Deadlock home work

1. Consider the following resource allocation graph:

P = {P1, P2, P3, P4}

R = {R1, R2, R3}

E = {R1→; P1, P1 → R2, R2 →P2, P2 → R3,

R3 → P3, P3 → R1, R1 →P4}

- Resource type R1 has two instances

- Resource type R2 has one instance

- Resource type R3 has one instance

Draw a resource allocation graph and explain the possibility for a deadlock.

2. Suppose there are 3 instances of resource tape drives, 3 instances of resource graphics and 2 Instances of resource printers. Process 1 holds one unit of resources of both graphics and printers and is waiting for one unit of tape drives. Process 2 holds two units of tape drives and -0waiting one unit of graphics. Process 3 holds one unit of graphics and one unit of printer. Process 4 holds one unit of tape drive and one unit of graphics and waiting for one unit of printer. Draw the resource allocation graph for the above scenario. Is the system in a deadlocked state? Explain.

3. Assume that there are 4 processes, P1 through P4, and 4 types of resources. At T0 time we have the following system state:

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

    a. Create the need matrix.
    b. Use the safety algorithm to test if the system is in a safe state. If safe find the safe sequence.
    c. If the system is in a safe state, can the following requests be granted, P1 requests (0, 2, 1, 0)

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