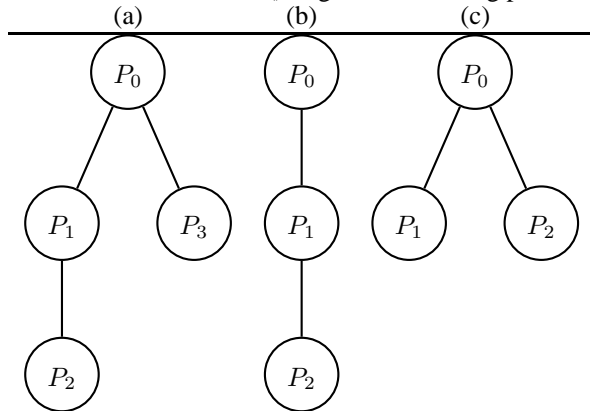


CSE 332 Midterm #1

Olcay Taner YILDIZ

I. QUESTION (15 POINTS)

Write C codes with fork() to get the following process trees:



II. QUESTION (15 POINTS)

Draw the process state diagram and explain states of the process (Example: running) briefly.

III. QUESTION (15 POINTS)

- The disadvantage of first-come first-served scheduling algorithm is the convoy effect. Give an example Gantt chart showing the convoy effect.
- The disadvantage of priority scheduling algorithm is starvation or indefinite blocking. Give an example showing the starvation.
- The disadvantage of round-robin scheduling is, it may increase number of context switches. Give an example showing this.

IV. QUESTION (20 POINTS)

How would you modify the first-come first-served scheduling algorithm if there are two processors available? Show your algorithm given the following arrival and burst times:

Process	Arrival Time	Burst Time
P_1	0	8
P_2	1	3
P_3	2	2
P_4	4	1
P_5	4	3
P_6	10	4

Compare average waiting time of one processor vs. two processors for this case.

V. QUESTION (15 POINTS)

Given four processes, (P_1, P_2, P_3, P_4) and three statements (S_1, S_2, S_3, S_4), where P_i will execute S_i , use semaphores to make the order of execution S_1, S_3, S_4, S_2 . Use at most four semaphores. Show the initial semaphore values.

VI. QUESTION (20 POINTS)

Consider the following snapshot of a system:

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

Answer the following questions using the bankers algorithm:

- Is the system in a safe state?
- If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately?