UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

DEPARTMENT OF COMPUTER SCIENCE

CSC362: System Programming

Assignment 4 - Total 50 marks

Question 1: Consider the following table and implement Banker's Algorithm:

Given Matrices												
	Allocation Matrix (N0 of the allocated resources By a process)				Max Matrix Max resources that may be used by a process				Available Matrix Not Allocated Resources			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	1	1	0	0	2	1	0	1	5	2	0
P_1	1	2	3	1	1	6	5	2				
P_2	1	3	6	5	2	3	6	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				
Total	2	12	14	12								

First, create the need matrix, then use the safety algorithm to determine if the system is in a safe state or not. Finally, solve to find out the order in which the processes will be executed to ensure that the system is in a safe state.

Question 2: Consider the following snapshot of a system with five processes (P1, P2, P3, P4, P5) and four resources (R1, R2, R3, R4). There are no current outstanding queued unsatisfied requests.

Currently Available Resources

R1	R2	R3	R4
2	1	2	0

	Current Allocation				Max Need				Still Needs			
Process	R1	R2	R3	R4	R1	R2	R3	R4	R1	R2	R3	R4
P1	0	0	1	2	0	0	3	2	0	0	2	0
P2	2	0	0	0	2	7	5	0	0	7	5	0
P3	0	0	3	4	6	6	5	6	6	6	2	2
P4	2	3	5	4	4	3	5	6	2	0	0	2
P5	0	3	3	2	0	6	5	2	0	3	2	0

Is this system currently deadlocked, or can any process become deadlocked? Why or why not? If not deadlocked, give an execution order.