）Memory management is to coordinate the flow of data in and out of RAM and determine when virtual memory is necessary.

二、根据课文内容填空。

（1）CPU stands for _____.

（2）BIOS stands for _____.

（3）Motherboard is _____.

（4）Operating system is _____.

（5）Peripheral Component Interconnect（PCI）Bus is _____.

（6）The keyboard is _____.

（7）The most common form of removable storage is _____.

（8）Many computers, particularly _____, use LAN card to _____ _____.

（9）Device management is to _____.

（10）The operating system sends _____from the word-processing program to _____.

三、指出下列句子中的定语从句，然后把句子译成汉语。

（1）The room where we put our computers is very big.

（2）Users who are requiring the full color capabilities of the color VGA monitor will find that the color VGA monitor is a perfect choice.

（3）Do you know the reason why there are heat losses in a steam engine?

（4）The material which allows electric current to flow easily is called a conductor.

（5）Tom is the student whose father works in AAA Computer Company.

(6) They have invited us to visit their country, which is very kind of them.

(7) Iron is converted into steel by various processions, all of which involve heating it to very high temperatures.

(8) You should put the printer in a place where it is away from sunlight.

(9) The seventeenth century was one in which many significant advances were made in both science and philosophy.

(10) Galileo lived in the city of Pisa, where there is a leaning tower about 180 feet high.

四、选择与以下各条叙述意义最接近的词汇。

(1) One that is particularly concerned with the manipulation of files of numeric and non-numeric data and with the production of reports.

(2) One that is used mainly for the manipulation of numeric data.

(3) One that is designed to allow a programmer to make changes and corrections from a terminal during execution.

(4) One in which the user does not specify the sequences of operations that are to be performed to obtain a problem's solution.

(5) One that allows the programming of procedures that can be executed concurrently and can be activated in response to external signals as required.

供选择的答案:

A. interactive language

B. real-time language

C. scientific language

D. non-procedural language

E. commercial language

五、听句子,在画线处填写所听到的单词或词组。

(1) A personal computer (PC) is any _____ whose original sales price, size and capabilities make it useful for individuals.

(2) Today a PC may be a _____, a laptop computer or a tablet computer.

(3) Modern personal computers often have high-speed or dial-up connections to the Internet, allowing access to the _____ and a wide range of other resources.

(4) A PC may be a home computer, or may be found in an office, often connected to a _____.

(5) A desktop computer is an independent personal computer (PC), as opposed to smaller forms of PCs, such as a mobile _____.

(6) Desktop computers come in a variety of styles ranging from large vertical _____ to small form factor models that can be tucked behind an LCD monitor.

(7) Most modern desktop computers have separate screens and _____.

(8) A laptop computer or simply laptop, also called a notebook computer or sometimes a notebook, is a small personal computer _____ for mobility.

(9) Usually all of the interface hardware needed to operate the laptop, such as _____and serial ports, graphics card, sound channel, etc., are built in to a single unit. Most laptops contain batteries to facilitate operation without a readily available electrical outlet.

(10) The ultra-mobile PC (UMPC) is a _____for a small form factor tablet PC.

六、计算机软件水平考试真题自测(程序员级):单项选择题。

(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

Skill Training

个人简历

简历(Resume)并没有固定不变的格式。应聘者应根据个人的具体情况、针对应聘企业的要求,选择恰当的形式,呈现适当的内容来设计、制作简历。

1. 简历的类型

一般来说,依据不同的侧重点,有以下三种类型。

1.1 以学历为主的简历(Basic Resume)

以学历为主的简历适应于应届毕业生,供其毕业求职使用。因为没有丰富的工作经历,所以把重点放在学业上,从最高学历写起。

1.2 以经历为主的简历(Chronological Resume)

以经历为主的简历往往侧重于工作经历。通常,根据应聘职位的要求,展现相关经历和业绩。一般按时间顺序书写出来,先写工作经历,再写学历。经历和学历的时间顺序均是由近及远。

