

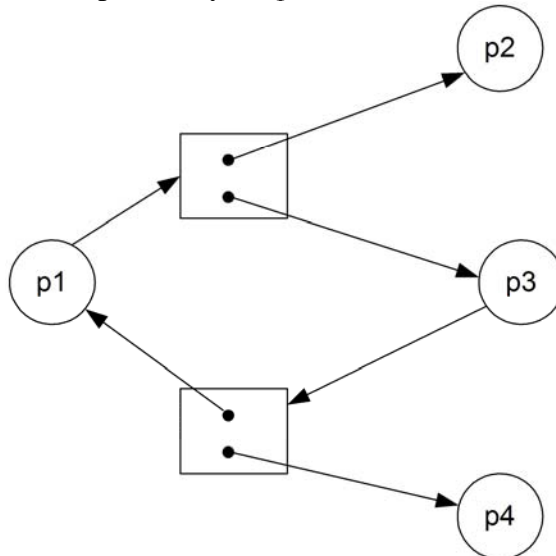
Homework No.4
Due Date: May 13, 2010

1. What is the meaning of the term *busy waiting*? What other kinds of waiting are there in an operating system? Can busy waiting be avoided altogether? Explain your answer. 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(S) | wait(Q); |
| wait(Q); | wait(S); |
| : | : |
| : | : |
| signal(S); | signal(Q); |
| signal(Q); | signal(S) |

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

4. Consider the traffic deadlock. 10 points
 - a. Show that the four necessary conditions for deadlock indeed hold in this example.
 - b. State a simple rule for avoiding deadlocks in this system.
5. Consider the following resource-allocation graph, identify whether there is a deadlock or not and explain why. 10 points



6. Compare pros and cons among three file allocation methods. 10 points
7. Explain how UNIX (Linux) device driver work and describe how VFS handle handing underline implementation of the drivers. 10 points