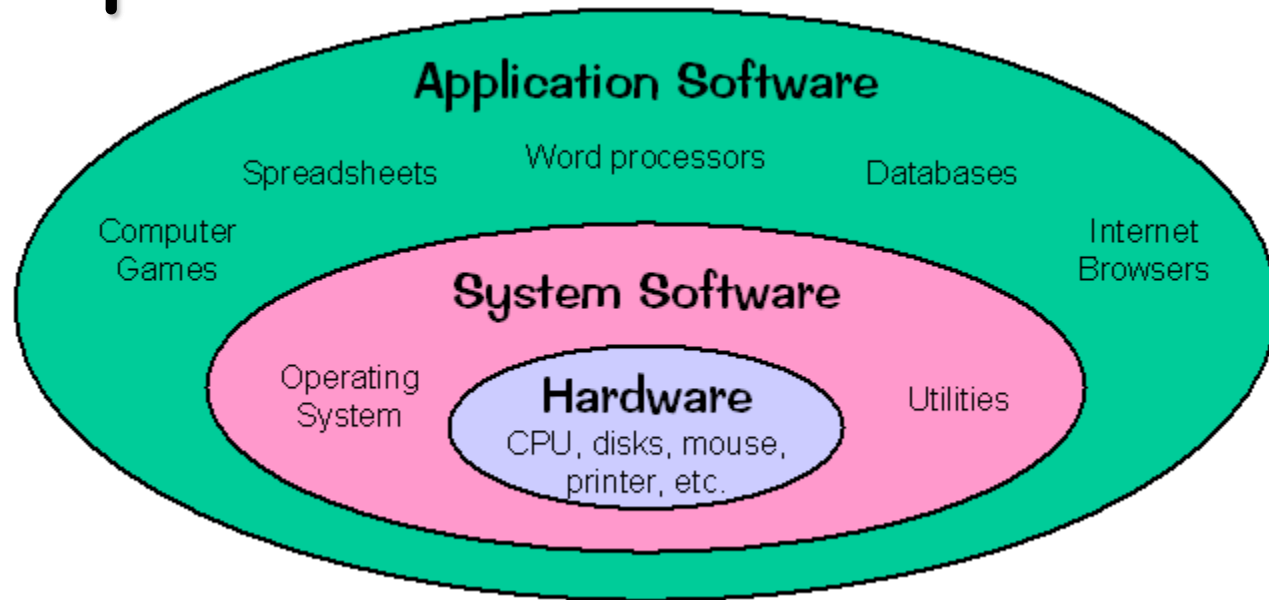


Computer Software



Computer software

Software consists of programs and enables a computer to perform specific tasks, as opposed to its physical components (hardware) which can only do the tasks they are mechanically designed for.

It is loaded into a computer's storage (such as a hard drive, a memory, or RAM). Once the software is loaded, the computer is able to execute the software in the Central Processing Unit (CPU).

Computer software

This involves passing instructions from the application software, through the system software, to the hardware which ultimately receives the instruction as a machine code. Each instruction causes the computer to carry out an operation - to move data, carry out a computation, or alter the control flow of instructions.

Software & Hardware?

- ◎ Computer Instructions or data, anything that can be stored electronically is **Software**.
- ◎ Hardware is one that is tangible. The storage devices (Hard disk, CD's etc.), mouse, keyboard CPU and display devices (Monitor) are **Hardware**.

Key Concepts

- Software licensing

Protection by software vendors to prevent unauthorized use. Also prevents others from duplicating the software.

- Software upgrades

A revised version of software that usually includes fixes of known problems, plus enhancements to existing capabilities

- Global software support

Software that is distributed around the globe may require unique support mechanisms due to local political and economic conditions

Key concepts

- Open Source Software:

Refer to free software that are readily available for use and modify under the General public license

- Proprietary Software:

They are software that are not free for use and modification. The developers of such software require users to purchase the software.

- Copyright

This refers to intellectual property that protects the software developer from having his/her software duplicated or used by another person without authorization

Computer software

- Data is typically moved from one place in the memory to another. Sometimes it involves moving data between memory and registers which enables high-speed data access in the CPU.
- Instructions may be performed sequentially, conditionally, or iteratively.

Sequential instructions

- Sequential instructions are those operations that are performed one after another.

