**EXPERIMENT-1**

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**COURSE – OPERATING SYSTEM**

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**SLOT- E21+E22+E23**

**OBJECTIVE**- The objective of this practical is to obtain detailed overview on various popular OS.

Pick any 5 Concepts in OS of your choice and compare with any 3 popular OS.

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| **OS →**  **---------------------------------**  **Properties**  **↓** | **Windows** | **Linux** | **Mac OS** |
| **1) GUI. (Graphical User Interface. Type command on keyboard to interact with system.)** | Windows have basic and standard taskbar, menu and desktop.  This also one of the reason for immense popularity of windows. | Compared to Windows, Linux has a complex version structure.  The open-source nature of Linux has resulted in the introduction of hundreds of Linux-based OS known as ‘distros’. | Mac OS can only be used on Apple devices. It has a user-friendly interface.  Mac os is even considered easier to use than windows by many users. |
| **2) Command terminal** | A terminal or command prompt is a black box ideally used to execute commands. It is also called the Windows Command Processor. It is used to execute commands and different batch files. It can also be used for administrative functions and troubleshoot and solve all windows issues. | Linux also provides a terminal. You can find terminal at: Applications -> System or Applications -> Utilities. In addition to this, there is also a shell prompt. The most common shell used in bash. It defines how the terminal will behave and look when it is run. | MAC provides a console as a terminal application. It has a console, command line, prompt and terminal. Command line is used to type your commands. Prompt will provide you with some information and also enable you to run commands. A terminal is an actual interface which will provide the modern graphical user interface as well. |
| **3) Security** | Windows Security provides the antivirus protection. Windows Security continually scans for malware (malicious software), viruses, and security threats. In addition to this real-time protection, updates are downloaded automatically to help keep your device safe and protect it from threats | The protections in macOS work to keep your system safe from malware. This starts with state-of-the-art antivirus software built in to block and remove malware. Technologies like XD (execute disable), ASLR (address space layout randomization), and SIP (system integrity protection) make it difficult for malware to do harm, and they ensure that processes with root permission cannot change critical system files.  Compared to windows, macOS has poor security it is because of the less user using this OS the company did not worry the security much. | Linux provides following system security - system firewall, file permissions, encrypted storage, Secure Remote Access, Resource Allocation Controls, system recovery and host integrity testing.  Similar to macOS, Linux security is poor because of fewer users. |
| **4) File structure** | Windows follows a directory structure to store the different kinds of files of the user. It has logical drives and cabinet drawers. It also has folders. Some common folders like documents, pictures, music, videos, and downloads. All these files can be stored in these folders and also new folders can be created. It also has files which can be a spreadsheet or an application program. It can have extensions as .txt, .jpg etc. | Linux has a completely different file structure form Windows. It was developed with a different code base. It stores data in the form of a tree. There is a single file tree and all your drives are mounted over this tree. | The file structure of MAC is commonly known as MAC OS X. If you go to dig into your MAC’s hard disk through finder you will see many directories. The root directory of MAC may encounter when they visit their own MAC book. You can explore the file system and directory structure by going to directories like /Application, /Developer, /sbin, /tmp, etc. |
| 5) **Multitasking** | Multitasking in Windows relies more heavily on threads than processes. (A thread is a construct that enables parallel processing within a single process.) Creating a new process is a relatively expensive operation while creating a new thread is not as expensive in terms of system resources like memory and time. Hence, multiprocess-oriented applications on UNIX typically translate to multithreaded applications on the Windows platform, thus saving such system resources as memory and time. | Multitasking in Linux is a multiprocessing, multiuser system. At any given point, you can have many processes running on LINUX. Consequently, LINUX is very efficient at creating processes. | The Mac OS 8 operating system implements cooperative multitasking between applications. The Process Manager can keep track of the actions of several applications. However, each application must voluntarily yield its processes time in order for another application to gain it. An application does so by calling WaitNextEvent, which cedes control of the processes until an event occurs that requires the application’s attention. |