1.3 以职能为主的简历（Functional Resume）

以职能为主的英语简历也是突出工作经历，因而所含元素与以经历为主的简历相同。两者的差别在于：以经历为主的简历是按时间顺序来排列工作经历，而以职能为主的简历则按工作职能或性质来概括工作经历，并无时间上的连贯性，旨在强调某些特定的工作能力和适应程度。例如，曾经在两个不同的工作单位担任相同的职务或负责相同的业务，便可归纳在一个项目之中。

2. 注意事项

2.1 充分了解招聘公司的要求

很多求职者都忽视了需要了解招聘公司情况，了解未来雇主的兴趣与问题。关于大多数公司的信息资料都是很丰富的，可以通过图书馆、杂志或因特网来搜集信息。关键在于要把自身情况与对方的要求相结合，根据对方需要来选择谈论你做过什么、能做什么，招聘者知道你能给公司带来何种效益。投放简历前一定要看清楚招聘方的要求，不要大撒网，既浪费钱，又容易打击自信心。不如根据自己的具体情况，精心选择，有的放矢地投递几家。

2.2 使简历醒目

在招聘现场，可以观察别人的简历都是用什么做封面包装，如果你的包装材料与众不同，就更容易被重视。

另外，简历封面的作用很大，招聘人员在拿起简历的时候，首先看到就是封面。设计精致或者别致的封面总会让人产生阅读的兴趣。在简历的包装上，要想让你的简历更为醒目显眼，最简单的方法就是做一个别致的简历封面。

对于电子简历而言，一般是通过邮件发送到对方邮箱，就没有封面的概念了，不过现在的邮箱都支持 html 格式，所以可以利用 html 格式设计表格、背景颜色、加粗字体，等等，这样比起纯文本格式的简历自然要好看得多，也方便阅读。发送简历的时候，一般不要以附件形式发送，因为接收者害怕附件中带有病毒。

2.3 有所保留

有一些事情最好还是留待面试时，而不是在简历中说明。原因很明显：这些事情可能会对求职者的录用带来不利。这些事情包括薪金要求、开始上班的时间，等等。你的目的是获得面试机会，如果他们真正认为你是合适的人选，那么在和他们面对面接触时，你可以提出这些求职中的棘手问题。

2.4 其他

注意以下问题：

（1）切忌简历中出现跳字、文字高低不平、用改正液涂改的痕迹。

（2）避免你所熟悉的缩写，招聘人员未必了解专业术语的缩写。

（3）照片可能让雇主对你产生错误的印象，如果对方没有要求，不要寄去。

（4）采用优质白纸，采用效果良好的打印机，如果你给的是复印件，效果要很好。如

果复印效果不理想，不要为了省钱将就着用复印的简历。一般来说，复印纸的质量也会比打印纸的质量差一些。

（5）在简历中要避免把不同纸型、不同纸质、不同颜色的纸张混杂在一起。

（6）如果打印出来后才发现错别字，不要犹豫，重新打印。

（7）最好不要采用简历模板，以免淹没在千篇一律的众多简历之中。

Reading Material

Embedded System

An embedded system is a computer system designed for specific control functions within a larger system, often with real-time[1] computing constraints. It is embedded as part of a complete device often including hardware and mechanical parts. By contrast, a general-purpose computer, such as a personal computer (PC), is designed to be flexible and to meet a wide range of end-user needs. Embedded systems control many devices in common use today.

The microprocessor embedded in this Adidas running shoe calculates the pressure between the runner's foot and the ground five million times per second and continuously changes the cushioning to match an adjustable comfort level.

Embedded systems contain processing cores that are either microcontrollers[2] or digital signal processors (DSP)[3].

A processor is an important unit in the embedded system hardware. It is the heart of the embedded system.

The key characteristic, however, is being dedicated to[4] handle a particular task. Since the embedded system is dedicated to specific tasks, design engineers can optimize it to reduce the size and cost of the product and increase the reliability and performance. Some embedded systems are mass-produced, benefiting from economies of scale[5].

