Zagazig University
Faculty of Engineering
Computer and Systems Dept.

Spring 2020
Third Year
CSE325: Operating Systems

Discussion #7

Covers: Chapter 8

Questions:

1. What are the four necessary conditions for a deadlock to happen?
2. Draw a resource allocation graph that does not have any cycles.
3. Draw a resource allocation graph that have a cycle but no deadlock.
4. Draw a resource allocation graph that have a cycle and a deadlock.
5. What are the different possible methods for dealing with deadlock?
6. Consider the following snapshot of a system:

	Allocation				***Max***			
	A	*B*	*C*	*D*	*A*	*B*	*C*	*D*
P0	4	2	1	2	6	3	2	5
P1	3	1	2	1	3	3	2	1
P2	2	2	1	0	3	2	1	1
P3	0	5	1	0	4	6	1	2
P4	3	0	1	4	5	1	1	7

   Using the banker's algorithm, determine whether or not each of the following states is unsafe. If the state is safe, illustrate the order in which the processes may complete. Otherwise, illustrate why the state is unsafe.

   a. Available = (1, 0, 0, 2)
   b. Available = (0, 3, 0, 1)

7. Consider the following snapshot of a system:

	Allocation				***Max***				***Available***			
	A	*B*	*C*	*D*	*A*	*B*	*C*	*D*	*A*	*B*	*C*	*D*
P0	1	3	1	2	1	4	2	4	3	3	2	1
P1	3	1	2	1	5	2	5	2				
P2	1	4	3	2	3	6	6	5				
P3	2	0	0	1	4	2	1	2				
P4	2	1	0	3	2	3	1	6				

   Answer the following questions using the banker's algorithm:

   a. Illustrate that the system is in a safe state by demonstrating an order in which the processes may complete.
   b. If a request from process P1 arrives for (1, 1, 0, 0), can the request be granted immediately?
   c. If a request from process P2 arrives for (0, 0, 2, 0), can the request be granted immediately?