

ADVANCED COMPUTER NETWORK

ASSIGNMENT

Topic: *Computer Hardware and Various Operating System*

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Computer Hardware and Software

Computer hardware is a collective term used to describe any of the physical components of an analog or digital computer. The term hardware distinguishes the tangible aspects of a computing device from software, which consists of written instruction that tell physical components what to do.

Computer hardware can be categorized as having either internal or external components. Internal components include motherboard, hard drive, chips, transistors, CPU, RAM, GPU, network interface card and Universal serial bus. External components, also called peripheral components, microphones, monitors, speakers are the examples of output computer hardware. The part which activates the physical components called Software and responsible for directing the work to the hardware.

Application Software

Application software is a computer program designed to perform a group of coordinated task or functions for an end-user.

System Software

System software is a set of programs to administer the system resources. It also serves as a kind of platform for running the application software. Operating system is defined as a system software that manages computer hardware and software resources .

Hardware

Computer hardware is the collection of physical elements that constitutes a computer system. Computer hardware refers to the physical parts or components of a computer such as the monitor, mouse, keyboard, computer data storage, hard drive disk (HDD), system unit (graphic cards, sound cards, memory, motherboard and chips), etc. all of which are physical objects that can be touched.

Input Devices

Input device is any peripheral (piece of computer hardware equipment to provide data and control signals to an information processing system such as a computer or other information appliance. Input device Translate data from form that humans understand to one that the computer can work with. Most common are keyboard and mouse.

Following are some of the important input devices which are used in a computer –

- Keyboard
- Mouse
- Joy Stick
- Light pen
- Track Ball
- Scanner
- Graphic Tablet
- Microphone
- Magnetic Ink Card Reader(MICR)
- Optical Character Reader(OCR)
- Bar Code Reader
- Optical Mark Reader(OMR)

Keyboard

Keyboard is the most common and very popular input device which helps to input data to the computer. The layout of the keyboard is like that of traditional typewriter, although there are some additional keys provided for performing additional functions. Keyboards are of two sizes 84 keys or 101/102 keys, but now keyboards with 104 keys or 108 keys are also available for Windows and Internet.

Mouse

Mouse is the most popular pointing device. It is a very famous cursor-control device having a small palm size box with a round ball at its base, which senses the movement of the mouse and sends corresponding signals to the CPU when the mouse buttons are pressed. Generally, it has two buttons called the left and the right button and a wheel is present between the buttons. A mouse can be used to control the position of the cursor on the screen, but it cannot be used to enter text into the computer.

Scanner

Scanner is an input device, which works more like a photocopy machine. It is used when some information is available on paper and it is to be transferred to the hard disk of the computer for further manipulation.

Microphone

Microphone is an input device to input sound that is then stored in a digital form.

Central Processing Unit (CPU)

A CPU is the brain of a computer. It is responsible for all functions and processes. Regarding computing power, the CPU is the most important element of a computer system. The CPU is comprised of three main parts : * Arithmetic Logic Unit (ALU): Executes all arithmetic and logical operations. Arithmetic calculations like addition, subtraction,

multiplication and division. Logical operation like compare numbers, letters, or special characters * Control Unit (CU): controls and coordinates computer components. 1. Read the code for the next instruction to be executed. 2. Increment the program counter so it points to the next instruction. 3. Read whatever data the instruction requires from cells in memory. 4. Provide the necessary data to an ALU or register. 5. If the instruction requires an ALU or specialized hardware to complete, instruct the hardware to perform the requested operation. * Registers :Stores the data that is to be executed next, "very fast storage area".

Primary Memory:-

1. RAM: Random Access Memory (RAM) is a memory scheme within the computer system responsible for storing data on a temporary basis, so that it can be promptly accessed by the processor as and when needed. It is volatile in nature, which means that data will be erased once supply to the storage device is turned off. RAM stores data randomly and the processor accesses these data randomly from the RAM storage. RAM is considered "random access" because you can access any memory cell directly if you know the row and column that intersect at that cell.

2. ROM (Read Only Memory): ROM is a permanent form of storage. ROM stays active regardless of whether power supply to it is turned on or off. ROM devices do not allow data stored on them to be modified.

Secondary Memory:- Stores data and programs permanently :its retained after the power is turned off**1. Hard drive** (HD): A hard disk is part of a unit, often called a "disk drive," "hard drive," or "hard disk drive," that store and provides relatively quick access to large amounts of data on an electromagnetically charged surface or set of surfaces.