Physically, embedded systems range from portable devices such as digital watches and MP3 players, to large stationary[6] installations like traffic lights, factory controllers, and largely complex systems like hybrid vehicles, MRI[7], and avionics[8]. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a

[1] real-time *adj.* 实时的

[2] microcontroller ['maikrəukən'trəulə] *n.* 微型控制器

[3] digital signal processors (DSP) 数字信号处理器

[4] dedicate to 专注于

[5] economy of scale 规模经济

[6] stationary ['steiʃənəri] *adj.* 固定的

[7] MRI (Magnetic Resonance Imaging) 核磁共振

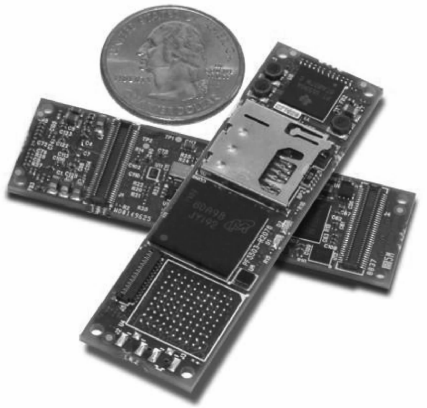
[8] avionics [ˌeivi'ɔniks] *n.* 电子设备

large chassis or enclosure.

1. Variety of embedded systems

Embedded systems are widespread in consumer, industrial, commercial and military applications.

Telecommunications[1] systems employ numerous embedded systems from telephone switches for the network to mobile phones[2] at the end-user. Computer networking uses dedicated routers and network bridges to route data.



Gumstix Overo COM, a tiny, OMAP-based embedded computer-on-module with Wifi and Bluetooth.

Consumer electronics include personal digital assistants (PDAs)[3], mp3 players, mobile phones, videogame consoles[4], digital cameras, DVD players, GPS[5] receivers, and printers. Many household appliances[6], such as microwave ovens, washing machines and dishwashers[7], include embedded systems to provide flexibility, efficiency[8] and features. Advanced HVAC[9] systems use networked thermostats[10] to more accurately and efficiently control temperature that can change by time of day and season. Home automation uses wired and wireless-networking that can be used to control lights, climate, security, audio/visual, surveillance[11], etc., all of which use embedded devices for sensing and controlling.

Transportation systems from flight to automobiles increasingly use embedded systems. New airplanes contain advanced avionics such as inertial guidance systems[12] and GPS receivers that also have considerable safety requirements. Various electric motors—brushless DC motors[13], induction motors[14] and DC motors—use electric/electronic motor controllers. Automobiles, electric vehicles[15], and hybrid vehicles increasingly use embedded systems to maximize efficiency and reduce pollution. Other automotive safety systems include anti-lock braking system (ABS)[16],

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[1] telecommunication ['telikəmju:ni'keiʃən] *n*. 通讯，电信
[2] mobile phone 移动电话
[3] personal digital assistants (PDAs) 个人数字助理
[4] console [kən'səul] *n*. 控制台
[5] GPS (Global Position System) 全球定位系统
[6] household appliance 家用电器
[7] dishwasher ['diʃˌwaʃə] *n*. 洗碗机
[8] efficiency [i'fiʃənsi] *n*. 效率，功效
[9] HVAC (Heating, Ventilation and Air Conditioning) 供热通风与空气调节
[10] thermostat ['θə:məstæt] *n*. 自动调温器，温度调节装置
[11] surveillance [sə:'veiləns] *n*. 监视，监督
[12] inertial guidance system 惯性导引系统
[13] brushless DC motor 无刷直流电动机
[14] induction motor 感应电动机
[15] electric vehicle 电动车辆
[16] anti-lock braking system (ABS) 防抱死制动系统

Electronic Stability Control (ESC/ESP)[1], traction control system (TCS)[2] and automatic four-wheel drive[3].

Medical equipment uses embedded systems for vital signs monitoring, electronic stethoscopes for amplifying sounds, and various medical imaging (PET[4], SPECT[5], CT, MRI) for non-invasive internal inspections. Embedded systems within medical equipment are often powered by industrial computers.

