

Operating System.

27-09-2021

Date:

VMware Workstation

Purpose behind virtual machine is Player.

↳ we can use multiple operating system on virtual machine. ↳ Virtual Machine.

Dir → DOS directory.

APP

Application Software → MS office, games etc

System software → Utility software → DOS, Linux, Operating System!
↳ Cleaner Free

Kernel → core of operating system (all)
Windows, Linux & Android.

(UBANTO ^{software} have terminal (command prompt)).

↳ LS → list structures folder.

DOS → cd Users (to go to user folders).

DOS → CLS → to clear screen

Ubuntu → clear //

Linux → list files

↳ LB

↳ clear → to clear

→ cd Desktop (to go to Desktop)

→ for back enter (cd)

→ for download cd Download

→ cd n2tutorials/

it show that it has sub folder C:/user/

ubuntu 64-bit

DOS

→ cd thinkpad → Press enter
folder name

↳ cd thinkpad dir.

for back ←

C:/user/thinkpad cd ..

C:/user/thinkpad..

C → folder.

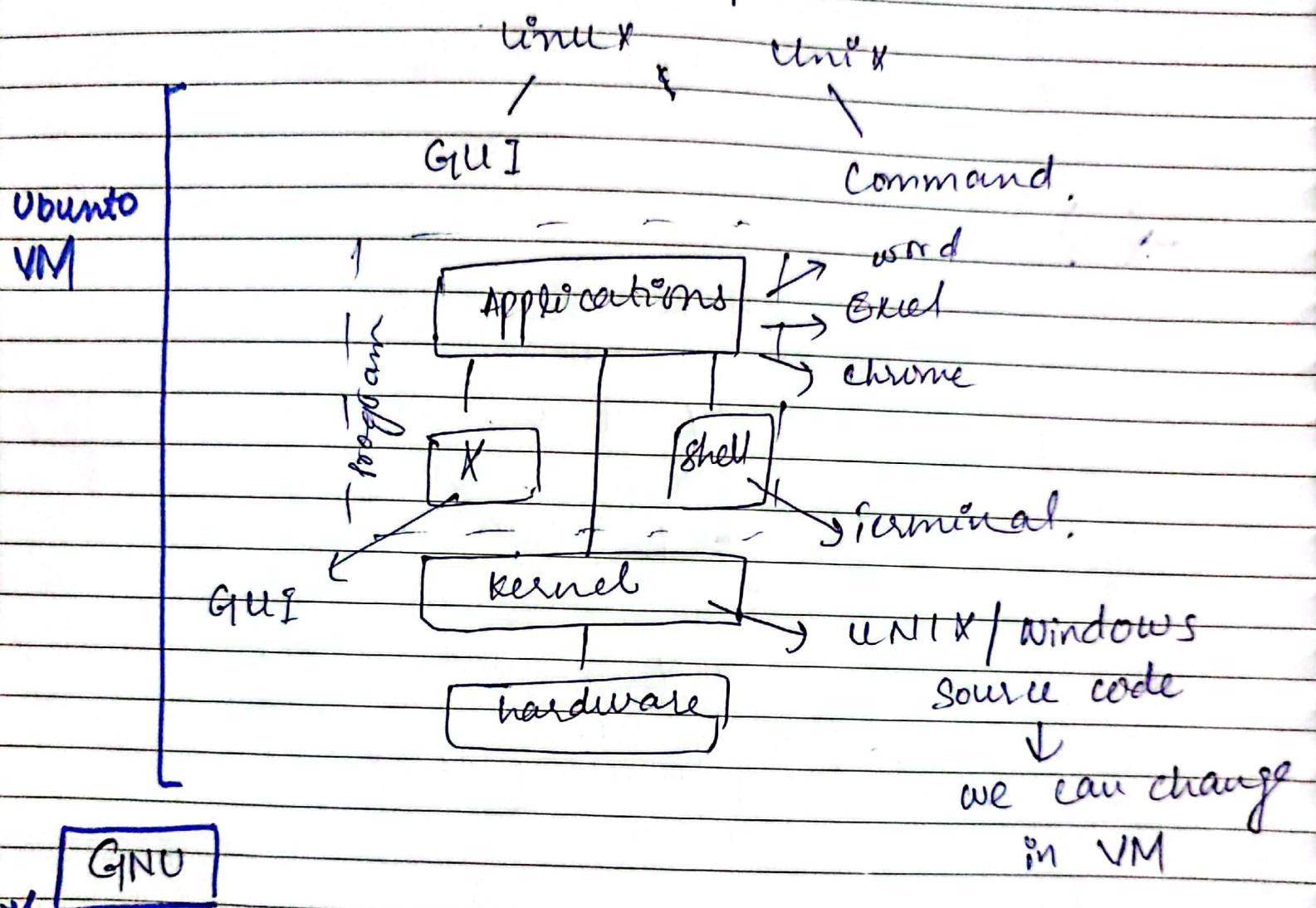


LAB 1

Lecture ②

Date: 5-Oct-2021

GUI Graphical user interface.



