

## Logical Clocks

### 1 Logical Clocks (15 points)

Give a distributed algorithm (similar to the one for Lamport's logical clock) that labels the events with the clock values assigned by Mattern's vector clock.

### 2 Consistent Cuts (25 points)

A *consistent cut* of a space-time diagram is a curve that intersects the time axis of all processes (between events) once and zero or more communication arrows, each of the latter in such a manner that its send event is to the left of the curve and its receive events to the right.

Assume you are given just the results of a cut - two sets of events,  $L$ , the left side events and  $R$  the right side events but not the original space-time graph - how could you use Mattern's Vector Clocks be used to determine if the cut is a consistent cut?

### What to turn in by 5 April 2011

Turn in the above work via Telem or to the course email [ise435@gmail.com](mailto:ise435@gmail.com). You may work in groups of two. If there are an odd number of students, I will permit one group of three.