Embedded systems are used in transportation, fire safety, safety and security, medical applications and life critical systems as these systems can be isolated from hacking and thus be more reliable. For fire safety, the systems can be designed to have greater ability to handle higher temperatures and continue to operate. In dealing with security, the embedded systems can be self-sufficient[6] and be able to deal with cut electrical and communication systems.

A new class of miniature wireless devices called motes[7] are quickly gaining popularity as the field of wireless sensor networking rises. Wireless sensor networking, WSN[8], makes use of miniaturization[9] made possible by advanced IC[10] design to couple full wireless subsystems to sophisticated sensors, enabling people and companies to measure a myriad of things in the physical world and act on this information through IT monitoring and control systems. These motes are completely self contained, and will typically run off a battery source for many years before the batteries need to be changed or charged[11].

Embedded Wi-Fi modules provide a simple means of wirelessly enabling any device which communicates via a serial port[12].

2. Characteristics

Embedded systems are designed to do some specific task, rather than be a general-purpose computer for multiple tasks. Some also have real-time performance constraints that must be met, for reasons such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified[13] to reduce costs.

Embedded systems are not always standalone devices. Many embedded systems consist of small, computerized parts within a larger device that serves a more general purpose. For example, the Gibson Robot Guitar features an embedded system for tuning the strings, but the overall purpose

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[1] Electronic Stability Control (ESC/ESP) 电子稳定控制
[2] traction control system (TCS) 牵引控制系统
[3] four-wheel drive 四轮驱动
[4] PET (Position Emission Tomography) 正电子成像技术
[5] SPECT (Single-Photon Emission Computed Tomography) 单光子发射计算机断层扫描
[6] self-sufficient ['selfsə'fiʃənt] *adj.* 自给自足的
[7] mote [məut] *n.* 尘埃，微粒
[8] WSN (Wireless Sensor Network) 无线传感器网络
[9] miniaturization ['miniətʃəraizəʃən] *n.* 小型化
[10] IC (Integrate Circuit) 集成电路
[11] charge [tʃa:dʒ] *n.* 电荷，充电
[12] serial port 串行端口
[13] simplify ['simplifai] *vt.* 单一化，简单化

of the Robot Guitar is, of course, to play music. Similarly, an embedded system in an automobile provides a specific function as a subsystem of the car itself.

The program instructions written for embedded systems are referred to as firmware, and are stored in read-only memory or Flash memory[1] chips. They run with limited computer hardware resources: little memory, small or non-existent keyboard or screen.

2.1 Processors in embedded systems

Embedded processors can be broken into two broad categories. Ordinary microprocessors use separate integrated circuits for memory and peripherals. Microcontrollers have many more peripherals on chip, reducing power consumption[2], size and cost. In contrast to the personal computer market, many different basic CPU architectures are used, since software is custom-developed for an application and is not a commodity product[3] installed by the end user. Both Von Neumann as well as various degrees of Harvard architectures are used. RISC[4] as well as non-RISC processors are found. Word lengths vary from 4-bit to 64-bits and beyond, although the most typical remain 8/16-bit. Most architectures come in a large number of different variants and shapes, many of which are also manufactured by several different companies.

Numerous microcontrollers have been developed for embedded systems use. General-purpose microprocessors are also used in embedded systems, but generally require more support circuitry than microcontrollers.

2.2 ASIC[5] and FPGA[6] solutions

A common array of n configuration for very-high-volume embedded systems is the System on a Chip (SoC)[7] which contains a complete system consisting of multiple processors, multipliers, caches and interfaces on a single chip. SoCs can be implemented as an application-specific integrated circuit (ASIC) or using a field-programmable gate array (FPGA).

