

Exercise for the lecture
Distributed Systems
 Summer 2012
 Sheet 2

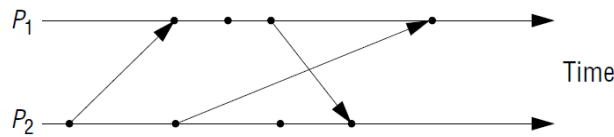
EXERCISE 2:

1. Synchronous System

You are running a collection of processes p_1, p_2, \dots, p_N . Each process p_i contains a variable v_i . You wish to determine whether all the variables v_1, v_2, \dots, v_N were ever equal in the course of the execution.

- Your processes run in a synchronous system. You use 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?
- Explain the statement *possibly*($v_1 = v_2 = \dots = v_N$). How can you determine whether this statement is true of your execution?

2. Global States for the Execution



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 $(0, 0)$.