



Operating System and System Administration

Tutorial 06

Year 02 Semester 01 2022

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?