If we run android emulator on VMware then we can change its source code.

Q Who is behind ubuntu op?



terminal
↳ log to (pin to desktop).

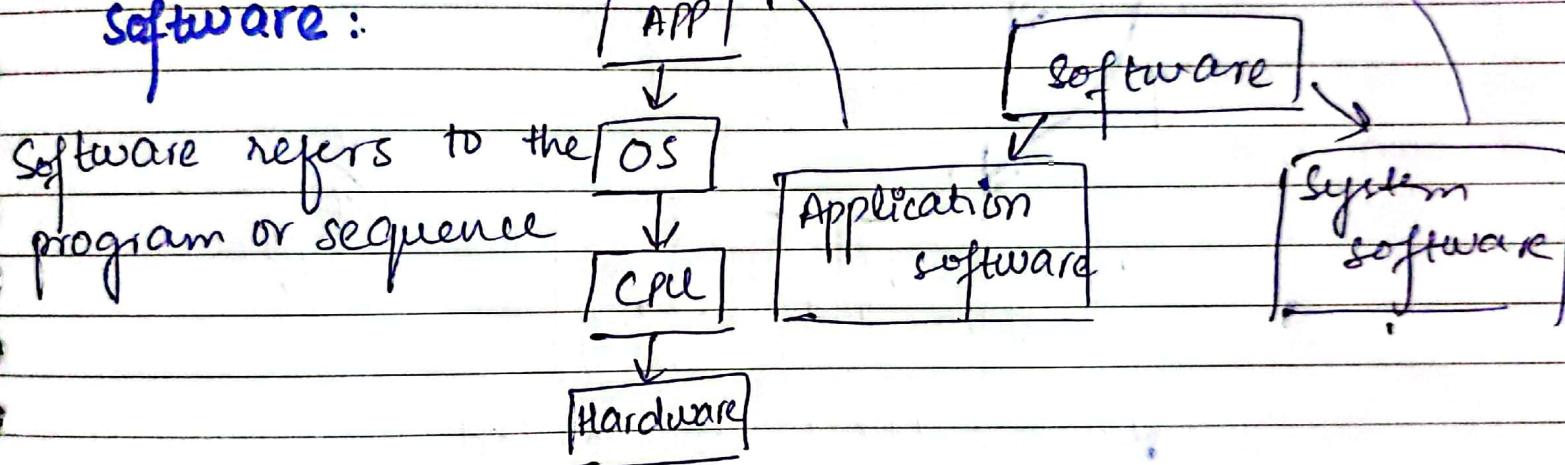
Date: 7-Oct-2021

Lect ③

Principle of Information and operating systems
computer main components.

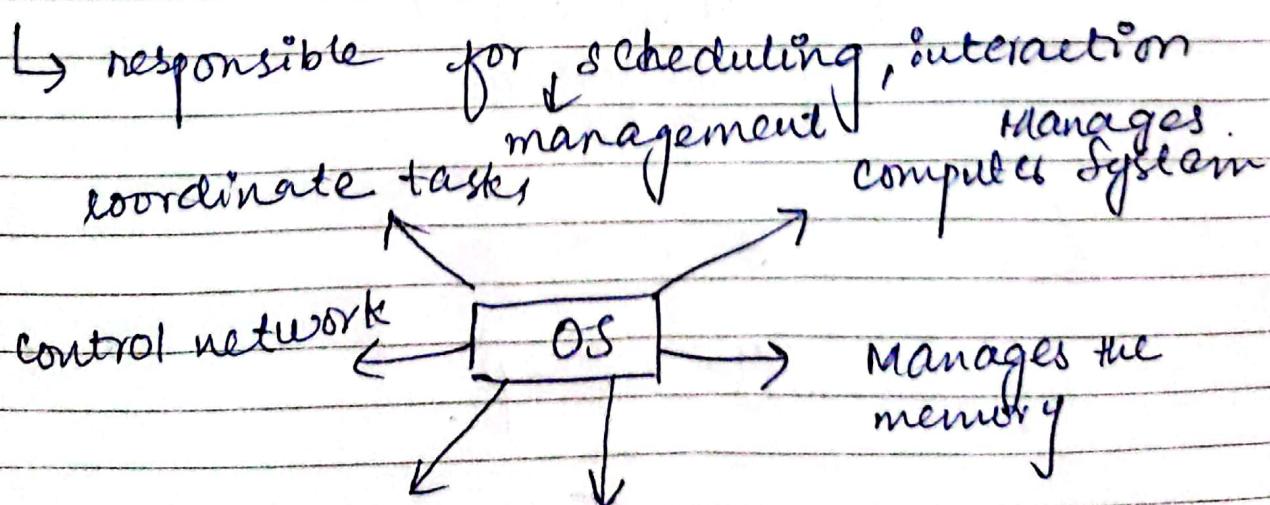
operating so
duty software } system software

