A-LEVEL COMPUTER SCIENCE • HOLIDAY HOMEWORK 假期作业

5 System Software – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
operating system	操作系统			
process	进程			
virtual memory	虚拟内存			
device driver	设备驱动			
utility program	实用程序			
translator	翻译器			
compiler	编译器			
interpreter	解释器			
assembler	汇编器			

Recall

At IGCSE you used computers every day. Bring this with you:

- The operating system is the main software that runs the machine.
- You ran programs (applications) on top of it.

At AS we list what the operating system does, and meet the programs that translate code — the software that makes all other software possible.

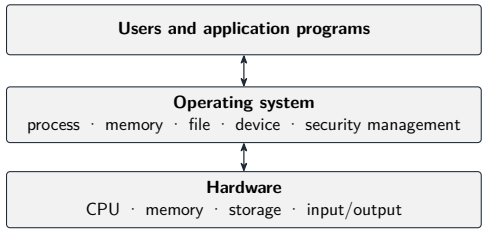
New ideas

Read these first. Each idea has a short worked example. Then do the Practice.

1 The operating system

The **operating system** 操作系统 manages the computer's hardware and software so that programs can run. Its jobs include:

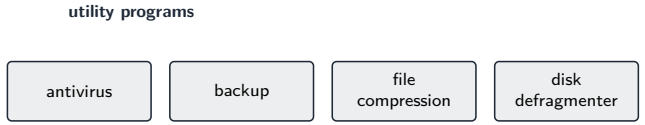
- managing each running program (a **process** 进程);
- managing memory, including **virtual memory** 虚拟内存 (using disk space as extra RAM when memory is full);
- talking to each piece of hardware through a **device driver** 设备驱动.



Worked example. When you open a photo editor, the OS gives it memory, loads it from disk, and lets it use the screen and mouse through device drivers — the program never has to know the hardware details itself.

2 Utility programs

A **utility program** 实用程序 is a small tool that keeps the system healthy — antivirus, backup and file compression are common examples.

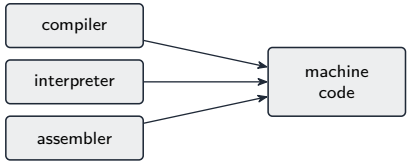


Worked example. A backup utility copies your files to another disk on a schedule, so a crash or theft does not lose your work.

3 Translators

Code you write must be turned into machine code by a **translator** 翻译器:

- a **compiler** 编译器 translates the whole program at once, then it can run on its own;
- an **interpreter** 解释器 translates and runs one line at a time;
- an **assembler** 汇编器 turns assembly language into machine code.



Worked example. Python usually uses an interpreter (runs line by line, easy to test as you go); C uses a compiler (translated once into a fast program that runs on its own).

Watch out: an interpreter does *not* leave behind a machine-code file you can keep — it translates the code again every time the program runs.

Practice

5.1 Give one example of a utility program. [1]

5.2 State what an assembler translates, and into what. [1]

5.3 State two jobs done by the operating system. [2]

5.4 Explain what virtual memory is. [2]

5.5 State one difference between a compiler and an interpreter. [2]

5.6 Explain one advantage of using an interpreter while you are still writing and testing a program. [2]

5.7 Challenge. A finished program will be sent to customers who must not see the source code and who want it to run fast. Would you give them a compiled or an interpreted version? Give a reason. [2]