



1.2.1 Operating Systems

The Role of Operating Systems

An operating system is a set of programs that **manages the operation of a computer**.

Functions of an operating system:

Provide a user interface

- Users interact with the operating system rather than directly with the hardware.
- The operating system provides interfaces such as a graphical user interface (GUI) or command-line interface (CLI).

Memory management

- It is responsible for loading programs into and out of RAM.
- The operating system tracks which memory locations are currently in use and which are free.
- It allocates memory to programs and manages techniques such as paging, segmentation and virtual memory to make efficient use of memory.

Processor scheduling

- The operating system allocates processor time to running programs and handles interrupts by loading the appropriate interrupt service routines (ISRs).

Manage inputs and outputs

- The operating system manages communication with input and output devices using device drivers.
- Device drivers allow the operating system to communicate with specific hardware devices.

Security

- The operating system manages user accounts, authentication and file permissions to help prevent unauthorised access to data and resources.
- Different users can have different settings and permissions when they log onto the same computer.





Provide a platform to run other software

- The operating system provides a platform on which application software can run. It manages access to hardware and system resources so that applications can operate correctly.

Provide utilities for system maintenance

- The operating system provides utilities for maintaining and managing the computer system, such as file management, disk management and system monitoring tools.