software :



Operating System:

↳ control computer system function and manages the hardware (CPU, memory,



Utility Programs:

① cleaner free ② Defraggler

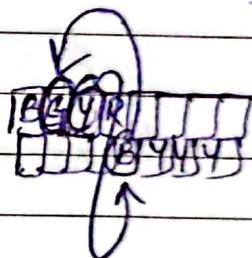
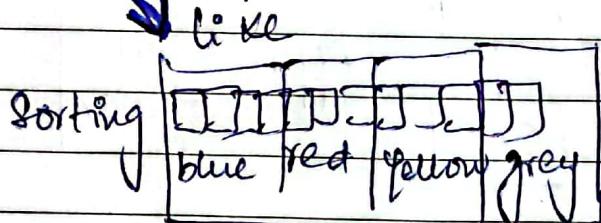
It removes extra files and also free white files/programs are unnecessary and suggests to remove it.

Date with no fragmentation
Blue → Complete files

sort. u l'

It groups fragments together.

It increases system speed.



* if new file is downloaded
it will first fill blank grey space between the blue and all boxes then it will be sorted by defraggler.

Networks X
slide

3 - Adobe

4 - Notepad



⑤ Speedy → tells all features of computer e.g
memory, temperature, cache, RAM, graphics etc.

⇒ OPERATING SYSTEM

→ Purpose

→ startup process and shutdown options X

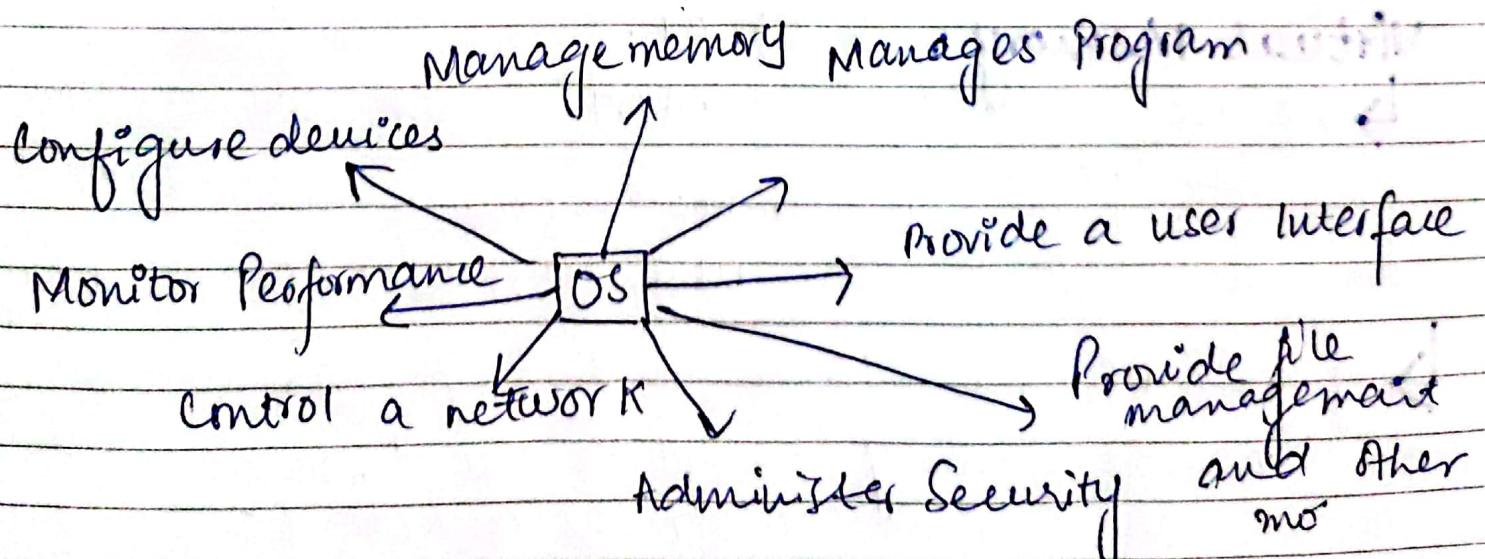
→ Explain how an OS provides a user interface, manages programs, manages memory, and coordinates tasks

