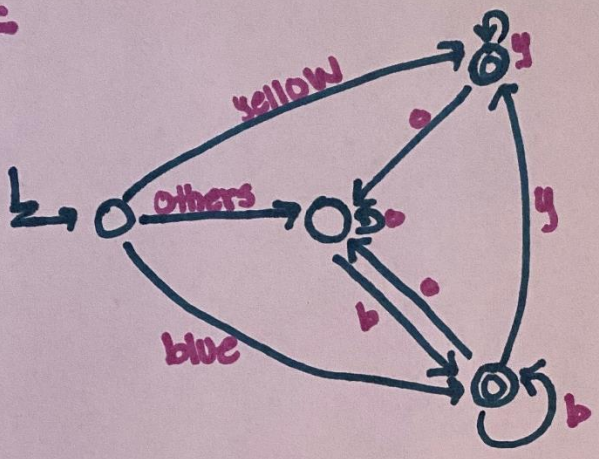
Morgan Baccus
Cpts 350
Homework #9

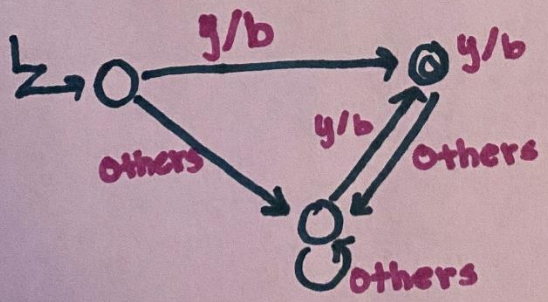
Problem 1

Part 1:



To find a ω-path that satisfies this condition, we walk the path and if it stops, we return true. Else, return false.

Part 2:



Repeat the same process as Part 1.

Problem 2

To design an algorithm that decides whether there a ω-path on which it passes infinite red nodes and finite blue nodes, we will need a loop that has no blue nodes first. This will indicate infinite red nodes. To see if we have a finite amount of blue nodes, we need to make sure there is no loop with only blue nodes, but a loop with red nodes and it passes a finite amount of blue nodes.

Problem 3

To design a good path, we can keep 2 stacks, r and b. Whenever we find a red node, Push 1 to the r stack and do the same for blue nodes on the b stack. If both stacks have the same length, then it is a good path. Else, it is a bad path.

Problem 4

To decide a bad path, we can use the same stacks r and b. Add 1 to the r stack whenever we find a red node and do the same for blue nodes on the b stack. If the r stack length mod 3 = 0, then it is a bad path. Else, it is a good path.