1. # OPERATING SYSTEM

- what is O.S
- functions of O.S
- Services Provided by O.S
- features of O.S
- Types of O.S

* objectives of O.S :-

1. The main objective of O.S is to improve the efficiencicncy & performance of the Comp. system.

2. The Purpose of O.S is to Provide environment in which user can execute the Program in easy & efficient manner.

Q. what is O.S ? Explain various functions of O.S ?

⇒ Defination ⇒

1. O.S acts as interface b/w user & comp h/w

2. O.S is a software Program that manages the Computer hardware.

3. O.S is a set of Program that manages overall Operations of computer system.

* function of O.S :-

There are various functions of O.S that are given below :-

① Process mgmt
② memory mgmt
③ file mgmt
④ Device mgmt
⑤ I/O mgmt
⑥ Job Priority
⑦ Secueity.

short form.
PMFDIJS

1. Process mgmt :-

1) the process mgmt module of an O.S takes care of various activities related to Process i.e: Creation Process, deletion of Process i.e terminate Process.

2) Scheduling of various system resources to the different Process.

2. Memory mgmt :-

1) To exicute every Program that must be loaded together with data into the main memory

2) memory mgmt module of O.S deals with various activities related to the memory i.e it take as take care of allocation of memory & deallocation of the memory space

3) It is also used to improve the CPU utilisation & provide better response time.

3) file mgmt :-

- file mgmt module of O.S take care of various activities related to file such as create, delete, open, read, write, rename, modifg, copg, close & move file from one folder to the another folder etc.

4) Device mgmt :-

i) Computer system normally Consist of I/O devices such as scanner, printer, keyboard mouse etc.

ii) The device mgmt module of O.S take care of various activities related to the device such as attach device & detach/relase device.

5) I/O mgmt :-

i) I/O mgmt if we want some output from O.S then you can pass some input the O.S

ii) O.S concept that input data & process on the data & provides the desired outputs.

6) Job Priority :-

i) Priority means Preference given to the exicution of the Program.

ii) Priority determines the order in which jobs are to executed in the O.S.

iii) in the job Priority lowest number shows the highest Priority.

7) Security :-

I) most of the computer system used to store large amount of information some of which is highly sensitive & valuable to the user.

II) so, we need to Protect that information from unauthorised user.

III) Security module of O.S ensures that one Process does not interface with other Process.

* Services Provided by O.S :-

Q. what is O.S ? Explain various Services Provided by O.S ?

⇒ I) Program exicution
II) I/O operations
III) file System manipulation

iv) Communication.
v) error detection.
vi) Accounting
vii) Protection.

Operating system Provides several services that can be given below :-

I] Program exicution →
i) To exicute every Program that must be loaded into the machi memory. so O.S first load the program into the main memory then exicute the Program.
ii) That Program must be able to end its exicution either normally or abnormally.

II] I/O Operations →
i) To Perform the I/O Operation Program may requires some I/O devices.
ii) In I/O Operation we Provide some input to the computer system & gets the desire outputs.

III] file system manipulation →
i) In the file system manipulation we are able to modify the file.
ii) In the file system manipulatn Program needs to read & write file.
iii) the O.S gives Permission to Perform the basic operation of file i.e: update, delete, & modify etc.

iv] Communication ⇒

i) Exchange of informatn from one Process to another is called Communication.

or.

i) Data transfer betn two Process is also called communication.

ii) in o·s comm. can be implemented in two ways :-

- i] shared memory comm
- ii] Message Passing comm.

iii) i] shared memory comm :-

In shared memory comm two or more Process can shared common memory area of their exicutions

ii] Message Passing comm :-

In Message Passing comm message is sent from one to another computer & viceversa.

e·g :- Chatting betn two persons.

v] Error Detection ⇒

i) error may occurs in CPU, I/O devices memory, hardware.

ii) So, that O·S constantly needs to aware of this possible error

iii) It should take appropriate action to solve the error (bugs).

vi] Accounting :-

i] In the accounting the logs of each users must be kept

ii] It is also necessary to keep the record of which user accessing how much & what kind of computer resources.

vii) Protection :-

i) O.S provides the facility of Protectn.