2.3 Peripherals

Embedded Systems talk with the outside world via peripherals, such as:

- Serial Communication Interfaces (SCI)[8]: RS-232, RS-422, RS-485 etc;
- Synchronous[9] Serial Communication Interface: I2C[10], SPI[11], SSC and ESSI (Enhanced

[1] Flash memory 闪存
[2] power consumption 能耗，功耗
[3] commodity product 商品
[4] RISC (Reduced Instruction Set Computing) 精简指令集
[5] ASIC (Application-Specific Integrated Circuit) 特定用途集成电路
[6] FPGA (Field-Programmable Gate Array) 现场可编程门阵列
[7] system on a chip (SoC) 集成的系统芯片
[8] Serial Communication Interface (SCI) 串行通信接口
[9] synchronous ['siŋkrənəs] *adj.* 同时的，同步的
[10] I2C (Inter-Integrated Circuit) 内置集成电路
[11] SPI (Serial Peripheral Interface) 串行外部接口

Synchronous Serial Interface);

- Universal Serial Bus (USB);
- Multi Media Cards (SD Cards, Compact Flash etc.);
- Networks: Ethernet, LonWorks[1], etc;
- Fieldbuses: CAN[2]-Bus, LIN[3]-Bus, PROFIBUS[4], etc;
- Timers: PLL[5] (s), Capture/Compare and Time Processing Units;
- Discrete IO: aka General Purpose Input/Output (GPIO);
- Analog to Digital/Digital to Analog (ADC/DAC);
- Debugging: JTAG[6], ISP[7], ICSP[8], BDM[9] Port, BITP[10] and DP [11] ports.

参考译文

个人计算机是如何工作的

当提到“技术”这个词时，大多数人就会想到计算机。实际上，生活中的每一方面都有许多计算机化的成分。家庭中的许多用品（如电视机）都装有微处理器，甚至我们的汽车中也装有计算机。但是大家首先想到的计算机是个人计算机，即 PC。

PC 是围绕微处理器制成的常用工具。它由许多不同部件——内存、硬盘、调制解调器等——共同工作。“常用”意味着你可以使用 PC 做许多事情。你可以用它打印文稿、发送电子邮件、浏览网站和玩游戏。

本文将介绍一般意义上的 PC 及其各种部件。你将了解这些部件以及它们是如何协调工作的。

1. 内部部件

让我们看看典型的桌面计算机的主要部件。

- 中央处理器（CPU）——计算机系统的“大脑”，也被称为“中央处理器”。计算机做的每件事都是由 CPU 管理的。
- 内存——用来保存数据的快速存储设备。因为它直接与中央处理器相连所以运行速度很快。计算机中的内存有以下几种类型：

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[1] LonWorks (local operation network Works) 局部操作网络
[2] CAN (Controller Area Network) 控制器区域网络
[3] LIN (Local Interconnect Network) 本地互联网络
[4] PROFIBUS (Process Field Bus) 过程现场总线
[5] PLL (Phase Lock Loop) 锁相回路，锁相环
[6] JTAG (Joint Test Action Group) 联合测试行动小组
[7] ISP (In-System Programming) 在系统编程
[8] ICSP (In Circuit Serial Programming) 在线串行编程
[9] BDM (Background Debug Mode) 背景调试模式
[10] BITP (Biotech Industrial Training Program) 生物技术工业训练编程
[11] DP (Display Port) 显示接口

⊙ 随机存储器（RAM）——用来临时存储计算机当前工作中的信息。
⊙ 只读存储器（ROM）——永久存储的存储器，计算机用来存储不改变的重要数据。
⊙ 基本输入/输出系统（BIOS）—— 一种 ROM，计算机用来建立首次开机时的基本通信。
⊙高速缓冲存储器 —— 把频繁使用的数据存储到直接与 CPU 连接的速度极快的 RAM 中。
⊙虚拟内存 —— 硬盘上的空间，用来临时存储数据，当需要时与 RAM 交换数据。

