

GCSE Computer Science

Topic 1.7 System Software (1)

A computer system is a combination of hardware and software that work together to process data.

Hardware is physical components that make up a computer system. **Internal hardware** is inside the case. **Peripheral hardware** is external to the case and connected to the computer.

Software is programs or applications that run on a computer.

APPLICATION SOFTWARE : software that is designed to assist the user to complete specific tasks.

SYSTEM SOFTWARE : software designed to run and maintain a computer system.

Operating System
A piece of software responsible for running the computer, managing hardware, applications, users and resources.

Utility Software
Software designed to help maintain / optimise a computer system.



5 main jobs:

1. Peripheral management
2. Provides a user interface
3. Memory management & multi-tasking
4. User management
5. File management

1

Computer systems use peripheral devices to input and output data.

- All peripherals are controlled by the operating system using programs called device drivers.
- The drivers carry out translations to allow the OS and the peripherals to communicate correctly.

2

The operating system provides a user-interface.

- The user interface is the way that the user interacts/ communicates with the computer.
- GUI / CLI are the two most common user interfaces.



4

On shared and networked computers, the OS manages users.

- User names and passwords are used to allocate permissions for access to files and folders.

This is used to prevent open access to all data and areas of the computer system.



5

The OS creates a folder and file structure for data. This makes it easier for users to organise and find data.

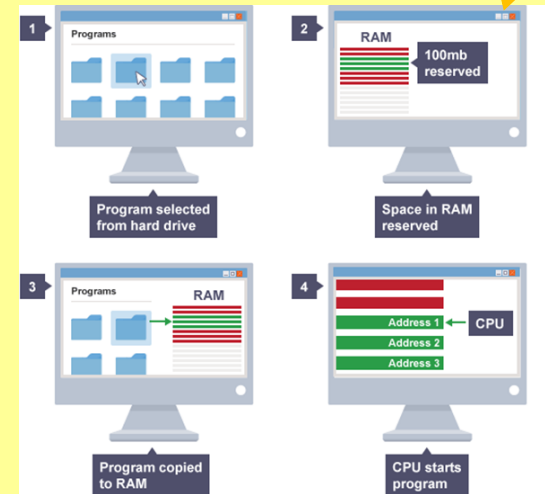
- On networks and shared computers, file permissions are used.
- File permissions controls who can see/open a file, edit or delete a file.



3

When you open a program, the OS has to find the program files on the hard-disk drive, move them into main memory (RAM), and instruct the CPU to start executing the program from the beginning.

- The OS checks there is enough room in RAM, if not it will make room by moving some data to virtual memory.
- The OS also makes it possible to run several programs at once (multitasking).
- Several programs can be stored in RAM at the same time, however only one program at a time is processed by the CPU.
- The CPU allocates each process a CPU time-slot so that all the programs can be processed in turn.



An operating system usually comes with some security utility features:

- Anti-virus software - detects and blocks viruses.
- Firewall - examines all data entering and leaving the network and block any potential threats.



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What I need to know:

- Define 'computer system'.
- Define 'hardware'.
- Define 'software'.
- Define 'application software'.
- Define 'system software'.
- Define 'operating system'.
- Define 'utility software'.
- List the 5 main jobs of an operating system.
- Describe what the OS does to manage peripheral devices.
- Describe what is meant by a user interface.
- State the two main types of user interface.
- Describe how the OS manages memory and multi-tasking.
- Describe how the OS manages users on shared/network computers.
- Describe how the OS manages files.
- State which two security utility programs are often included with the OS.
- Describe the function of anti-virus software.
- Describe the function of firewall software.

Find the names of **five** operating systems below.

E	M	J	R	C	O	D	E	R	D	A	I	K	Y	S	E
F	L	E	G	I	M	R	B	N	Z	B	O	V	I	A	U
W	I	F	M	E	A	N	D	R	O	I	D	A	O	L	M
A	N	T	B	Q	C	C	E	R	I	H	T	I	S	R	T
R	U	S	E	H	O	D	W	I	N	D	O	W	S	D	S
D	X	F	U	H	S	D	G	T	B	N	I	R	T	Z	B

After the new OS was installed, it automatically downloaded and installed the device drivers.
 b) Describe what is meant by device drivers.

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[2]

Josephine's computer has a multi-tasking operating system. Explain how the operating system manages memory and CPU time to allow the computer to multi-task.

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[Total 6 marks]

Selina has customised the graphical user interface (GUI) on her computer's operating system.
 a) Describe the purpose of a graphical user interface.

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[2]

Identify **two** features the operating system may provide to help protect David's personal data.

1

2

[2]

David has just installed a new operating system on his computer.

a) State **three** functions of an operating system.

1

2

3

[3]