2. Optical Disk: an optical disc drive (ODD) is a disk drive that uses laser light as part of the process of reading or writing data to or from optical discs. Some drives can only read from discs, but recent drives are commonly both readers and recorders, also called burners or writers. Compact discs, DVDs, and Blu-ray discs are common types of optical media which can be read and recorded by such drives. Optical drive is the generic name; drives are usually described as "CD" "DVD", or "Bluray", followed by "drive", "writer", etc. There are three main types of optical media: CD, DVD, and Blu-ray disc. CDs can store up to 700 megabytes (MB) of data and DVDs can store up to 8.4 GB of data. Blu-ray discs, which are the newest type of optical media, can store up to 50 GB of data. This storage capacity is a clear advantage over the floppy disk storage media (a magnetic media), which only has a capacity of 1.44 MB.

3. Flash Disk A storage module made of flash memory chips. Flash disks have no mechanical platters or access arms, but the term "disk" is used because the data are accessed as if they were on a hard drive. The disk storage structure is emulated.

Operating System

An Operating System (OS) is a software that acts as an interface between computer hardware components and the user. OS is the program that, after being initially loaded into the computer by a boot program, manages all of the other application programs in a computer. The functions of an OS include:

- **Memory Management:-** Memory management module Performs the task of allocation and de-allocation of memory space to programs in need of this resources.
- **Security:-** Security module protects the data and information of a computer system against malware threat and unauthorized access.
- **Command interpretation:-** This module is interpreting commands given by the and acting system resources to process that commands.
- **Bootting:-** Bootting is the process of turning on the computer and powering off the system.
- **I/O System Management:-** One of the main objects of any OS is to hide the peculiarities of that hardware devices from the user.
- **Secondary-Storage Management:-** Systems have several levels of storage which includes primary storage, secondary storage and cache storage. can Instructions and data must be stored in primary storage or cache so that a running program reference it.

Types of an OS include:

- **Multitasking/Time sharing OS**

Time-sharing operating system enables people located at a different terminal to use a single computer system at the same time.

- **Network OS**

Network OS runs on a server. It provides the capability to serve to manage data, security and networking functions.

- **Distributed OS**

Distributed systems use many processors located in different machines to provide very fast computation .

The Five Most Popular Operating Systems

There are five examples of operating systems. These are likely what run your phone, computer or other devices.

1. Windows OS

The Windows OS has been around since the 1980s and has had several versions and updates (including Windows 95, Windows Vista, Windows 7/8/10, etc.) Microsoft Windows is one of the popular operating system types and is preloaded on most new PC hardware. With each new Windows update or release, Microsoft continues to work on improving their users' experience, hardware, and software, making Windows more accessible and easier to use. Microsoft Windows contains a control panel, a desktop and desktop assistant, disk cleanup, event viewer, and more. Many users prefer Microsoft Windows because they say it's compatible with many other kinds of software. Many kinds of computer programs run best on Microsoft Windows because they're developed by Microsoft.

2. Linux OS

Linux is different from Windows and Apple in that it's not a proprietary software, but rather a family of open source systems. In other words, anyone can modify and distribute it. Linux may be the least known on this list, but it's free and available in many different open source versions. Linux is popular because of its ease of customization and offers a variety of options to those who understand how to use it. If you know how to customize and work with operating systems, Linux is an ideal choice. And if this kind of coding and back-end work is interesting to you, it may be a good idea to purchase a Linux system and get started on manipulating it.

3. Apple macOS

Head-to-head in the competition with Microsoft Windows is Apple macOS. macOS and Windows are both examples of proprietary operating system, meaning that the company conceptualized, designed, developed and now sells their own OS.

4. Apple iOS

Apple's iOS is another mobile operating system used exclusively for iPhone, some of the most popular mobile devices on the market. iOS integration have regular updates, new expansions to software, and continually are offering new features for users even if they have older devices. Many users appreciate the unique user interface with touch gestures, and the ease of use that iOS offers. This operating system also allows other Apple devices to connect, giving users easy connections to other devices or people.

5. Android Mobile OS

The OS that companies including Google use to run its Android mobile smartphones and tablets is based on Linux distribution and other open source software. Android OS is the primary OS for Google mobile devices like smartphones and tablets. Android has gained increasing popularity since its release as an alternative to Apple's iOS for smartphone users and is continuing to increase in popularity with new updates and exciting features.

- **MS-DOS**

MS-DOS which is short for Microsoft Disk Operating System is a non-graphical command line operating system developed for IBM compatible computers with x86 microprocessor.

- **Solaris OS**

Solaris or SunOS is the name of the Sun company's Unix variant operating system that was originally developed for its family of SPARC as well as for Intel based processors. The UNIX workstation market had been largely dominated by this OS during its time. Oracle purchased Sun and later renamed to Oracle Solaris.