- 主板 —— 主要的电路板，其他所有内部部件都与其连接。CPU 和内存通常安装在主板上。其他系统可以直接安装在主板上或者通过附件连接到主板上。例如，声卡可以直接内置在主板上，也可以通过 PCI 连接到主板上。
- 电源 —— 一个电子变压器，调节计算机所用的电压。
- 硬盘 —— 这是大容量持久存储设备，用来保存像程序和文档这样的信息。
- 操作系统 —— 这是基础软件，是用户与计算机之间的接口。
- 电子集成驱动器（IDE）—— 这是用于硬盘、CD-ROM 和软盘驱动器的主要接口。
- 外部设备互连（PCI）总线 —— 连接计算机外设的最常用的通道。PCI 使用一系列位于主板上的 PCI 卡插槽。
- 小型计算机系统接口（SCSI）—— 音同“skuzzy”，这个小型计算机系统接口用于给计算机添加外围设备，如硬盘或扫描仪。
- 加速图形接口（AGP）—— AGP 是非常高速的连接接口，用于计算机和图形卡建立连接。
- 声卡 —— 用于记录和播放音频，计算机用它来把模拟音频信号转换为数字音频信号，也可以把数字音频信号再转换为模拟音频信号。
- 图形卡 —— 用来将计算机的图像数据转换为显示器可显示的格式。

2. 连接

2.1 输入/输出

无论计算机中的部件功能多么强大，都需要一种与它们交互的途径。这种交互途径称为输入/输出（I/O）。PC 中最常用的 I/O 类型有：

- 显示器 —— 显示器是用来显示计算机中信息的主要设备。
- 键盘 —— 键盘是把信息输入到计算机中的主要设备。
- 鼠标 —— 鼠标是用于浏览和与计算机交互的主要设备。
- 可移动存储设备 —— 可移动存储设备非常容易地向本地计算机中加入新的信息，也可以保存要带到其他地方的信息。
  ⊙ 软盘 —— 移动存储最常用的形式，软盘非常便宜而且方便保存信息。
  ⊙ 只读光盘（CD-ROM）—— CD-ROM 是商业软件发布最流行的形式。许多系统现在都提供 CD-R（可记录）和 CD-RW（可改写）设备，CD-RW 也可以记录。
  ⊙ 闪存 —— 基于电可擦除只读存储器（EEPROM）的一种 ROM。闪存提供快速的、可持久的存储。CompactFlash、SmartMedia 和 PCMCIA 都属于闪存。

⊙ 数字视频只读光盘（DVD-ROM）——DVD-ROM 与 CD-ROM 类似，但能存储更多的信息。

2.2 接口

- 并行接口——它通常用于连接打印机。
- 串行接口——它总是用来连接外置调制解调器。
- 通用串行总线（USB）——迅速成为最流行的外部连接设备，USB 接口供电且功能多样，并非常易于使用。
- 火线（IEEE 1394）——火线是把数字视频设备连接到计算机的一种非常流行的方法，例如便携式摄像录音一体机、数码相机等。

2.3 因特网/网络

- 调制解调器——这是连接到因特网的标准方法。
- 局域网（LAN）卡——这被许多计算机使用，特别是在一个以太办公网络中，用来互相连接。
- 线缆调制解调器——有些人使用家中的有线电视系统连接到因特网。
- 数字用户线（DSL）调制解调器——用于快速连接标准电话线。
- 超高速数字用户线（VDSL）调制解调器——DSL 较新的变种，VDSL 要求用户的电话线使用光缆。