→ Every process has PS ID How can we can or initiate it?

FOXT PDF 8994

→ how an os enables users to configure devices, establish an Internet connection

↳ Task Manager ↳ Linux Process → PID → Process ID



OS Function

→ effects your productivity

Date: _____

→ Command line interface (CLI),

↳ MS DOS

cmd

Terminal (shell)

↳ Linux → CLI

Linux → GUI

→ Single tasking and multitasking

→ foreground & background

→ Single and multi user Mac OS

↳ Windows, android

except iPhone, iPad

In Task Manager

Suspended Process

↓
background

foreground

Single Tasking

→ runs one program at a time

→ e.g. Email (before going to next task you should

Multitasking

exit the browser).

→ runs multiple programs at same time reside in memory

Virtual Memory: → Slower.

↳ we use hard disk as a RAM such as on VMware
some portion of when it exceeds such as 2GB then it takes Memm from hard disk

we use 1GB to run ubuntu it uses RAM and

↳ If your PC has 16 Gb and 80% has used then virtual memory concept is used, hardware will become as a RAM or act as a RAM (Small portion not all).

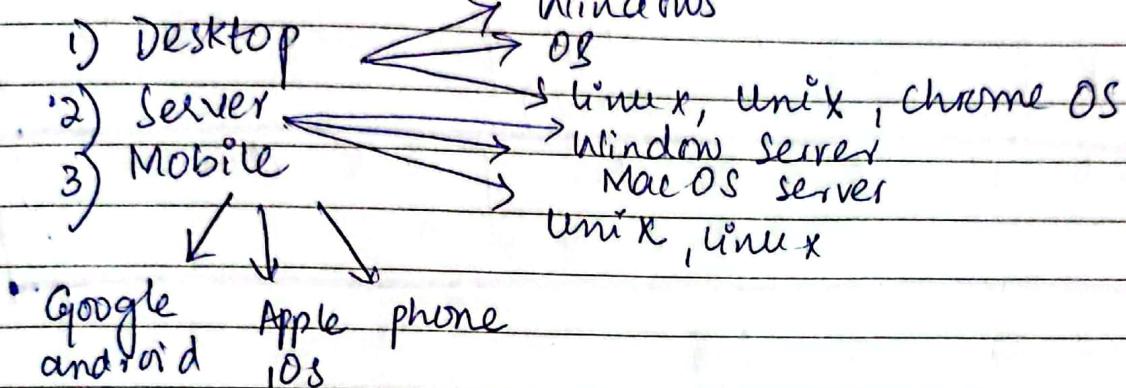


Lec ④

Date: 11-Oct-2021

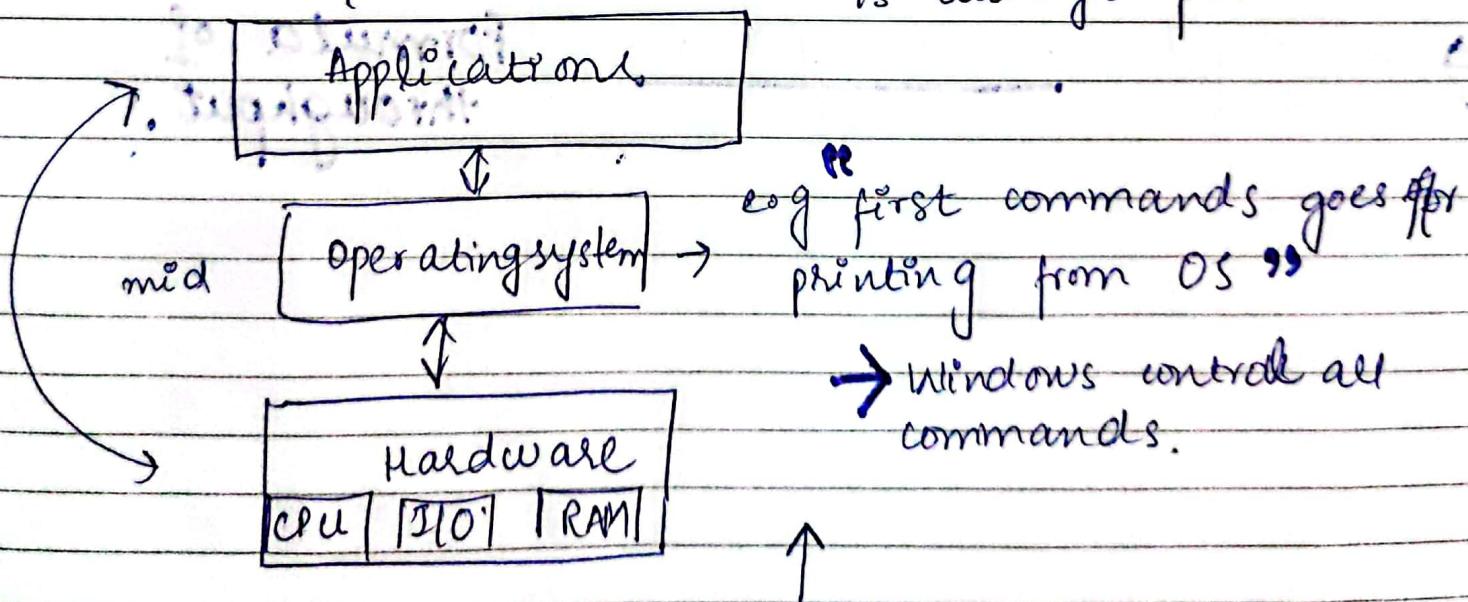
"Virtual RAM is slower than Actual RAM"

Types of Operating system → based on hardware device.



Desktop operating system:

User 1 User 2 ⇒ In between hardware and Application there is always operator



Q: Illustrate the framework of an operating system.

⇒ this diagram and explanation



market share

Date: _____

⇒ Windows has market capture about 80%, because it is convenient 95% and very user friendly and has GUI (Graphical User Interface).

→ throughput (Linux) (number of tasks divide by time)

throughput → high → number of task divide by time → high.

⇒ Unix can run on 1GB

⇒ We use Linux, Unix for server hosting... because of speed.

throughput & speed.

⇒ throughput = $\frac{\text{number of tasks}}{\text{time}}$ formula of throughput.



~~Operating System~~

lec(5) :-

Date: 13-Oct-2021

Operating System and its function:-

- application always take command from operating system.
- throughput → relationship → speed (high).

Resource Management:-

- important part of operating system
- use of calls or calls.
- No of website requests and resources how many resources are required to manage that in term of CPU, RAM and storage.

- 1 req accept requires 10MB in RAM
- related to CPU, hardware, memory RAM.

Process Management:-

Multiple Process execution done by the CPU

It's relation is with CPU.

Storage management:

file system storage (linked with)

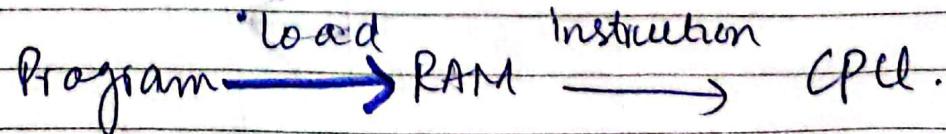
Memory Management:

basically to do with RAM.

HD → 500gb } size limited → Need of management
RAM → 16gb }

(necessary)

* All programs and processes are executed in the RAM not on the harddisk.

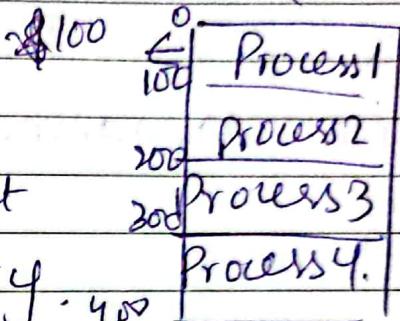


→ All processes are brought into RAM and then
scheduled by CPU one by process.
Once process is executed and deleted from RAM
it is deleted from RAM as space of RAM is
limited the next process is brought into (RAM)
this is called swapping.

Security and Privacy::

Process ① occupies $\boxed{100}$ such that

Process ② cannot take this memory.



Each process has memory allocated in the RAM
No process can access memory of another process.

