2CB3CS50

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12 01 2024

Test -1

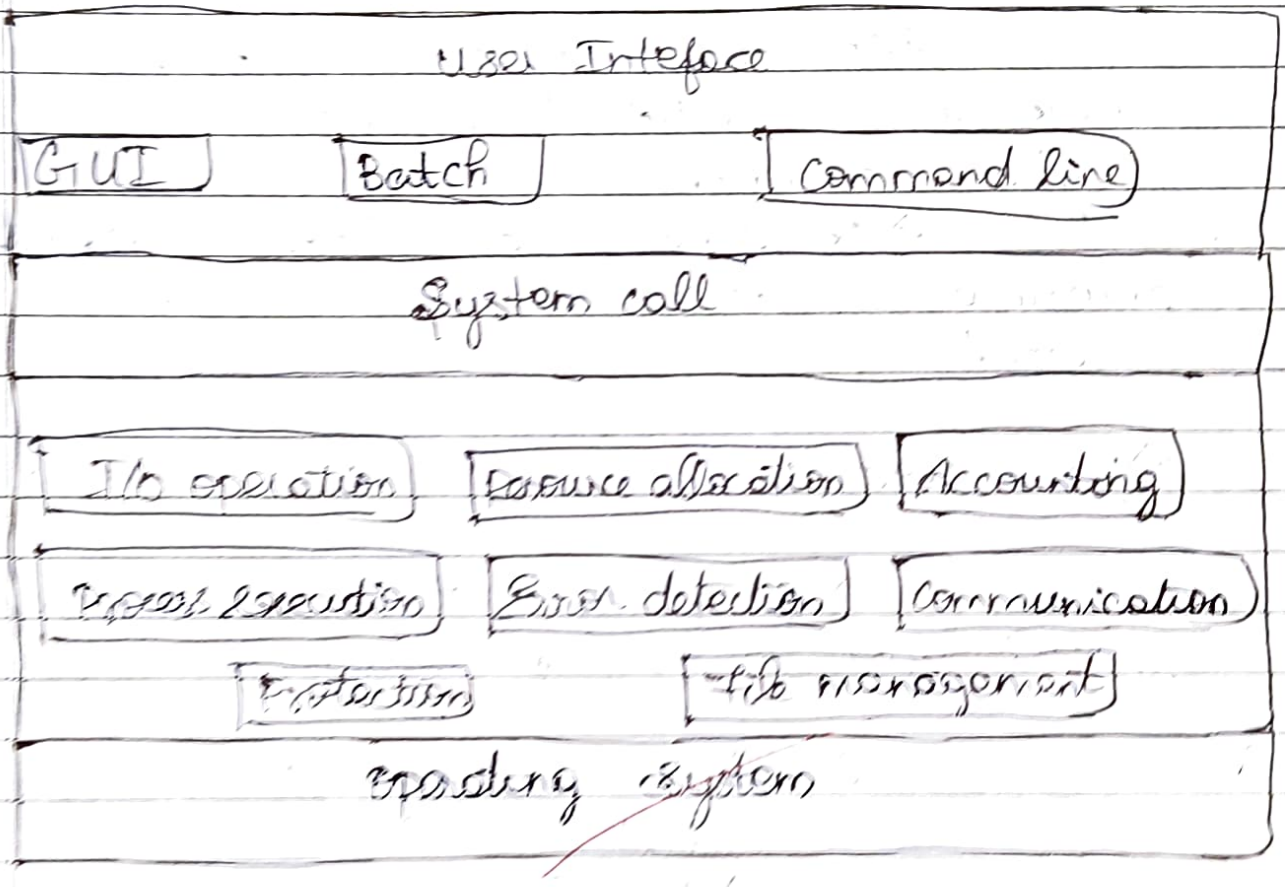
Module-1

1)

a) Operating System

Operating system is the system software which intermediates between hardware and user interface.

Services of operating system



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i) Resource allocation

*) Resource allocation is the main service provided by operating system

*) Resource like memory, CPU, I/o operations, time sharing etc... are divided & allocated to the process in need by the operating system

ii) Error detection:

*) Operating systems helps the computer to detect error occuring in program execution

*) Operating System helps in detecting the specific point where error is created.

iii) User Interface:

*) OS provides the user interface to the user to perform properly.

*) Three kinds of UI are there:
   i) GUI
   ii) Batch
   iii) Command line user.

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i) GUI:

Graphical User Interface is used in windows where there is an pointing dject to access the user interface.

ii) Batch:

commands and files are saved and compiled to execute the process.

iii) Command line user:

Commands line user Interface asks commands from the user in one line to perform the task.

iv) Accounting

*) Operating system keeps track of all the process happening in the computer for billing purpose or any kind of future reference.

v) Communication

*) operating system helps in communication between various parts and processes for resource sharing

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vi) I/O operations

*) Operating system helps in transfer of data between Memory and Input/output devices and CPU.

vii) Process execution

*) OS helps in the execution of of the process using proper system calls.

viii) File management.

*) OS helps in creating or destroying files.

*) Read or write files.

*) To store files.

ix) Protection & Security

*) One of the most important thing is to give proper protection for the data and programs under execution.

*) OS helps in giving protection & security to the system.

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1) b)

i) Multiprocessor System

*) Multiprocessor system is formed by the more the 1 CPU or processor.

