

Computer Operating Systems

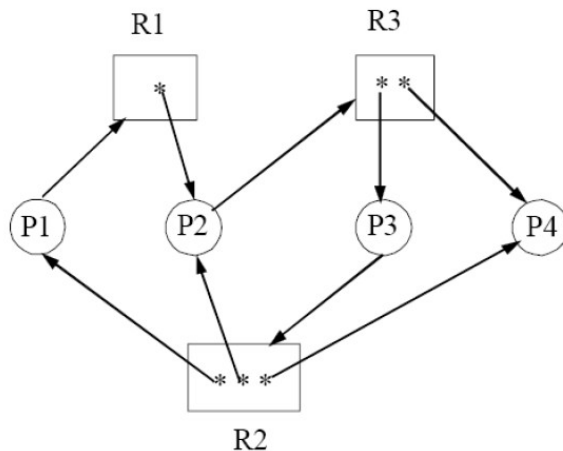
Problem #1

Please answer the following questions.

- Name two ways in which processes on the same processor can communicate with each other. Then explain the two methods.
- What is the difference between multiprogramming and multiprocessing operating systems? Explain the two systems and then the difference.
- From a system performance point of view, adding additional cores (CPU) is not always good. Please show it by introducing the Amdahl's Law.

Problem #2

Is there a deadlock in the system depicted by the following resource allocation graph? Why?



Problem #3

Consider the following set of processes, with the length of the CPU burst time given in milliseconds:

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0. To answer the following questions, consider five CPU scheduling algorithms, First-Come First Served (FCFS), Shortest Job Frist (SJF), Priority Scheduling, and Round Robin (RR). (Hint: drawing Gantt charts will be helpful)

- (a) Which of the schedules results in the minimal average waiting time over all processes? (Your answer must include the calculated average time)
- (b) Which of the schedules allows P5 to complete earlier than the other processes? (Your answer must include the completion time of P5)