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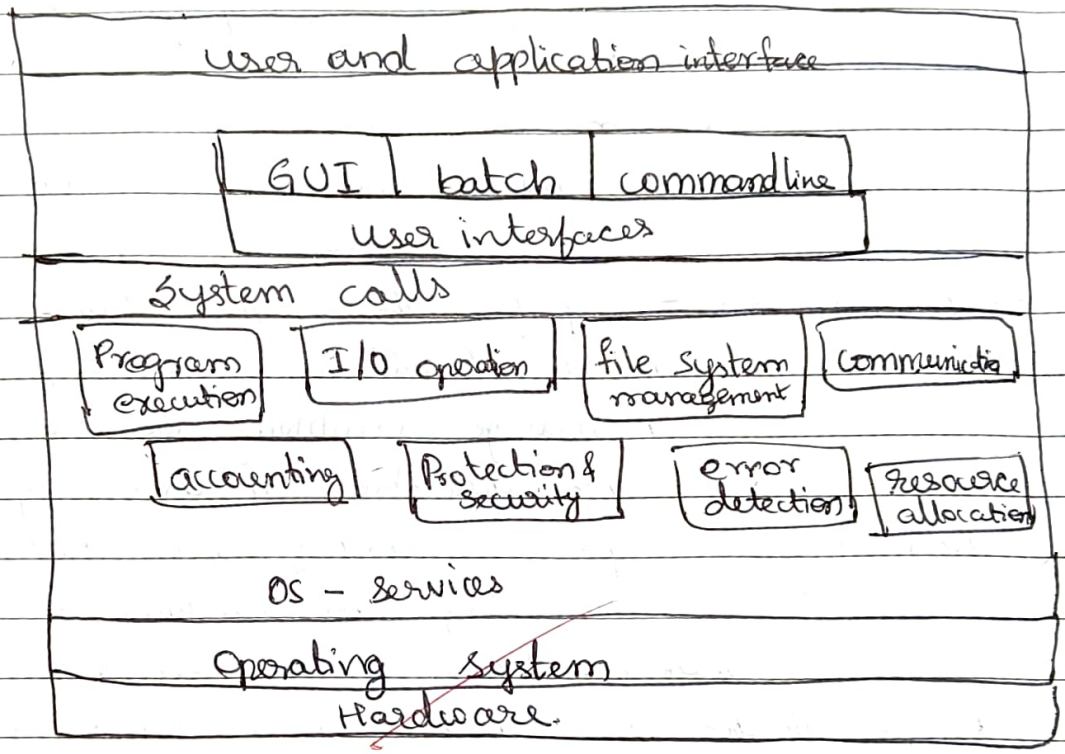
Test-1

1. (a) Operating System -

Operating System is the interface between the user and the hardware of the computer system.



The operating system provides various services to the user.-
It provides user interfaces like

GUI → Graphical user interface - it is a pointer mouse-menu based system which helps in providing commands to the computer.

Commandline → These are single commands (like sh, tcsh etc.) given to the terminal to perform various tasks.

batch user interface → In this the commands and the tasks performed by these commands are written in a file and this file is executed to perform required task.

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→ program execution – The OS performs program execution by performing tasks such as creating and terminating a process, applying wait calls etc.

→ I/O operations – The OS acts as interface and collects information in form of input from the keyboard and performs output operation by displaying on the monitor.

→ file system management –
OS handles files and performs various file operations such as creating, opening, reading, writing, closing or deleting a file.

→ Communication – It performs the communication task by connecting / terminating a device, sending / receiving a message, identifying the message and generating appropriate response etc.

→ Accounting – OS keeps the record of various tasks performed and also the billing and maintaing records can be used in future as and when required.

→ Resource allocation – The resource required for the process is identified and allocated to that process. After the process is completed, deallocation of resource takes place. If the resource is not available, process is set to waiting condition. The resources may be the data required for processing, memory, storage, external devices like printer etc.

→ Error detection – OS detects and handles various types of both hardware & software errors. Hardware errors like power failure / system failure, I/O errors like network connectivity and software errors like Logical error in execution of a program etc. are handled.

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→ protection & security - Protection & security is provided to the system from external network by using passwords & specifying authority over a particular resource or files to prevent ~~data~~ improper use of data.

~~(iii)~~ System calls provide commands to access these services of the operating system.

1.(b) (i) Multi-processor system

→ It is a system that contains more than one processor
→ It has one system with multiple processor
→ ~~One task is done~~
→ Tasks are performed one after the other
→ Slower compared to clustered system
→ Inter process communication is compaitively easy

Clustered system.

→ It is a collection of various systems together.
→ It has multiple ~~pro~~ systems with multiple processor.
→ Simultaneous performance of tasks is done.
→ It is faster
→ Interprocess communication difficult.

(ii) Multiprogramming

→ Multiple programs are given to the main memory so that the CPU does not remain idle
→ It is slower
→ It is based on the concept of context switching
→ Processes are performed one after another

Multitasking

→ Simultaneous performance of tasks happens in the same processor.
→ It is faster
→ It is based on the concept of time sharing
→ Processes are performed simultaneously.