*) Multiprocessor systems

Multiprocessor system	Clustered system.
*) Multiprocessor system is formed by 2 or more CPU or processor connected together.	*) Clustered system is formed by connecting 2 or more computers together.
*) High performance due to the presence of many processors	*) Many computers are connected to common terminal so sharing of resource is easy.
*) Assymetric: Master/slave model *) One CPU will act as a head mastering all other CPUs. The rest CPUs work according to the master.	*) Assymetric: *) one computer monitor all other computers. *) when any computer stops working, the main computer work as that computer and becomes active

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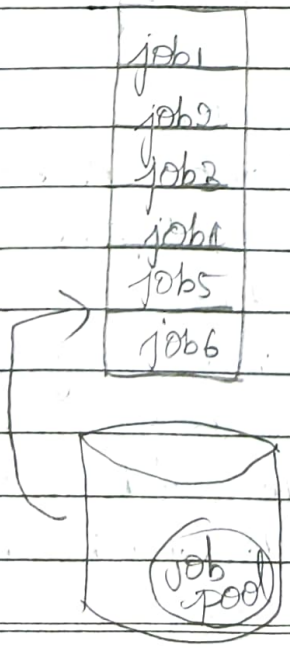
*) Symmetric	*) Symmetric
All the CPU work together sharing the work.	All the computers work together by sharing the work.
*) Economical profit As it avoids construction of many computer by having many processor.	*) Comparatively cost is high.

ii) Multiprogramming	Multitasking
*) In multiprogramming, all the jobs in the job pool are arranged in memory one after the other for execution	*) Different tasks executed by the CPU are changed frequently that they appear like many tasks are executing at the same time



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*) Always keeps the CPU in working mode by assigning the task in order.	*) Many tasks are executed frequently that made the user to think all are executing at the same time.
*) When I/O operation are taking place, this won't make the CPU sit idle by giving the next job in the order and so on.	*) High performance rate and fast execution.
*) Increase the usage of CPU properly.	*) Reduces the time of execution of the process

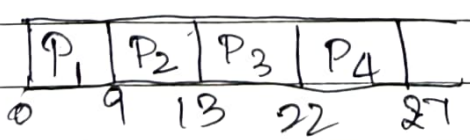
Module-2

1) FCFS

a)

Process	AT	BT	CT	TAT	WT
P_1	0	9	9	9	0
P_2	1	4	13	12	8
P_3	2	9	22	20	11
P_4	3	5	27	24	19
				Avg: 16	9.5

Gantt chart



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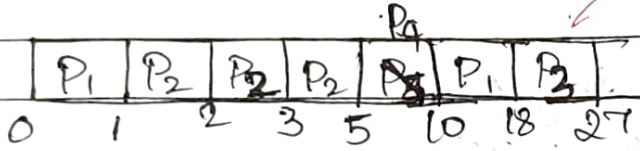
SRTF → Preemptive

Process	AT	BT	CT	TAT	WT
P_1	0	9 8	18	18	9
P_2	1	4 3 2 0	5	4	0
P_3	2	9	27	25	16
P_4	3	5	10	7	2
			Avg	13.5	6.75

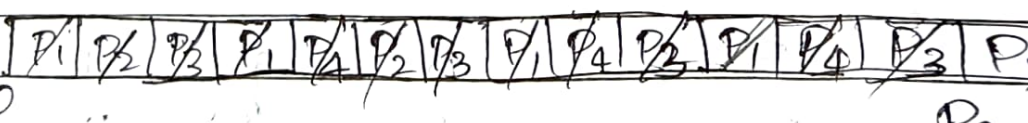
Grantt



RR → Q = 2ms.

Process	AT	BT	CT	TAT	WT
P_1	0	9 7 5 3 1	26	26	17
P_2	1	4 2	12	11	7
P_3	2	9 7 5 3,	27	25	16
P_4	3	5 3 1	23	20	15
			Avg	20.5	13.75

Ready Queue



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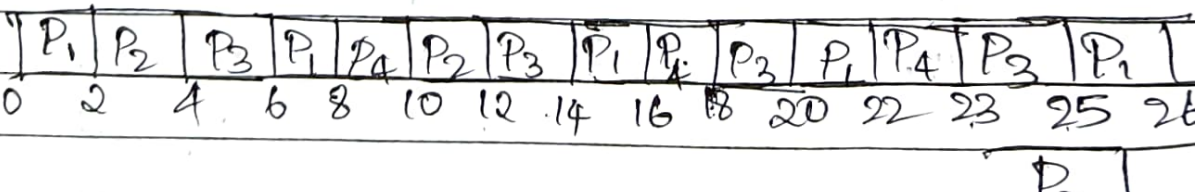

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Priority Low → High P

Prio	Pro	AT	BT	CT	TAT	WT
3	P_1	0	9	22	22	13
2	P_2	1	3	14	13	9
1	P_3	2	8	11	9	0
4	P_4	3	5	27	24	19
					17	10.25.

Gantt

P_1	P_2	P_3	P_3	P_2	P_1	P_4

0 1 2 3 11 14 22 27

b)

Process	Threads.
A collection of threads are there in a process	Thread is a basic unit of process.
Process is the execution of a program as a whole	thread is the execution of a particular block or line.

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1) a) fork

2) b) when process is sheduld to run after some execution

3) b) communication b/w two process

4) b) program counter

5) b) 5