NO of tasks, throughput
idle Time

AES, DES
↳ Authentication

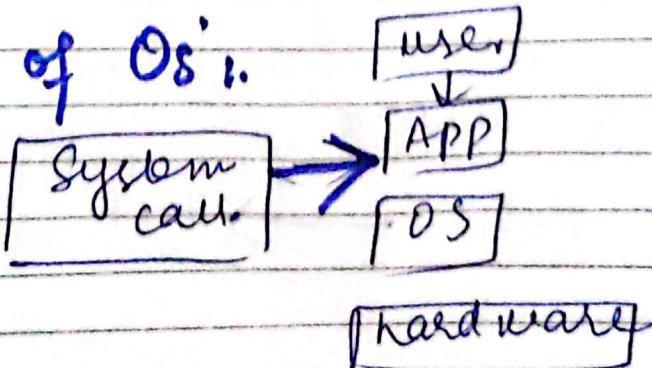
throughput of tasks.

$\alpha \frac{1}{\text{time}}$

CPU Key Requirements.

- ① Fast task completion
- ② less RAM consumption

System calls of Os::

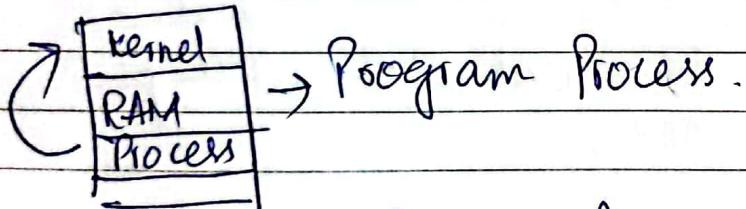


System calls

System calls.

Date: _____

1. File related \Rightarrow open(), Read(), write(); close(), create file etc.
2. Device Related \Rightarrow Read, write, Reposition, I/O, file control, Ppct()
3. Information \Rightarrow get Process id, attributes, get system time and data.
4. Process control \Rightarrow Load, Execute, abort, fork, wait signal, Allocate etc
5. Communication \Rightarrow pipe(), Create | delete connections, sharedmemory()
↳ shmemget().



Multithreading \rightarrow Parallel Processes run on the CPU
Interprocess communication is done using pipe() communication.

shmemget() shared memory

ch mode \rightarrow changemode() \rightarrow Permission for users to access the file or do any changing in it.



for one CPU

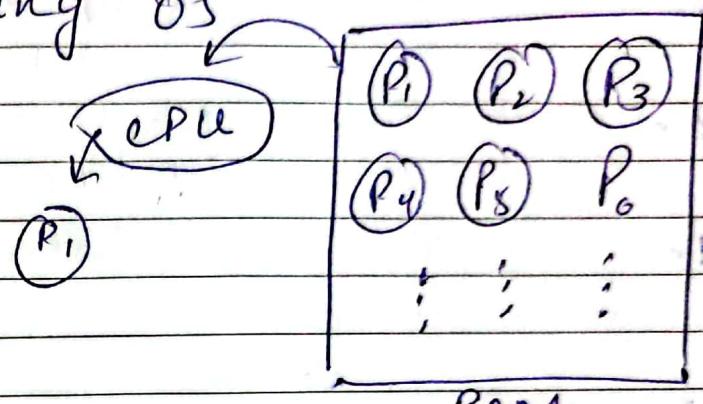
Lee ⑥

Date: 28. Oct - 2021

① Multiprogrammed OS - Now preemptive

↳ avoid IDLENESS

② Multi tasking | Time sharing OS
N ↓
Responsiveness



IDLE → 0%

NON IDLE → 15%, 13%.

↳ mean anything is working in CPU.

* When we load program, it comes from harddisk and CPU executes it in RAM. It will put all processes into the RAM.

→ P₁ will be executed first before it executes the next P₂
→ Process runs in sequence.

→ when process stops → then CPU will be in IDLE state.

→ further, if P₁ asks for an input or output interrupt, P₂ process will start to execute until P₁ input/ has not been completed.
output process.

→ main obj to avoid idleness



Date: _____

① Multitasking / Time sharing :-

- e.g. we have 6 processes in RAM. It gives 10 seconds to every process. If in 10 sec P_1 is completed then it goes to P_2 and so on.
- If in 6 second P_1 completed and 4 second remaining will not be enough then it will go to P_2 and so on. It will come back after all 6-processes will be completed.
- As you are allocating ^{some} time to all processes. So it gives responsiveness to all processes.
- Preemptive :- Will allocate a certain time for a process. If the process, P_1 is completed then it is good else this process will be rescheduled in the future like a "round robin approach". It will process P_2 for same time, then P_3 and soon, P_6 then it will come back to P_1 .

