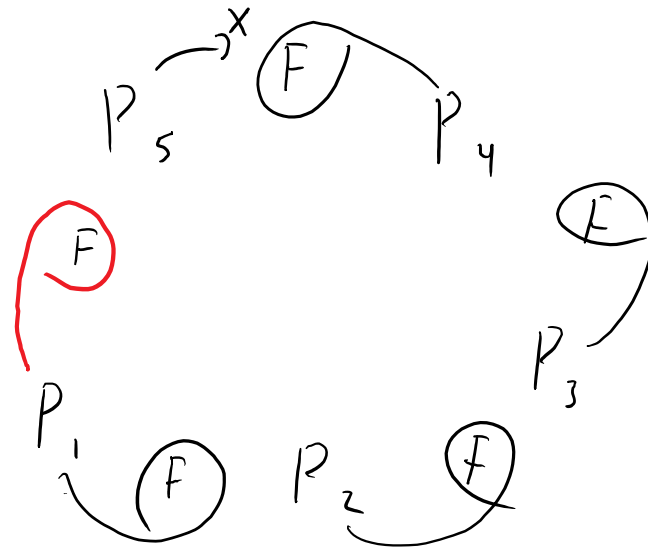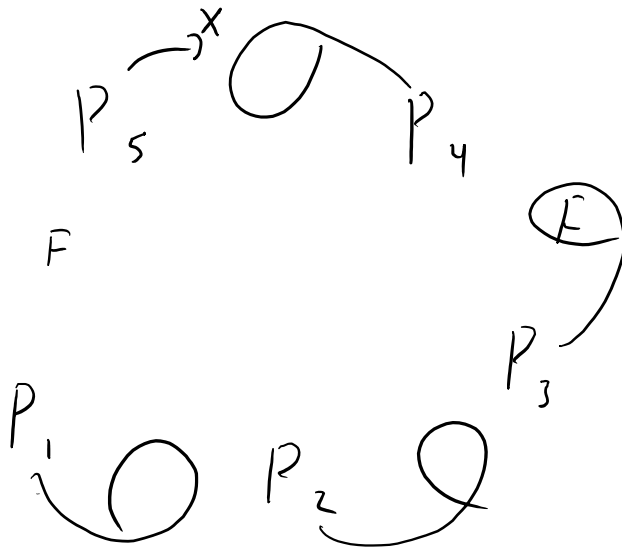# HW 7

Monday, March 28, 2016   8:06 AM

Brian Crafton

1.
    a.

    B. q1.c
1.
    a. q2.c
    b.

    last 10 events:
    thread #1 current location: 3 2, destination: 3 3
    thread #1 current location: 3 3, destination: 3 3
    thread #2 current location: 2 0, destination: 2 0
    thread #2 current location: 2 3, destination: 2 0
    thread #2 current location: 2 2, destination: 2 0
    thread #1 current location: 1 2, destination: 1 2
    thread #1 current location: 1 2, destination: 2 2
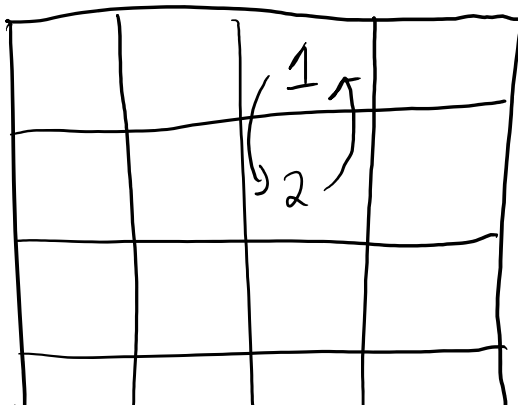   thread #1 current location: 2 2, destination: 2 2
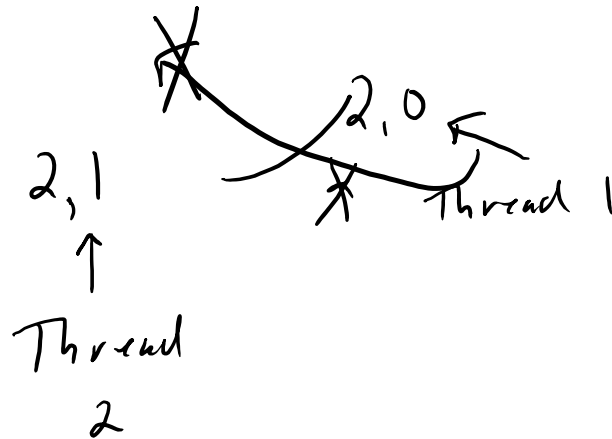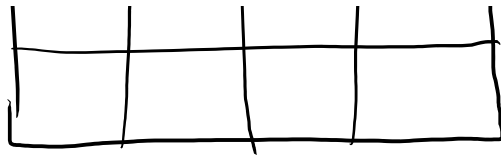   thread #1 current location: 2 0, destination: 2 3
    thread #2 current location: 2 1, destination: 2 0

    The dead lock occurs because thread 1 is attempting to move to 2,3 from 2,0 and thread 2 is attempting to move to 2,0 from 2,1. So they are both trying to lock down the node the other has locked and the dead lock occurs.

    c.

d.

The packets could be routed so that a dead lock never occurs. If packets source AND destination node were forced to be on the same (x) side of the grid and if a side was occupied a packet couldnt be sent down it, it would solve the dead lock issue.

Another way the problem could be solved is that if a packet saw that there was a dead lock it could randomly decide to move in the opposite direction. Example if the dead lock above were to occur, each packet could randomly choose to move the the positive or negative x direction and then resume protocol. A dead lock would never occur.