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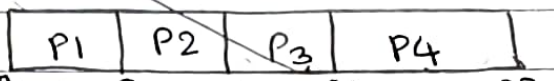
4(a)

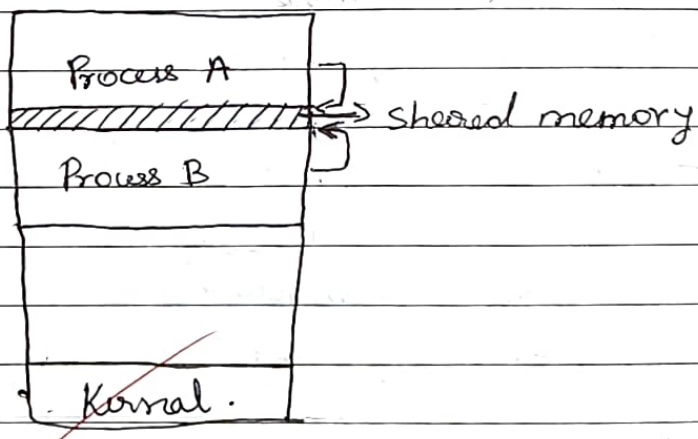
Process	AT	BT	CT	WT	TAT
P1	0	9	9	0	9
P2	1	4	13	9	
P3	2	9	22		
P4	3	5	27		

FCFS Gantt chart



3(a) Inter process communication – The communication between 2 process is known as inter process communication (IPC). Inter process communication can happen in 2 types message passing & shared memory. This happens due to Co-operative processes.

Shared Memory –



The shared memory happens without the message being passed to the Kernel.
In this the information to be shared is stored in common memory that can be access by all the process that needs some information for the performance of task.
This is fast and the information is shared efficiently.

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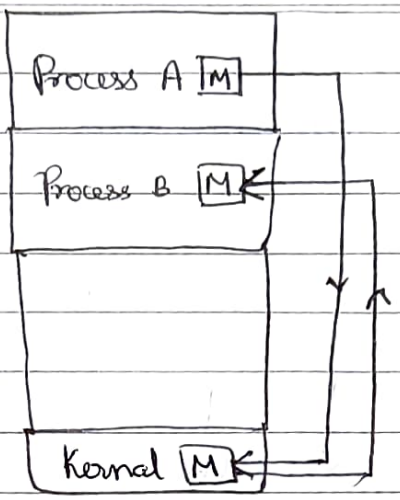
Message Passing –



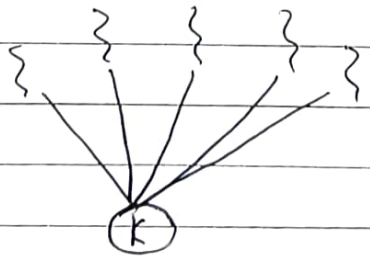
This happens when a process depend on the informatio generated by another process.
Kernal acts a channel for the message to be passed.
The message from the process A is first sent to kernal and then the kernal sends this message to process B.
It is comparitively slower.
Authority of access to the message should be given, Therefore it is safe way of sharing messages.

3(b) Different Multi-threading models –

→ Many to one
→ One to one
→ Many to many.

There are 2 types of threadings → User threads & Kernal threads.

• Many to one:



- In this many user threads are connected to one kernel thread.
- This helps in better communication b/w the threads.

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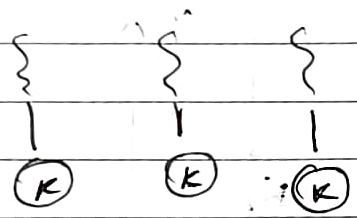
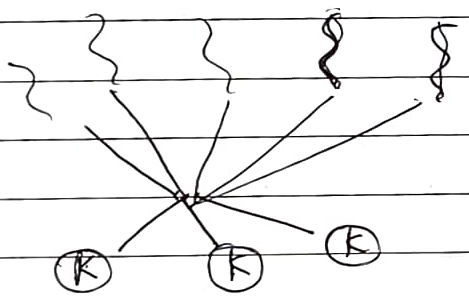
* But if one thread calls a blocking system call, the whole system fails and is blocked.

- One to One -



* In this ~~case~~ each thread is connected to a different kernal.
* Therefore ~~&~~ even if one thread calls blocking system call, the system continues
* But creation of one kernal is necessary for each user thread and this is a difficult procss.

- Many to Many



* In this, many user threds are connected to many lesser kernal threads.
* Even if one of the thread calls blocking system call, the threads continue to work through other kernals
* And creation of a different kernal for each user thread is not necessary

Therefore it overcomes the disadvantage of many to one as well as one to one multithreading models.

Quiz

1. (a) fork
2. (a) Process is scheduled to run after some execution
3. (b) communication b/w 2 processes
4. (b) Program counter
5. ~~(b)~~ (a) 4.