Operating System and System Administration

Tutorial 08

Year 02 Semester 01

Department of Information Technology, Faculty of Computing

1) List one example of deadlocks that are not related to a computer system environment.

2) List the three strategies in handling deadlocks.

3) List four necessary conditions to have a deadlock in a system.

4) Describe one protocol of a deadlock prevention algorithm that breaks the circular wait condition.

5) Deadlock detection can be implemented using wait for graph.

   a) Why do we need the wait for graph instead of Resource Allocation Graph for deadlock detection?

   b) Briefly explain how the system detects the deadlock in a system using the wait for graph.

   c) What is the limitation of the wait for graph when it used for deadlock detection?

   d) Briefly explain a deadlock detection method that solves the above limitation in part (c).

   e) Once a deadlock is detected in a system, how does the system recover from the deadlock? Briefly explain your answer.

   f) A system may invoke a deadlock detection algorithm for every resource request. State one advantage and one disadvantage of such a system?

6) Consider a system with the following resource types:

A: Tape drives (4 units)

B: Plotters (2 units)

C: Printers (3 units)

D: CD ROMs (1 unit)

At time t, there are three processes with the following information for their resource allocations and additional resource requests:

Process P1: allocation - one printer, additional requests – two tape drives and one CD ROM

Process P2: allocation - two tape drives and a CD ROM, additional requests –one tape drive and one printer

Process P3: allocation - a plotter and two printers, additional request - one tape drive, and one plotter

a) At time *t* what is the contents of *Allocation*, *Max*, *Available*, and *Need* matrices?

b) Is the system safe?

c) If process P1 requests for one tape drive, should the request be granted?