ii) Security starts with each user having to authenticate the system by using passwords

iii) external I/O devices must be protected from invalid access attempts

* features of O.S :-

Q. Explain features of O.S?

⇒

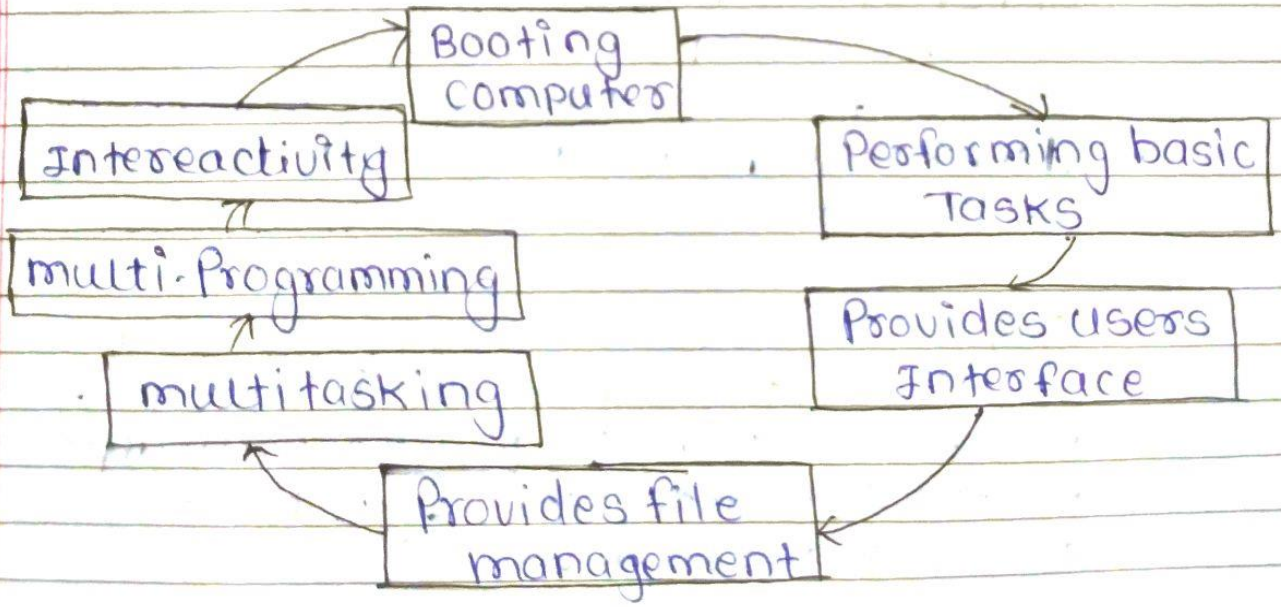


fig:- features Of O.S.

I] Booting the Computer System :-

"The Process of starting or restarting of Computer is known as booting."

there are two types of Boots :-

a) Cold boot
b) warm boot.

a) cold boot :-

Cold boot is the Process turn on the Computer that has been turn off the completely.

b) warm boot :-

warm boot is the Process of restarting the computer.

II] Performs basic Computer tasks :-

the O.S performs basic computer tasks such as managing the various devices such as Mouse, keyboard, & Printers.

e.g :-

Most O.S how are plug & play i.e device such as printer will automatically deticated & configured without users interventions.

III] Provides user interface :-

A user interacts with software through user interface.
The main two types user interface are available -

a] Command line interface.
b] GUI

a] Command line interface →

In Command line interface the users interacts with O.S by typing commands to performs specific tasks

e.g :-
Dos (Disk Operating System).

B] GUI :-

Users interacts with O.S by using mouse to access windows, icons & menues & keyboards

e.g ⇒ windows, windows 7, whista etc.

IV] Provides file mgmt ⇒
The O.S Provides features file mgmt that allows users to perform following tasks such as -

i) Creating file
ii) Copy
iii) Delete
iv) trunket
v) file from one to another folder
vi) update.

the O.S also keeps the tracks of where file are located on harddrive or hlw & o type of file.

v] Multi-Tasking :-

i) multitasking refers to multiples jobs are exicuted by cpo simultaneously by switching betn them.
ii) O.S does the following activities related to multitasking.
a) The users gives the instructn O.S & receive the immidiate response.

b) O.S handles multitasking in the way that it can handle multiple Operations at time.

vi] Multi-Programming :-

when two or more Programs residing in a memory at the same time. two or more programs sharing the common processor is refered as multiprogramming

ii) It is increases CPU utilisation.

