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Subject: Operating System

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Date: 11/7/2020

Q1 Explain the necessary condition that may lead to a deadlock situation. What are the various method for handling deadlocks?

Ans1 The four necessary condition for a deadlocks to exist are mutual exclusion condition, wait for condition no preemption condition and circular wait condition.

(2) Various methods for handling deadlocks?

(1) A deadlocks can be handled in several ways.

(i) We can use specific ~~prob~~ protocols to prevent or avoid deadlocks so that a system may never enter a deadlocks state.

(2) We can detect the deadlocks and recover it.

(3) We can totally ignore the deadlocks problem.

Q2 Is it possible to have a deadlocks involving only one single process?

Ans2 No. this follows directly from the hold-and-wait condition.

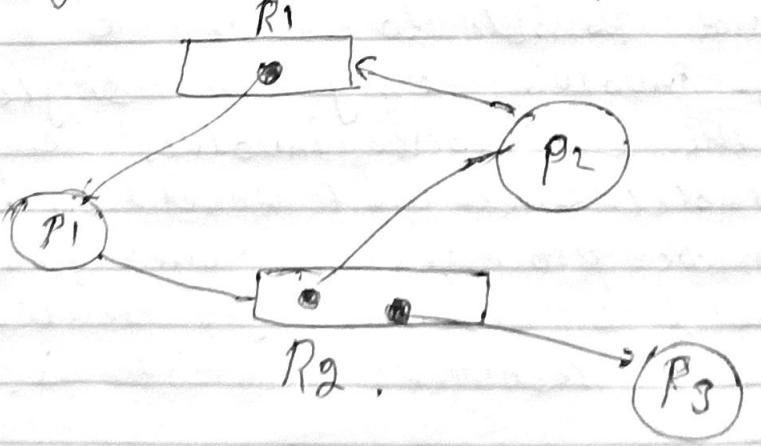
It is not possible to have a deadlocks involving only one single process. The deadlocks involves a circular 'hold-and-wait condition between two or more processes. So 'one' process cannot hold a resource 'yet be waiting for another resource that it is holding.

Q3 A system consists of four resources of same type that are shared by three process. Each process needs at most two resources. Show that the system is deadlock-free.

Ans3 Suppose the system is deadlocked. This implies that each process is holding one resources and is waiting for one more. Since there are three processes and four resources, on processes must be able to obtain two resources. This process requires no more resources and therefore it will return its resources when done.

Q4 What is a resources allocation graph? How do you obtain a wait-for graph from it. Explain their uses?

Ans The resource allocation graph is the pictorial representation of the state of a system. As its name suggests. The resource allocation graph is the complete information about all the processes which are holding some resources or waiting for some resources. Vertices are mainly of two types, Resource and process.



05 Can a system detect that some of its process are starving? if you answer "yes" explain how it can if you answer "No" explain how the system can deal with the starvation problem.

Ans5 Detection of starvation in effect 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 means maintaining a rollbacks count for each process and including this as part of the cost factor in the selection process for a victim for preemption/ roll backs.

06 The FIFO schedule is
345, 123, 874, 692, 475, 105, and 376.
Total head movement = (345-123)+(874-123)
+(874-692)+(692-475)+(475-105)+(376-105)
= 2013

SSTF.

The SSTF schedule is
345, 376, 475, & 692, 874, 123, and 105,
Total head movement =
= (376-345)+(475-376)+(692-475)+(847-692)
+(874-123)+(123-105) = 1298.

SCAN.

345, 123, 105, 0, 376, 475, 692, and 874.
Total head movement = (345-123)+(123-105)
+(105-0)+(0-376)+(376-475)+(475-692)+
(692-874 = 1219.