**The purpose of an Operating System**

An Operating System (OS) is software that gives humans a way to interact with a computer, and allows software to interact with hardware. It manages resources and allocates them to programs.

Before OS’s, computers simply ran a set of instructions entered by hand – first in the form of switches and jumper cables, and later hole-punched cards. Anyone wishing to run a program was allocated a date and time to come to the computer and program in their instructions, and then the computer was left to run the code until it completed or crashed.

In 1962, the first OS, Atlas Supervisor, was created. It allowed multiple programs to be executed concurrently on Manchester University’s Atlas computer, managed resources between the programs and even had virtual memory.

OS’s gradually got more complex, eventually becoming the standard way for a program to interact with hardware.

Modern OS’s, such as Windows, GNU/Linux and OS X have many more features than just running programs and managing resources.

Multi-tasking is only possible because of OS’s – they switch between processes so that they appear to run concurrently. The OS will either prioritize processes the user is running, or allocate time on the CPU according to a pre-calculated schedule – rather like old computers before OS’s. This is often done with massively parallel computing.

OS’s are responsible for controlling hardware – for example, if a step in a program is to display something onscreen, it ‘tells’ the OS what to draw and the OS handles sending the information to the screen.  
They do this through drivers – pieces of low-level software specific to a piece of hardware, such as a video card, that enable the OS to interact with it.

OS’s manage memory – they allocate ‘blocks’ of RAM to each process, so that a process cannot interfere with another process.

They also handle virtual memory, so that when a process requests data in RAM that has been moved to a page file, the OS will retrieve it for the process.

The Operating System manages the file system – it prevents unauthorised programs and users from editing or viewing files, and they also write to and read from the hard drive.

On a similar note, the OS manages account security – they prevent a user from accessing any other user’s files (unless they are the administrator, of course).

On a much simpler level, it is only because of the OS that it is possible to have multiple accounts at all.

OS’s are not just used on PC’s – phones also have them. Android is based on the Linux kernel, and iOS uses the Unix kernel. Even older ‘dumb’ phones have OS’s – Nokia used the Symbian OS for years before switching to Windows 8 for phone.

In short, OS’s are a way to manage files and allow software to interact with hardware.