Conditional instructions

- They are performed in such a way that different sets of instructions are executed depending on the value(s) of some data. In some languages this is known as an "if statement".

Iterative instructions

- They are performed repetitively and may depend on some data value. This is sometimes called a "loop." Often, one instruction may "call" another set of instructions that are defined in some other program or module. When more than one computer processor is used, instructions may be executed simultaneously.

Types of Software

System Software

Programming software

Application Software

Open source software (OSS)

Proprietary software

System Software:

It includes the Operating System and all the utilities that enable the computer to function.

It refers to any computer software which manages and controls the hardware so that application software can perform a task.

Example: Operating Systems, Compiler, Loader, Linker, Interpreter.

Operating System:

- ◎ Operating System is a software, which makes a computer to actually work.
- ◎ It is the software that enables all the programs we use.
- ◎ The OS organizes and controls the hardware.
- ◎ OS acts as an interface between the application programs and the machine hardware.
- ◎ Examples: Windows, Linux, Unix and Mac OS, etc.,

Compiler:

It is a program that reads a program in one language - the source language and translates into an equivalent program in another language - the target language.

Source Languages	Target Languages
'C' language	Machine language
'Pascal' language	Machine language
FORTRAN language	Machine language
C++ language	
ADA language	

Loader:

It is the part of an operating system that is responsible for loading programs into memory, preparing them for execution and then executing them.

The loader is usually a part of the operating system's kernel and usually is loaded at system boot time and stays in memory until the system is rebooted, shut down, or powered off.

In Unix, the loader is the handler for the system call **execve()**.

Linker:

A **linker** or **link editor** is a program that takes one or more objects generated by compilers and assembles them into a single executable program.

Linkers can take objects from a collection called a *library*. The objects are program modules containing machine code and information for the linker.

The linker takes care of arranging the objects in a program's address space.

Interpreter:

It is a computer program that translates and executes instructions written in a computer programming language line-by-line, unit by unit etc.,

An interpreter needs to be able to analyze instructions written in the source language.

Example: Lisp systems, etc.,

Application Software:

Application Software includes programs that do real work for a user.

Example:

Payroll systems, Inventory Control, Word Processor, Spreadsheet and Database Management System etc.,

Word Processors:

It is a tool that helps user in creating, editing, and printing documents. Word processors will normally have the following capabilities built into them:

- Spell checking
- Standard layouts for normal documents
- Some characters appearing in bold print, italics, or underlined
- Center lines, make text line up on the left side of the paper, or the right side of the paper
- Save the document so it can be used again
- Print the document.

Examples: WordPerfect and Microsoft Word

Spreadsheets:

The spreadsheet packages are designed to use numbers and formulas to do calculations with ease. Examples of spreadsheets include:

- » Budgets
- » Payrolls
- » Grade Calculations
- » Address Lists

The most commonly used spreadsheet programs are Microsoft Excel and Lotus 123.

Graphic Presentations:

The presentation programs can make giving presentations easier. Other uses include:

- » Slide Shows
- » Repeating Computer Presentations on a computer monitor
- » Using Sound and animation in slide shows

The most recognized graphic presentation programs are Microsoft PowerPoint and Harvard Graphics.

Database Management System(DBMS):

- ◎ A DBMS is a software tool that allows multiple users to store, access, and process data into useful information.
- ◎ Database programs are designed for these types of applications:
 - Membership lists
 - Student lists
 - Grade reports
 - Instructor schedules

All of these have to be maintained so you can find what you need quickly and accurately.
- ◎ Example: Microsoft Access, dBASE, Oracle.

Open Source Software:

- **Open source software (OSS)** is computer software whose source code is available under a license that permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form.
- It is often developed in a public, collaborative manner.

Well-known OSS products are Linux, Netscape/Firefox, Apache , etc.,

Proprietary Software:

- **Proprietary software** (also called **non-free software**) is software with restrictions on using, copying and modifying as enforced by the proprietor. Restriction on use, modification and copying is achieved by either legal or technical means and sometimes both.
- Proponents of proprietary software are Microsoft.
- Examples: AutoCAD, Norton Antivirus etc.,

- ***Unlike*** software, computer hardware encompasses the physical interconnections and devices required to store and execute (or run) the software.

Assignment

1. Discuss Contribution of application software in Business
2. Discuss the types of operating systems