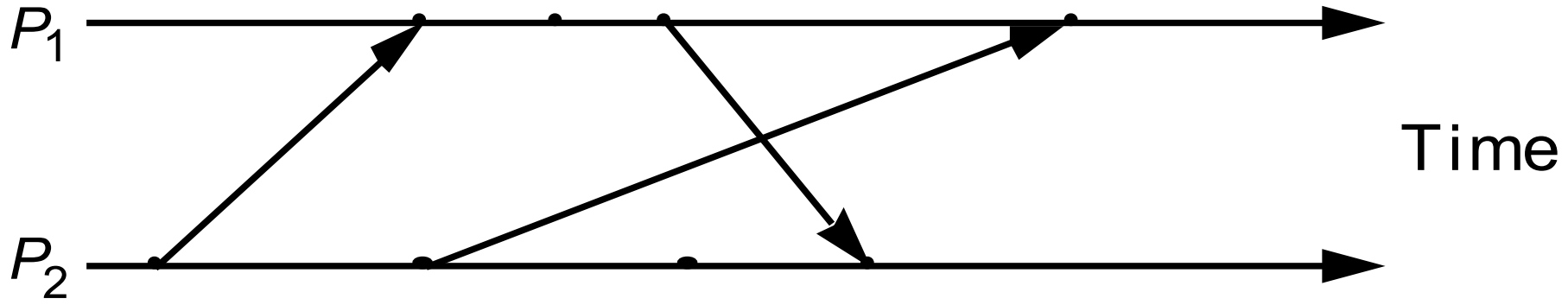
Tutorial week 6

Question 1



- The figure above shows events occurring for each of two processes, *p*1 and *p*2. Arrows between processes denote message transmission.
- Draw and label the lattice of consistent states (*p*1 state, *p*2 state), beginning with the initial state (0,0).

Question 2

- Jones is running a collection of processes $p_1, p_2, \ldots, p_N$. Each process p_i contains a variable v_i. She wishes to determine whether all the variables $v_1, v_2, \ldots, v_N$ were ever equal in the course of the execution.

  (i) Jones' processes run in a synchronous system. She uses a monitor process to determine whether the variables were ever equal. When should the application processes communicate with the monitor process, and what should their messages contain?

  (ii) Explain the statement *possibly* ($v_1 = v_2, = \ldots = v_N$). How can Jones determine whether this statement is true of her execution?

Question 3

- Is it possible to implement either a reliable or an unreliable (process) failure detector using an unreliable communication channel?

Question 4

- Give a formula for the maximum throughput of a mutual exclusion system in terms of the synchronization delay.