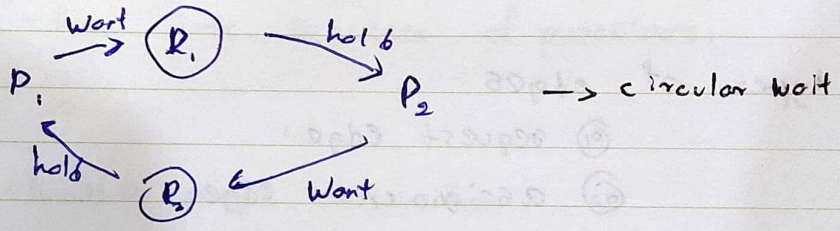
Deadlocks

SOS lec 7

- deadlock mean your system is stuck and not responding.

- Several processes ~~who~~ use resources and some of them may wait for the resource forever



→ circular wait

When modeling system resources can be,

(01) Identical
(02) Pre-mptible
(03) non-preemptible.

each process

(01) request
(02) use
(03) release , resources.

Conditions to occur a deadlock. (4)

(01) Mutual exclusion
(02) Hold & Wait condition
(03) No-pre-emption Condition
(04) Circular wait Condition.

Deadlock modeling.

- Can be described using a directed graph. also called System - resource - allocation graph.

- Vertices
- Edges → G (V, E)

2 type of vertices

(01) processes
(02) resources.

2 types of edges

(01) request edges
(02) assignment edges

3 Methods of handling a deadlock.

(01) ignore the problem and assume no deadlock will happen. (ostrich algorithm)

(02) use a protocol to detect deadlocks and ensure system will never reach deadlock.

(03) Allow system to enter a deadlock state and recover.

(01) deadlock Prevention.

- going to deniede one of any deadlock Conditions which likly to occur a deadlock.

1. Deny mutual exclusion. (cant avoid)
2. Hold and wait (cant avoid) - Deny

03. allow pre-emption

04. Deny circular wait.

(02) deadlock avoidance.

- need some aditional info about resources and give to OS.

Safe state - if the System has enough resources to accomade to process then System is in Safe state.
- have safe sequence of processes.

(03) resource allocation graph algorithm.

- have 3 type of edges.
  - Claim edge
  - request edge
  - assignment edge

Claim - edges dashed line

Banker's algorithem.

- We can have multiple resources and check System will in Safe State or not.

Date No

Resource - request algorithm.

- used to determine the request can be safely granted or not

- Compare request with available, and with need. if pass it its in safe state and can allocated to it.

(04) Deadlock detection.

→ for recover from deadlock we need to identify deadlock

- need to maintain wait for graph. and have to look for circle waits.

resource allocation graph can converted to wait-for graph.

after detect deolock have to recover

Deadlock recovery.

(01) Terminate processes

(02) pre-empt a resource from a process - (Terminate or remove resources from processes)