ASSIGNMENT 1

**QUE:-1. What is Operating System? Explain with Example?**

**Ans:-**

The operating system (OTS) is the system used by Mangesh Computer Hardware, Software Resources, and Providence Common Services for Computer Programs.

        Example:-

Laptops, tablets, and desktop computers are all run operating systems that you've probably heard of. Some examples include versions of Microsoft Windows (like Windows 10, Windows 8, Windows 7, Windows Vista, and Windows XP), Apple's macOS (formerly OS X), Chrome OS, BlackBerry Tablet OS, and flavors of the open source operating system Linux. General Chat Chat Lounge.

**QUE:-2. Advantage or Disadvantage of OS?**

**Ans:-**

### **Advantages:-**

**Computing Source**

An operating system acts as an interface between the user and the hardware. It allows users to input data, process it, and access the output. Besides, through the operating system, users can communicate with computers to perform various functions such as arithmetic calculations and other significant tasks.

**User-Friendly Interface**

Windows operating system, when it came into existence, also introduces Graphical User Interface (GUI), which made using computers much more natural than earlier Command Line Interface. Moreover, users can quickly understand, interacts, and communicate with computer machines.

**Resource Sharing**

Operating systems allow the sharing of data and useful information with other users via Printers, Modems, Players, and Fax Machines. Besides, a single user can share the same data with multiple users at the corresponding time via mails. Also, various apps, images, and media files can be transferred from PC to other devices with the help of an operating system.

**No Coding Lines**

With the invention of GUI, operating systems allow accessing hardware without writing programs. Unlike, earlier users don’t have to write code of lines to access the hardware functionality of a computer system.

**Safeguard of Data**

There’s a lot of user data stored on the computer, and that can only be accessed with the help of an OS. Besides, storing and accessing the data, another important task of an OS is to safely and securely manage the data. For example, Windows Defender in Microsoft Windows detects malicious and harmful files and removes them. Also, it secures your data by storing them with a bit to bit encryption.

**Software Update**

An operating system is a software which needs to update regularly to control high fleeting features that are continually increasing. With other apps and software hitting updates to improve their functionality, OS must improve their benchmarks and handle all the working of a computer. An OS can easily be updated without any complexity.

**Multitasking**

An operating system can handle several tasks simultaneously. It allows users to carry out different tasks at the same point in time.

**Other Advantages**

* An OS allows installing of different types of apps and run them
* OS improves work efficiency and saves time by reducing the complexity
* Also, it helps in reducing the efforts need to access various data
* Data can be copied, deleted, moved, and restored from the computer system
* Every system component is independent of each other, so the failure of one system will not affect others

### **Disadvantages:-**

**Expensive**

When compared to the open-source platforms like Linux, some operating systems are costly. While users can use a free OS but generally they are a bit difficult to run than others. Moreover, operating systems such as Microsoft Windows with GUI functionality and other in-built features carry a costly price tag.

**System Failure**

If the central operating system fails, it will affect the whole system, and the computer will not work. Moreover, an OS is the heart of a computer system without which it cannot function. If the central system crashes, the whole communication will be halted, and there will be no further processing of data.

**Highly Complex**

Operating systems are highly complex, and the language which used to establish these OS are not clear and well defined. Besides, if there’s an issue with OS users cannot directly understand, and it cannot be resolved quickly.

**Virus Threats**

Threats to the operating systems are higher as they are open to such virus attacks. Many users download malicious software packages on their system which halts the functioning of OS and slow it down.

**Fragmentation**

Fragmentation in the computer is a state when storage memory breaks into pieces. Internal fragmentation occurs when the method of process is larger than the memory size. External fragmentation occurs when the method or process eliminates.

**QUE:-3. Difference between OS & MAC OS?**

**Ans:-**

|  |  |  |
| --- | --- | --- |
|  | **Mac** | **PC** |
| **What is it?** | Short form for “Macintosh” and refers to any computer produced by Apple, Inc. | Refers to any computer running IBM-Based (Windows, Linux, Solaris, FreeBSD) operating systems. stands for "Personal Computer" |
| **Cost** | Computers start at $499 for the Mac Mini desktop, $899 for the Macbook Air notebook, and $1099 for the iMac all-in-one. Other models are more expensive. For desktop or home use Macs are generally expensive than a PC. | Compared to a Mac, Windows and Windows-associated hardware is cheaper, and you can build your own for even less money. Comparable computers running Windows can be found around 40% cheaper than a Mac. |
| **Manufacturer** | Apple Inc. | Several companies: HP, Toshiba, Dell, Lenovo, Samsung, Acer, Gateway etc. |
| **Development and Distribution** | Macs are developed and distributed by Apple Inc. | PCs are manufactured and distributed by hundreds of manufacturers. |
| **Company / developer** | Apple, Inc. | Microsoft (Windows), Ubuntu (Linux), Sun (Solaris), etc. |
| **User** | Home users and businesses (mainly in the creative department) | Home users and businesses |
| **OS family** | Unix-like (BSD>Darwin>Mac) | Windows, Linux, Solaris, FreeBSD, etc. |
| **Piracy Prevention** | Activation is not required, can reinstall as many times as needed. | Windows has a unique activation key for each package distribution, and lots of custom and OEM PC appears, so genuine checking become important. Linux, Solaris, FreeBSD is free and no need for those keys. |
| **Available language(s)** | Multilingual | Must purchase a different OS Version, but has multiple languages available. |

**QUE:-4.Characteristic of OS? Explain in brief with Example?**

**Ans:-**

**Characteristic of OS:-**

## **Multitasking Systems**

Most modern [operating system](http://ecomputernotes.com/fundamental/disk-operating-system/what-is-operating-system)s allow running multiple tasks both: a [computer](http://ecomputernotes.com/fundamental/introduction-to-computer/what-is-computer) can, while executing a user program, read the data from a disk or display results on a terminal or [printer](http://ecomputernotes.com/fundamental/input-output-and-memory/what-is-a-printer-and-what-are-the-different-types-of-printers). We talk about multi-tasking operating system or multi-programmed in this case.

### **Process**

The fundamental notion of multi-tasking operating systems is the process. the program concept is not enough. Nothing prevents the same program is executed several times simultaneously: one may want, for example, two windows emacs or two gv windows to compare texts.

A process is a program instance being run.

A process is represented by a program (the code), but also its data and by parameters indicating where it is, allowing it to continue if it is interrupted (execution stack, program counter ...). We talk about the program environment.

A process is also called task in the case of Linux.

### **Timeshare**

Most multi-tasking operating systems are implemented on a computer having a single [microprocessor](http://ecomputernotes.com/fundamental/terms/microprocessor). This one, at a given moment, really runs one program, but the system can do switch from one program to another by running each program for several tens of milliseconds; This gives users the impression all programs are executed simultaneously. This is called system timeshare.

Some call pseudo-parallel this very rapid switching of a processor program to another, to differentiate it from true parallelism that occurs at the equipment when the processor works in conjunction with some of input-[output device](http://ecomputernotes.com/fundamental/input-output-and-memory/list-various-input-and-output-devices)s.

### **Abstraction of the course**

Conceptually, each process has its own virtual processor. Of course, the real processor switches between multiple processes. But to understand the system, it is pre- preferable to think of a set of processes that are running in (pseudo) parallel rather that the allocation of the processor between different processes. This rapid switching is applied multi-programming.

Figure 1 shows four processes running simultaneously. Figure (b) shows an abstraction of this situation. The four programs become four independent processes, each with its own flow control (that is to say, their program counter). In Figure (c), it can be seen that, over a time interval sufficiently big, all processes have improved, but at a certain moment, there is only one process assets.

### **Environment Variables**

As we have already said, the program is insufficient data to determine a process. It should indicate a number of environment variables: the files on which it operates, which is the program counter, etc. These environment variables are necessary for two reasons:

The first is that two processes can use the same code (two emacs windows example), but the affected files may be different; the program counter does not be in the same place.

The second is due to the multi-tasking nature processed by pseudo-parallelism. Periodically, the operating system decides to stop a running process to start executing another process. When this process is suspended temporarily, it must be able to find later the exact state it was in time of suspension. This requires that all the [information](http://ecomputernotes.com/fundamental/information-technology/what-do-you-mean-by-data-and-information) he needs to be saved somewhere for her on hold. If it has, for example, several open files, positions in these files should be stored.

The list of environment variables depends on the operating system in question, even its version. It is located in the descriptor of the process.

### **Memory space of a process**

In many operating systems, each process has its own memory space, not available to other processes. We speak of the address space of the process.

### Affect the treatment durations

Since the processor switches between processes, speed of execution of a process is not uniform and is likely to change if the same processes are executed again. So do not make the process any presumption on factor time.

Consider the case of an input-output process which starts the engine of a drive diskettes, runs 1000 times a loop for the speed of the disk is stabilized, then requests reading the first record. If the processor has also been allocated to another process during execution of the loop, the input-output process may be reactivated too late, that is to say, after the passage of the first record before the playhead. When a process needs to measure time accurately, that is to say, when some events need to happen every few milliseconds, take special measures to make sure. It then uses timers, as the see.

However, most processes are not affected by the multi-processor programming and by the differences in execution speed between them.

## **Multi-user Systems**

A multi-user system is able to perform so (pseudo-) and competing Separate applications belonging to several users.

Competing means that applications can be active at the same time and hassle access to different resources such as CPU, memory, hard drives ...Independent means that each application can perform their work without worrying what are the applications of other users.

A multi-user system is necessarily multi-tasking, but the converse is false: the MS-DOS operating system is single-user and single-task; MacOS 6.1 and Windows 3.1 is single user but multitasking; UNIX and Windows NT are multiuser.

### **Mise in place**

As for multi-tasking systems, multi-use is emulated by assigning period time to each user. Naturally, the fact to switch from one application to another slows each and affects the response time perceived by the users.

### Associated mechanisms

When they allow multi-use, the operating system must provide a number of mechanisms:

- An authentication mechanism for verifying the identity of the user;

- A protection mechanism against erroneous user programs that could block other applications running on the system, or malicious, which could disrupt or spy on the activities of other users;

- An accounting mechanism to limit the amount of resources allocated to each user.

### **Users**

In a multi-user system, each user has a private area on the machine: generally, it has a certain quota of disk space to store its files, receives private e-mails, etc. The operating system must ensure that the private party space a user can not be visible to the owner. He must, in particular, ensure that no user can not use an application of the system the purpose of violating the private area of ​​another user.

Each user is identified by a unique number, called the ID of the user, or UID (User Identifier). In general, only a limited number of persons allowed using a computer system. When one of these users starts a work session, the operating system asks for a user name and password. If the user does not respond with valid information, access is denied.