Experiment No - 1

Introduction to Operating System -

An operating system acts as an intermediary between the user of a computer and computer hardware. In short, it's an interface between computer hardware and user. The purpose of an operating system is to provide an environment in which a user can execute programs conveniently and efficiently.An operating system is software that manages computer hardware.The hardware must provide appropriate mechanisms to ensure the correct operation of the computer system and to prevent user programs from interfering with the proper operation of the system. A more common definition is that the operating system is the one program running at all times on the computer (usually called the kernel), with all else being application programs.

Functions of an Operating System -

1) Process Management -

Manages processes in a system, including creation, scheduling, and termination.

Provides mechanisms for synchronization and communication between processes.

2) Memory Management -

Manages the computer's memory, including the allocation and deallocation of memory space as needed by programs.Ensures that each process has enough memory to execute while keeping the system stable.

3) File System Management -

Manages files on storage devices, providing functions like creation, deletion, reading, writing, and manipulation of files and directories.Ensures data is stored and retrieved in an organized manner.

Services provided by Operating System -

1) Program Execution -

Loads programs into memory, runs them, and handles their execution.

2) I/O Operations -

Facilitates input/output operations by providing a standardized way to interact with hardware devices.

3) File System Manipulation -

Provides services for file creation, deletion, reading, and writing, as well as management of file attributes.

About Linux and Unix -

Linux is an operating system that was developed by Linus Torvalds in 1991. The name “Linux” originates from the Linux kernel. It is an open-source software that is completely free to use. It is used for computer hardware and software, game development, mainframes, etc. It can run various client programs.

Unix is a portable, multi-tasking, bug-fixing, multi-user operating system developed by AT&T. It started as a one-man venture under the initiative of Ken Thompson of Bell Labs. It proceeded to turn out to become the most widely used operating system. It is used in web servers, workstations, and PCs. Many business applications are accessible on it.

Need of Linux Operating System-

1) Interface between the user and the computer -

An OS provides a very easy way to interact with the computer. It provides different features and GUI so that we can easily work on a computer. We have to interact just by clicking the mouse or through the keyboard. Thus, we can say that an OS makes working very easy and efficient.

2) Booting -

Booting is basically the process of starting the computer. When the CPU is first switched ON it has nothing inside the memory. So, to start the computer, we load the operating system into the main memory. Therefore, loading the OS to the main memory to start the computer is booting. Hence, the Os helps to start the computer when the power is switched ON.

3) Managing the input/output devices -

The OS helps to operate the different input/output devices. The OS decides which program or process can use which device. Moreover, it decides the time for usage. In addition to this, it controls the allocation and deallocation of devices.

4) Multitasking -

The OS helps to run more than one application at a time on the computer. It plays an important role while multitasking. Since it manages memory and other devices during multitasking. Therefore, it provides smooth multitasking on the system.

History Of Linux Operating System-

This operating system is built upon the Linux kernel (the core of the operating system) which was first released in 1991 by Linus Torvalds, a student from the University of Helsinki, Finland. Initially, Linux was only developed as a hobby and was not intended for widespread use. However, with the development of the internet, the Linux developer community grew, and Linux became increasingly popular. In 1993, Slackware became the first commercially released Linux distribution. Following that, several other Linux distributions emerged such as Debian, Red Hat, SUSE, and Ubuntu. Linux has become a very popular operating system among software developers due to its ability to be customized and modified to meet user needs. Additionally, Linux is also popular among server and end-user users, especially in business and government organizations. With the development of technology, Linux has also evolved to support mobile devices such as smartphones and tablets. One of the popular Linux distributions for mobile devices is Android, which is used on most smartphones worldwide.

Different Applications of Linux Operating System -

1) GIMP
2) Thunderbird
3) Audacity
4) VirtualBox
5) Brave

Experiment No - 2

Installation of LINUX Operating System -
(a) From Booting -

Step 1. Download a Linux distribution:

Choose a Linux distribution (e.g., Ubuntu, Fedora, Linux Mint) and download its ISO file.

Step 2. Create a bootable USB drive:

Use a tool like Rufus or Etcher to create a bootable USB drive from the ISO file.

Step 3. Boot from the USB drive:

Insert the USB drive, restart your computer, and enter the BIOS settings (usually by pressing F2, F12, or Del). Set the USB drive as the first boot device.

Step 4. Select the USB drive as the boot device:

Save the changes and exit the BIOS settings. Your computer should now boot from the USB drive.

Step 5. Choose the installation option:

You'll see a menu with options like "Try Linux" or "Install Linux." Choose the installation option.

Step 6. Follow the installation wizard:

The installation wizard will guide you through the process, asking for language, keyboard layout, timezone, and other settings.

Step 7. Partition your hard drive:

You'll need to partition your hard drive to create space for Linux. You can choose to replace your existing OS or dual-boot.

Step 8. Install Linux:

The installer will copy files, install the OS, and configure your system.

Step 9. Set up your user account:

Create a user account, set a password, and choose other settings.

Step 10. Reboot and enjoy Linux:

Once the installation is complete, reboot your computer, and you'll be running Linux.

(b) From Virtual Box -

Step 1. Download the Linux OS ISO file from a reputable source.

Step 2. Open VirtualBox and click "New" to create a new virtual machine.

Step 3. Name your virtual machine and select the type (Linux) and version.

Step 4. Allocate RAM and CPU resources to the virtual machine.

Step 5. Create a virtual hard disk (VDI) and set its size.

Step 6. Click "Settings" and go to the "Storage" tab.

Step 7. Under "Controller: IDE," click the empty CD/DVD drive and select the Linux OS ISO file.

Step 8. Click "OK" and start the virtual machine.

Step 9. The Linux OS installation process will begin. Follow the on-screen instructions to complete the installation.

Step 10. Once installed, remove the ISO file from the virtual CD/DVD drive and restart the virtual machine.