What is the advantage of Multitasking ? :

↳ Internet



wait for input from user.

Start ↓ 40 msec

CPU processing

↓
stop

10 msec

40 msec CPU is idle.

$$\frac{\text{CPU Time} \times 100}{\text{Total Time}} = \text{CPU Utilization}$$

$$40 + 10 = 50 \text{ msec}$$

↓
Total

CPU wastage

$$\text{CPU Utilization} = \frac{10}{50} = 20\% \rightarrow \text{it means } 80\% \text{ goes in idle.}$$

* CPU is not efficiently used if utilization is ~~more~~ poor

If you think 50% ←

↳ Probability is = to more than

below 50% ↳

then it is good, but if less than

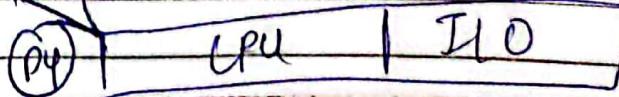
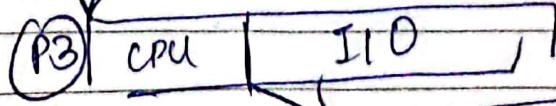
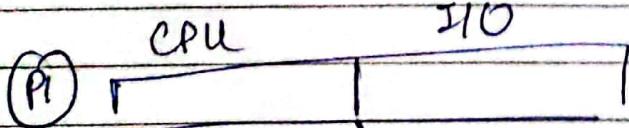
50%, then utilization is poor.

$$\text{CPU wastage} = \frac{\text{I/O Time} \times 100}{\text{Total Time}}$$

state I/O ↑ CPU ↗

$$\text{CPU wastage} = \frac{40}{50} = 80\%$$

CPU time (P1) ↓ ↗ I/O
↳ start (P2) ↗
↳ low & in idle ↗



Date: _____

$$\text{CPU Utilization} = \frac{30}{36} \times 100 = 83\%$$

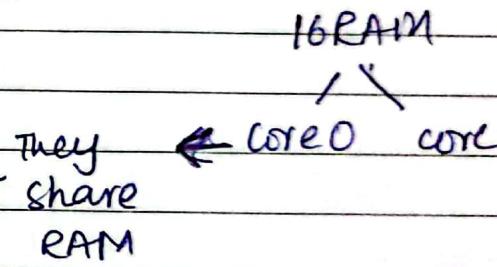
$$\text{CPU wastage} = \frac{6}{36} \times 100 = 16.666\%.$$

OR

$$100\% - 83.33\% = 16.666\%.$$

Multi processing: more than one CPU.

- more reliable and fast
- the speed ratio with N-processors is not N, but less than N. When multiple processors process the tasks, then many overheads are to be catered in order to keep the process working correctly, so this catering of overheads lower the expected result.

