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OS (KCS 401)
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Part - A

1) Batch operating System -:

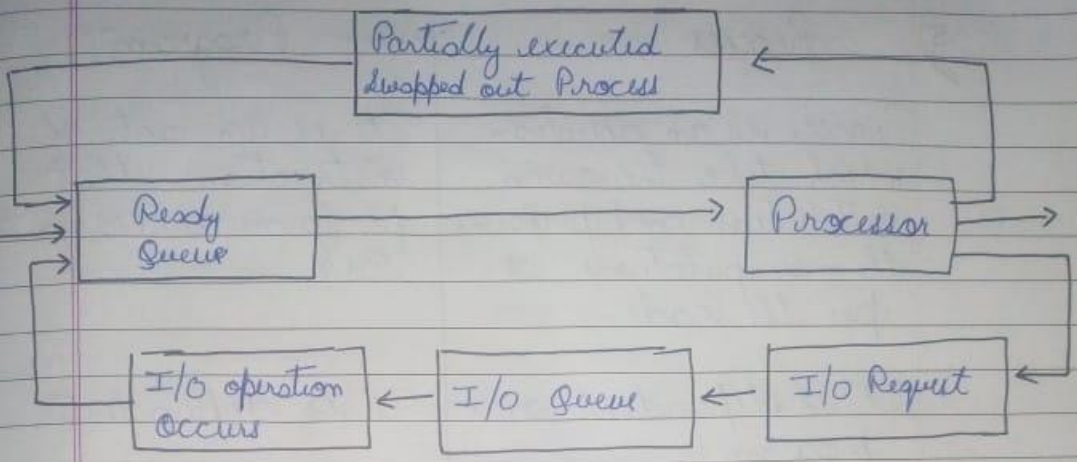
Advantages -:

Batch system can be shared by multiple users.
There is very less idle time for batch system
It enable us to manage the efficiently large load of work.

Dissdvantages -:

It is very difficult to debug the batch system.
It is costly sometimes
If any job fails, then it is difficult to predict the time.

2) Time sharing System -: Time sharing System, in data processing is method of operation in which different program interact nearly simultaneously with the CPU of a large scale digital computer.



4) Throughput :- The number of processes that are completed per unit time is called the throughput.

It is desirable to maximize CPU utilization and throughput and to minimize turn around time and response time.

Response time :- This is a time difference b/t submission of a request until the response begin to be received.

The response time should be as low as possible so that a large no. of interactive users receive an acceptable response time.

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3) There are 3 types of schedulers available:-

Long term Scheduler:- Long term scheduler is also known as job scheduler.

It chooses the processes from the pool (secondary memory) and keeps them ready queue maintained in the primary memory.

Short term Scheduler:-

Short term scheduler is also known as CPU scheduler.

It selects one of the jobs from the ready queue and dispatch to the CPU for the execution.

Medium term Scheduler:-

Medium term scheduler takes care of the swapped out processes.

If the running state processes needs some IO time for the completion there is a need to change its state from running to waiting.

5)

Process	Program
Process is an operation which takes the given instruction and performs the manipulations as per the code.	It is an act of instruction that perform a designated task.
It is dependent on a program.	It is dependent
Process is a module that executes concurrently	Perform task directly relating to an operation
includes counter, stack, heap	It is a set of instruction
Active entity	Passive entity

Part-B

7) Layered structure of OS :-

The operating system is divided into a no. of layers (levels) each build on top of lower layers.
The bottom layer is the hardware, the highest layer (layer(N)) is the user interface

With modularity layers are selected such that each uses functions (operations) and services of only lower-level layers.

The main advantage of the layered approach is simplicity of construction and debugging.

The layer are selected so that each uses functions and services of only lower-level layers.

The major difficulty with the layered approach involves appropriately defining the various layers.

9) Major functions and services of an operating system :-

* Program execution :-
  - The purpose of computer system is to allow the user to execute program in an efficient manner.
  - The O.S provides an environment where the user can conveniently run these programs.

* I/O operations :-
  - Each program requires an input and after processing the input submitted by user it produces output.
  - This involves the use of I/O devices.

* File system manipulation :-
  - While working on the computer, generally a user is required to manipulate various types of files like opening a file, saving a file and deleting a file from the storage disk.
  - This is an important task that is also performed by the operating system.

* Communication :-
  O.S performs the communication among various types of processes in the form of shared memory.

* Error detection :-
  - The main function of O.S is to detect the error like bad sectors on hard disk, memory overflow and errors related I/O devices.
  - After detecting the errors, O.S takes an appropriate action for consistent computing

* Resource allocation

* Protection and security

8) ~~Ready~~ Job queue :-

- In starting, all the processes get stored in the job queue.
- It is maintained in the secondary memory.
- The long term scheduler (Job scheduler) picks some of the jobs and put them in primary memory.

Ready queue :-

- Ready queue is maintained in primary queue.
- The short term scheduler picks the job from the ready queue and dispatch to the CPU for the execution.

Device queue:-
When the process needs some I/O operating in order its complete its execution, OS changes the state of the process from running to waiting

Part - C

11)

a) Monolithic Kernel

Kernel size is large

O.S is complex to design

All the operating system services are included in the kernel.

Request are served faster

Microkernel

Kernel size is small.

O.S is easy to design, implement and install.

Kernel provides only IPC and low level device management.

Slower request is served.

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Multiprogramming	Multi user system
It keeps several program in main memory at the same time and executes them concurrently utilizing single CPU.	It allows multiple user to access the single system with one O.S in it.
It utilizes single CPU.	It is used on large mainframe computer.
less expensive	More expensive
Less efficient time	More efficient time.