



## 4.6.1 Hardware & Software

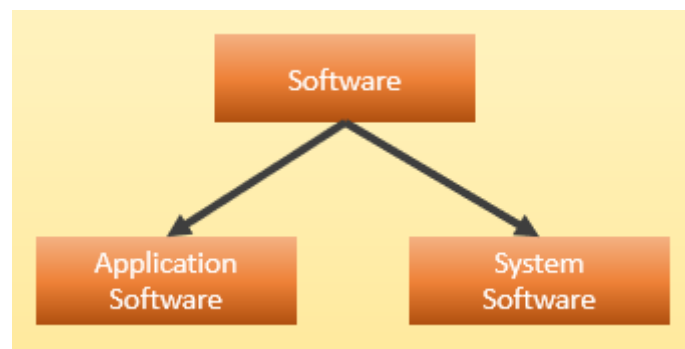
### Hardware and Software

The computer is made up of hardware and software.

**Hardware** is the physical components of the computer which provide a platform to run software.

**Software** is the program code that runs on hardware.

Software can be defined as either application software or system software.



### Application software

Programs that complete a specific task for the user of the computer.

E.g. Word processors, browsers, spreadsheet software.

### System software

Programs that operate, control and maintain the computer and its components.

E.g. Operating systems, utility programs, library programs, translators.





## Operating Systems

The operating system is a core system software that manages the hardware and provides services to programs and users. It provides an interface between the user and the hardware, hiding the complexity of the hardware from the user.

Some of the many functions of the operating system are:

### Memory management

- Allocating memory to programs
- Recording which memory spaces are being used and which are free.

### Processor scheduling

- Allocating processor time to the multiple programs running at any one time on a computer.
- Ensures each program gets an appropriate amount of processor time.

### File system management

- Organises the storage and retrieval of files on storage devices.

### Handling interrupts

- Handles signals from hardware or software that need the attention of the processor.

### System security

- Protects data and resources from unauthorized access
- Manages user account, passwords and permissions.

### Device Management

- Acts as a bridge between hardware devices and software.
- Uses device drivers to standardize hardware communication.





## Other System Software

### Utility programs

Utility programs are used in the general upkeep of a computer system.

Examples:

- Data backup programs
- Disk defragmenters
- Disk clean-up programs
- Compression programs
- Encryption programs
- Antivirus programs
- File managers

### Library programs

Library programs are programs that contain useful, frequently used functions.

#### Advantages of using libraries:

- Programmers can make use of libraries when developing a program to simplify the process and save time having to rewrite algorithms over and over.
- The code has already been tested, reducing the need for programmers to debug it themselves
- Programmers can make use of other programmers' expertise.

Examples of library programs:

- Math libraries
- Random libraries
- Database libraries
- GUI libraries

### Translators

Translators are programs that convert high-level (or low-level) languages into low level machine code so that they can be executed by the processor.

Examples:

- Assemblers
- Compilers
- Interpreters

*Explained further in 4.6.3 Types of Translators.*