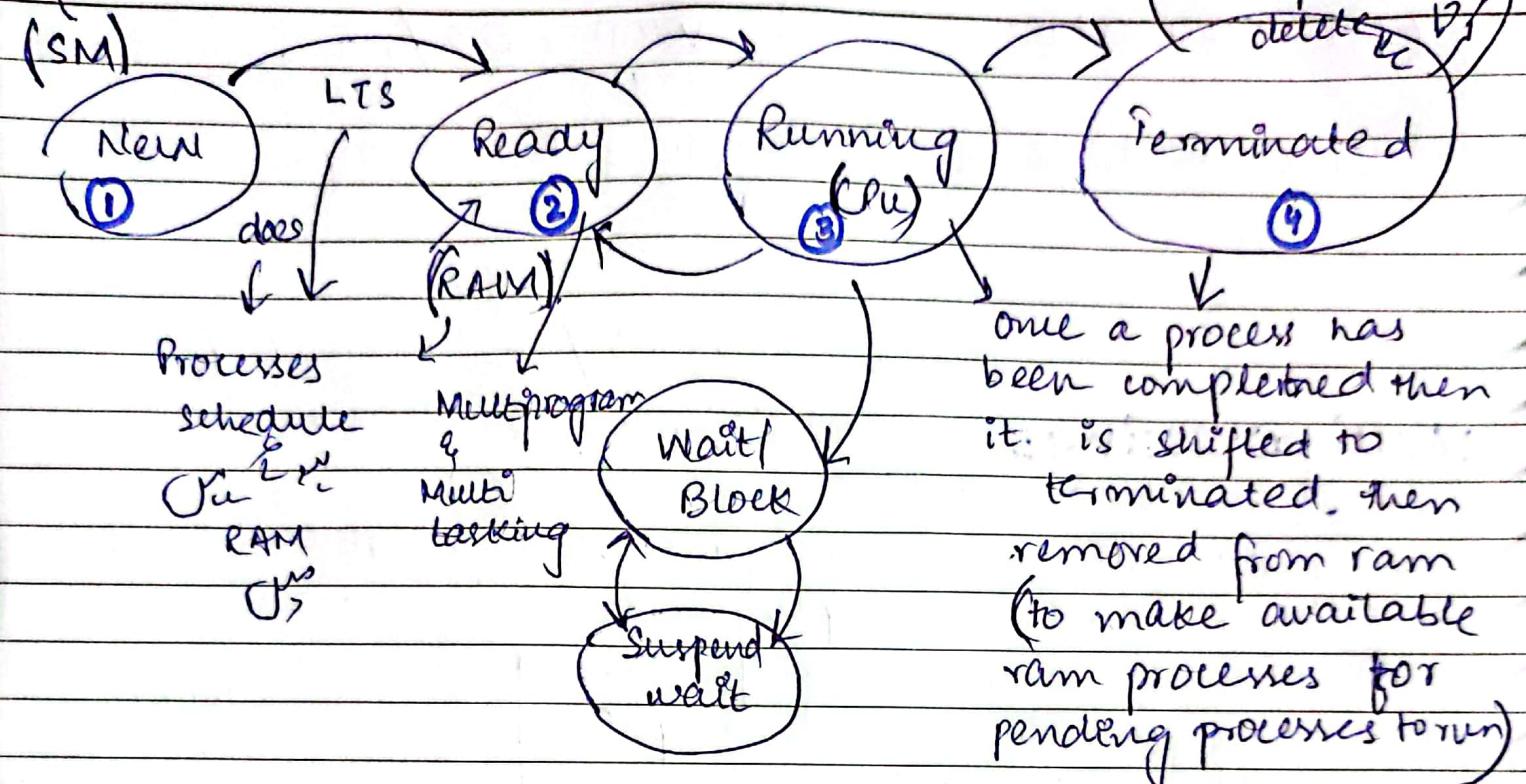


1-processor → crash then
2-processor will work

Secondary memory.
OS Processes:

there could be
left (7)

RAM - 10¹⁵
Data: RAM se process
delete



→ L processes are puted into the Ready state through LTS, but there is limitation of size, so one at a time

LTS - long term scheduler.

→ What is the difference b/w Multiprogram memory and Multitasking?

→ What does Multoprogrammed

does

In which condition multiprogramming approach shift to the next process



Total time = 45

Assignment

Date: _____

$$P_1 = 5 + 4 = 9$$

$$P_2 = 4 + 5 = 9$$

$$P_3 = 5$$

$$P_4 = 5$$

$$P_5 = 5$$

$$\text{CPU utilization} = \frac{33}{45} \times 100 = 73.3333\%$$

$$\text{CPU wastage} = \frac{\frac{45}{12}}{45} \times 100 = 26.666\%.$$

OR

$$\text{CPU wastage} = \frac{12}{45} = 0.33 \div 12 \checkmark$$

LAB (3)

ls → list files
cd Desktop (enter)

pwd (enter) backward path to ↗ (yourself)

* asterisk → wild card

ls *.* → (shows all files and list)
ls *.txt → (one file list).

man ls → (to see all commands)

man cd →

cd ~ (Directory home) → straight it goes to Desktop

and then pwd it shows that file



To

→ make directory

Date: _____

mk dir Samreena press enter
ls " "

Shows

All Desktop folders.

Remove directory

→ rm dir Samreena "

It will delete the directory.

→ ls (-a) → shows all hidden files.

wd → Present Working Directory. (gives path of the present folder)

ls → lists → to see if that file in list exist or not.

To go back only one directory back we

use cd ..

cd ..

VS

cd ~

↳ back one directory

↳ back to Desktop Home

To locate folder file
→ locate name

→ locate Samreena



Multiple file deletion.

file ① ② ③

rm out.txt Samreena my2

Date: _____

It will delete all written files.

Finding Documentation → man.

rm *.* → it will delete all files in folder.
but not folder.