3. 从开机到关机

3.1 基本输入/输出系统（BIOS）

既然已经熟悉了 PC 中的部件，就让我们看看在一个典型的计算机运行期间（从打开电源到关机）发生了什么。

A. 按下计算机和显示器上的“On”按钮。

B. BIOS 软件进行“开机自检”（POST）。对许多计算机来说，BIOS 显示文本信息，这些信息描述如计算机中安装内存的数量和硬盘类型这样的数据。在这个引导期中，BIOS 做许多重要的工作为计算机运行做好准备。

- BIOS 测定显卡是否可以使用。大多数显卡有自己的小 BIOS 来初始化显卡上的内存和处理器。如果显卡没有自己的 BIOS，那么 BIOS 可以装入主板上的另一个 ROM 中的显卡驱动信息。
- BIOS 检查是冷启动还是重新启动。通过查看内存地址 0000:0472 的值来做到这一点。值是 1234h 表明是重新启动。在这种情况下，BIOS 就跳过剩余的 POST。其他的值就表明是冷启动。
- 如果是冷启动，BIOS 通过对内存每一地址的读/写来校验 RAM。它检查键盘和鼠标，并且查找 PCI 总线，如果找到，就检查全部的 PCI 卡。如果在 POST 期间，BIOS 发现错误，就会发出一系列蜂鸣声或在屏幕上显示文本信息。这时出现的所有错误几乎都是硬件故障。

- BIOS 显示系统的一些详细信息。一般包括关于以下部件的信息：
  - ⊙ 处理器；
  - ⊙ 软盘和硬盘驱动器；
  - ⊙ 存储器；
  - ⊙ BIOS 版本和日期；
  - ⊙ 显示器。
- 任何特别的驱动程序，如用于 SCSI 适配器的驱动程序，都是从适配器装入的，BIOS 显示该信息。

BIOS 把指定的存储设备序列看作 CMOS Setup 中的引导设备。“Boot”是“bootstrap”的缩写，如老话所说的“自我提升”。引导指启动操作系统的过程。BIOS 试着从使用引导装入程序的第一个设备来启动引导序列。

C. 引导装入程序把操作系统装入内存并开始运行它。通过建立保存操作系统、用户信息和应用程序的分区来做到这一点。然后，引导装入程序建立用于在该计算机的子系统内及子系统间通信的数据结构。最后，由操作系统控制计算机的运行。

3.2 操作系统

一旦装入，操作系统的任务就可分成以下六大类：

- 处理器管理——把任务分解为可管理的块，并在发送到 CPU 之前排序。
- 内存管理——整理写入或读出 RAM 的数据流，并决定何时需要虚拟内存。
- 设备管理——提供连接到计算机、CPU 和应用程序的每个设备之间的接口。
- 存储管理——引导数据永久性地存储到硬盘或其他存储设备上。
- 应用接口——提供软件程序和计算机间标准的通信和数据交换。
- 用户界面——提供用户与计算机通信和相互作用的途径。

用户可以打开字处理程序并输入一封信，保存它，然后把它打印出来。要完成这一工作，需要以下几个部件协同工作：

- 键盘和鼠标把用户的输入发送给操作系统。
- 操作系统确定字处理程序已激活，并把用户的输入作为程序数据。
- 字处理程序确定所用的数据格式，并通过操作系统临时存储在 RAM 中。
- 来自字处理程序的每个指令都通过操作系统发送给 CPU。在发送到 CPU 之前，这些指令与受操作系统监控的其他程序的指令交织在一起。
- 这时，操作系统有规律地给图形卡提供显示信息，引导它们显示在显示器上。
- 当要保存这封信时，字处理程序发送一个请求给操作系统。然后出现一个标准窗口，用于选择保存和调用信息的地址和名称。一旦选择了文件名称和路径后，操作系统就把 RAM 中的数据引导到合适的存储设备中。
- 单击“Print”按键。字处理程序发送一个请求给操作系统，操作系统把数据转换为打印机可以理解的格式，并把 RAM 中的数据引导到所请求的打印机的适当端口。

打开一个网络浏览器并查看“HowStuffWorks”网站。操作系统再次调整它的全部行为。这时计算机就可以接收来自其他源的输入，如来自因特网的，或来自用户的。操作系统将无

缝地整合全部的输入/输出信息。

- 关闭网络浏览器并选择“Shut Down”选项。
- 操作系统将关闭当前活动的全部程序。如果一个程序有未保存的信息，在关闭该程序之前会得到一个保存它的提示。
- 操作系统将把当前的设置写到一个特殊的配置文件中，以便下次启动时使用相同的设置。

如果计算机提供了电源的软件控制，则操作系统在完成自己的关机操作过程后，会完全地关闭计算机。否则，需要手动关闭电源。