CS5800 - Programming Project*

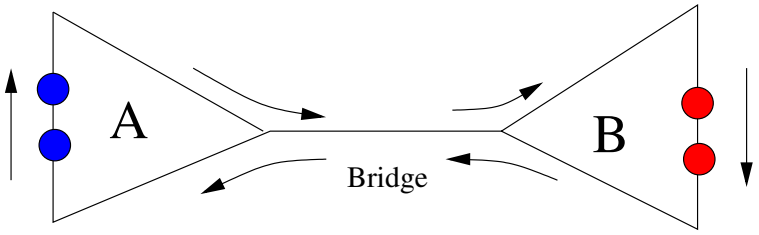

Figure 1: Road Map

As shown in Figure 1, Two towns A and B are connected with a bridge. Suppose there are four people and their moving directions are indicated by the arrows. The bridge is narrow, and at any time, multiple people cannot pass in the opposite directions.

1. Based on the Ricart & Agrawalas mutual exclusion algorithm, design a decentralized protocol so that at most one person can be on the bridge at any given time, and no person is indefinitely prevented from crossing the bridge. Treat each person to be a process, and assume that their clocks are synchronized.

2. Design another protocol so that multiple people can be on the bridge as long as they are moving in the same direction, but no person is indefinitely prevented from crossing the bridge.

Design a graphical user interface to display the movement of the people, so that the instructor can control the walking speed of the people and verify the protocol. Note that to receive full credits, you should provide instructions on how to compile and run your program, and your program should be well-documented.

*Note that this assignment needs to be done in a group of either 2 or 3 people.