

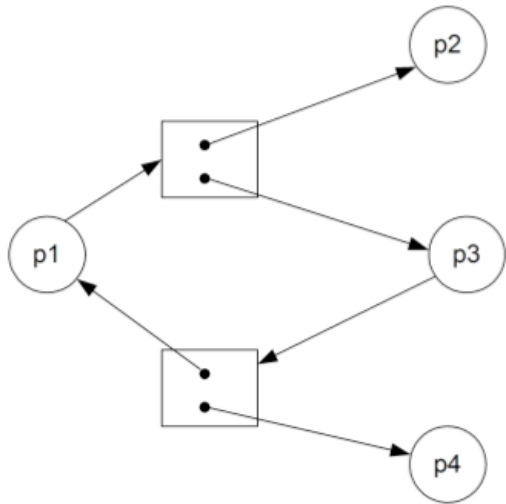
Homework No.3
Due Date: May 12, 2009

1. Given five memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB (in order), how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)? Which algorithm makes the most efficient use of memory? 10 points
2. Explain why implementing synchronization primitives by disabling interrupts is not appropriate in a single-processor system if the synchronization primitives are to be used in user-level programs. 10 points
3. Consider the following situation where there are two processes, P0 and P1, each accessing two semaphores S and Q and initially set the value 1:

P0	P1
	wait(Q);
wait(Q);	wait(S);
:	:
:	:
signal(S);	signal(Q);
signal(Q);	

Will there be a deadlock? If so, modify the code to be a deadlock free. (10 points)

4. Consider the deadlock situation that could occur in the dining-philosophers problem when the philosophers obtain the chopsticks one at a time. Discuss how the four necessary conditions for deadlock indeed hold in this setting. Discuss how deadlocks could be avoided by eliminating any one of the four conditions . 10 points
5. Consider the following resource-allocation graph, identify whether there is a deadlock or not and explain why. 10 points



6. Compare the main memory organization schemes of contiguous-memory allocation, and pure paging with respect to the following issues: 10 point

- external fragmentation
- internal fragmentation

7. Explain how UNIX (Linux) device driver work and describe how VFS handle handing underline implementation of the drivers. 10 points

8. Down load sample4.tar, demonstrate to the grader the follows: 30 points

- Install an example driver, memory
- Create a special file associated with the newly installed driver
- Run examples
- Remove the driver