VII) Intereactivity:-

With the help of intereactivity features users is capable to intereacts with computer system.

O.S system does the following activities related to intereactivity -

a) O.S Provides user interface to intereact system the input from users

e.g- keyboard, mouse etc..

b) O.S manages the input devices to take to show the outputs from the users.

e.g- Printer & monitor etc.

* Types of O.S.

Q Define the term O.S. Enlist & explain the diff. types of O.S.

Ans There are several types of O.S that are given below:-

1. Batch O.S
2. Realtime O.S
3. Multiprocessing O.S
4. Distributed O.S

① Batch O·S ⇒

i) Batch Processing generally requires Prog. that data & appropriate commands to be submitted in the form of jobs.
ii) Batch O·S usually allow little interaction or no interactn b|w users & executing Programmes
iii) Batch O·S is not Convient for Program development.
iv) Programmes that do not requires interaction may be served well as by batch O·S
v) scheduling in the batch O·S is very simple. Jobs are processed in the first come first serve basis.

- Disadvantages :-

① there is lack of interaction b|w user & the Prog.
② CPU is ideal b'coz speed of I|O devices are slower than CPU.
③ Difficult to Provide the desired Peiority

② Real time O·S-

i) In real time O·S time interval required to process & response to its input is so small.
ii) Real time Processing is always online whereas online system need not be real time.

iii) the time taken by a system to respond to it's input & Display required updated info. is known as response time. so in this method response time is very less.

iv) there are 2 types of Real time O.S
1) Hard Real time O's
2) Soft Real time O.S

v) i) Hard RT O.S :-
i) In this type of O.S there is guarantiee that Critical task is completed on time.
ii) in HRTOS, secondary storage is limited or missing.
iii) In hard Real time system virtual memory is never found.

ii) Soft RT O.S :-
I) in Soft RTOS there is no guarantiee that critical task will be completed on time.
II) SRTs are less resteicative.
III) Critical Real time task gets Priority over the Other task.

③ Multi-Processing O.S ⇒

i) Generally comp. system has Single Processor means comp have just one CPU for Processing the instruction. But if the user is running multiple jobs then this will decrease the speed of CPU.

ii) So, to increase the speed of Processing we uses multiprocessing
iii) In multiprocessing there are 2 or more CPU in a single O.S
iv) If one CPU gets fails then other CPU is used for Providing the backup to first CPU.
v) So, with the help of multiprocessing User can execute multiple jobs at the same time.

- Advt ⇒

2 marks
① High speed
② increases the throughput

- Defn :-

No. of tasks completed Per unit time is called as throughput.

③ It increases the reliability of app

- Disadvt ⇒

① High cost
② multiprogramming Systems are more expensive.
③ Complex O.S. is required.
④ If one Processor fails then it will affect other's Speeds.
⑤ large main memory is required.

4] Distributed operating System ⇒

1] Distributed means data is stored & Process on multiple location

2] Distributed means in the network (i.e collectn of computers connected with each other)

3] if User wants to take some data from other computers then distributed O.S is used

4] in this system data is shared b/w many users & they can also access all the I/O devices.

Advt :-

① Sharing facility ⇒
User at one side may be able to use resources available at another sites.

② Exchange of Data ⇒
By using a distributed O.S users are able to exchange of data from one computer to another computer.

③ if one site fails in distributed system the remaining sites can continued operating

④ it Provides bettee seevices to the customee.

:- Test question :-

Q. what is O.S? explain funct^n of O.S.
Q. Explain various servies Provided by O.S
Q. what is O.S & explain features of O.S.
Q. what is O.S & explain real time of O.S.
Q. write a short note on Batch O.S?

Q. what is Process & explain various states of Processes with suitable diagram.
Q. what is PCB and Explain PCB with suitable diagram.
Q explain various operat^n on Process.
Q what contex switch & write a short note on contex Switching.