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Subject # Operating System

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Q.no. (2)

Ans :- Deadlock with one process is not possible.

Here is it explanation:

A deadlock situation can arise if the following four condition hold simultaneously in a system

- mutual Exclusion
- Hold and wait
- No preemption
- Circular_wait

it is not possible to have a circular wait with only one process thus failing a necessary condition for circular wait. There is no second process to form a circle with the first one. So it is not possible to have a deadlock involving only one process.

Qno3: (3) :-

Ans :- Suppose the System is deadlocked This implies that each process is holding one resource and is waiting for one more. Since there are three processes and four resources one process must be able to obtain two Resources. This process requires no more Resources and therefore it will Returns its Resources when Done.

Qno(5) (5)

Ans :-

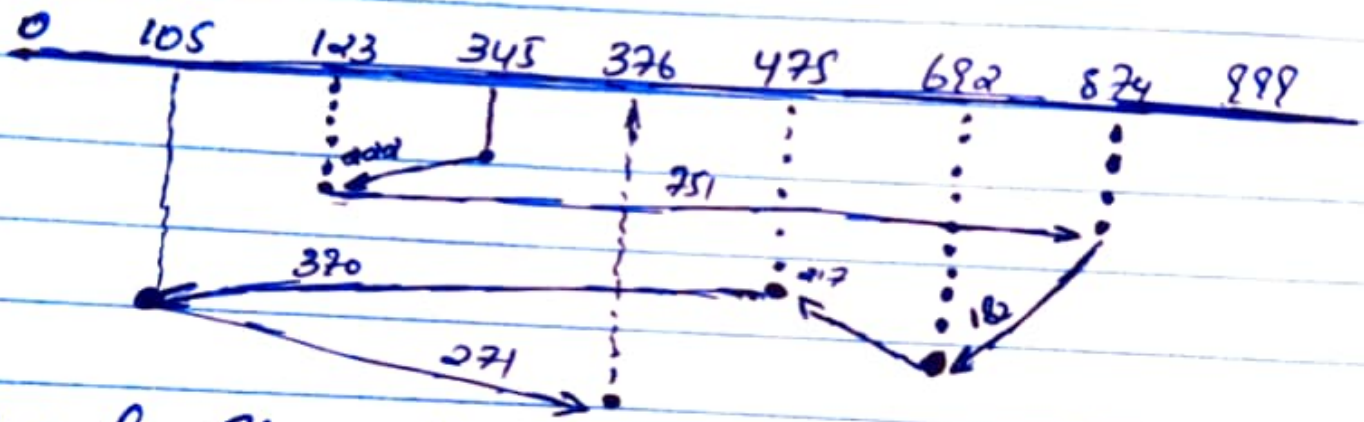
Detection of starvation requires future Knowledge Since no amount of record keeping Statistics on processes Can determine if it is making 'Progress' or not. However, Starvation Can be prevented by 'aging' a process. This mean maintaining a rollback Count for each process and including this as part of the Cost factor in the Selection. process for a victim for preemption / roll back.

Ans :-

Disk Scheduling Algorithms:

(1) :- FCFS :-

FCFS is the simplest of all the disk Scheduling Algorithms. In FCFS, the requests are addressed in the order they arrive in the disk queue.



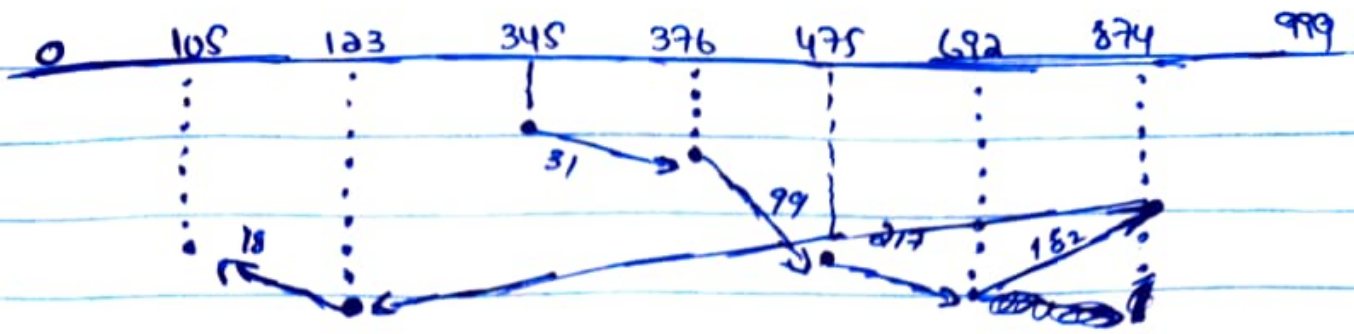
Total R/w Head movement :-

222 + 751 + 182 + 217 + 370 + 271 = 2013

(2) :-

SSTF :-

In SSTF (Shortest Seek Time first) request having Shortest seek time ~~of request~~ are executed first. So the seek time of every request is calculated in advance in queue and then they are scheduled according to their calculated seek time.



Total Rlw Head movement :-

$31 + 99 + 182 + 217 + 182 + 751 + 18 = 1298$

Qno1 — (1)

Ans :- Deadlock :-

Deadlock is a Situation where a set of processes are blocked because each process is holding a resource and waiting for an other resource acquired by some other process

Consider an example :- when two trains are coming toward each other on same track and there is only one track none of the train can move once they are infront of each other Similarly Situation occurs in operating Sysystem.

Necessary Condition :-

There are fours Condition that are necessary to achieve deadlock.

(i) mutual Exclusion:-
At least once resource must be held in a non Sharable mode: if any other process requests their resources, then that process must wait for the resource to be released.

(ii) Hold & wait. A process must be simultaneously holding at least one resources and waiting for at least one resource that is currently being held by some other process

(iii) No-preemption:
once a process is holding a resource (i.e once its request has been granted) ~~then its request had~~ then that resource cannot be taken away from that process until the process voluntarily release it.

(iv) Circular wait:
A set of process {P0, P1, P2 ... Pn} must exist such that every P[i] is waiting for P[i+1 % (N+1)] (note that this condition implied the hold and wait condition.

Q.no (4) — (4)

Ans:- Resource Allocation Graph:-

The Resource allocation Graph is the pictorial representation of the state of the System. As its name Suggest, the Resource Allocation Graph is the Complete information about all the Processes which are holding Some resource and waiting for Some Resource.

it also Contains the information about the all the instances of all resources whether they are available or being used by the Processes.

In Resource allocation graph the Process is represented by a a circle while the Resource is represent by a rectangle

Vertices:- Vertices are mainly of two types Resource and process each of them will be represented by a diffrent Shape. circle represent process while rectangle represent resource.

Edges:- Edges are also of two types, one represents assignments and other represent the wait of process for a resource. The above image each Show of them.

A process is Shown as waiting for resource if the tail of an arrow is attached to the process.