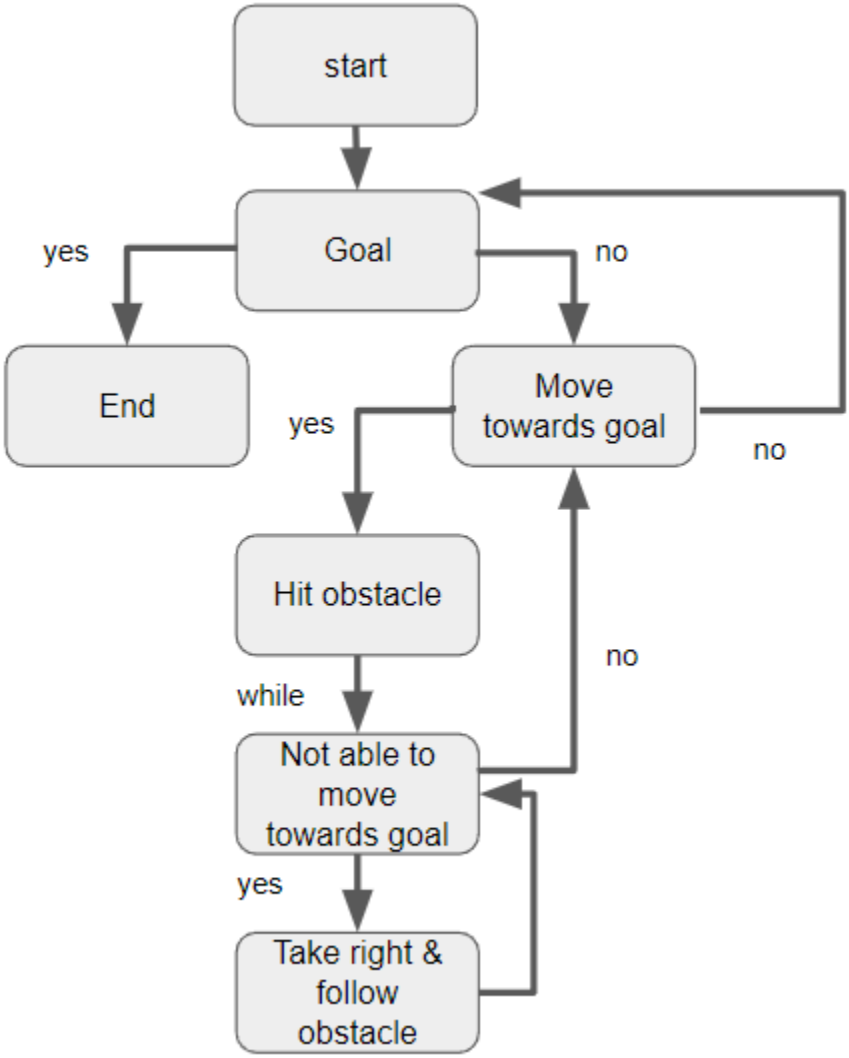
INTELLIGENT ROBOTICS (ECS 418)
ASSIGNMENT #1

Q3. Flowchart of pseudo-code implementation of a right-turning Bug 0 algorithm.



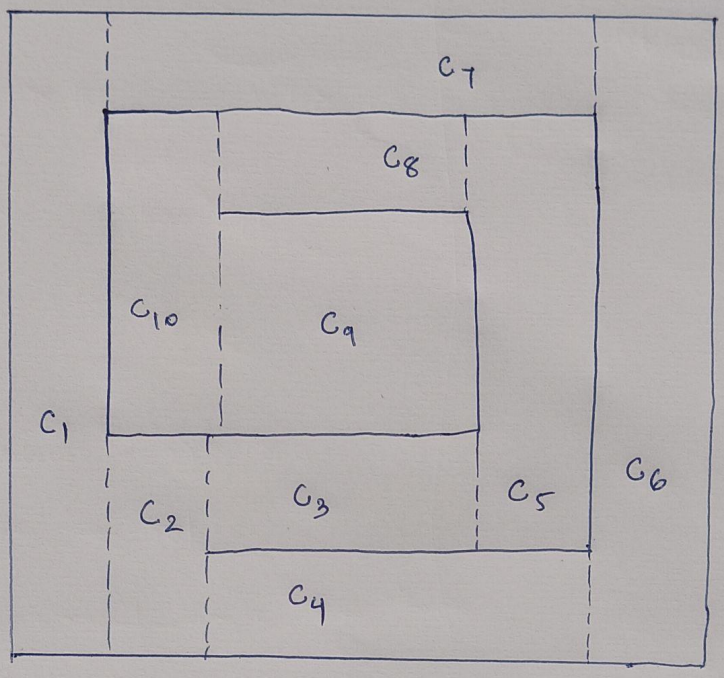
Q4.

An algorithm can be called complete if there exists a path and that path can be found in finite time, otherwise terminates with failure if it does not.

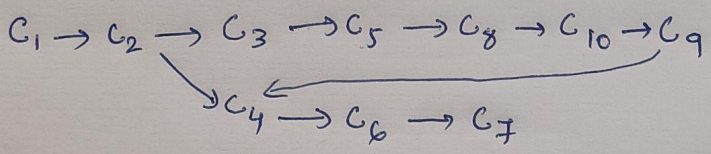
Bug0 algorithm may not always guarantee to reach the goal as seen in the webots simulation of bug0 algorithm. Here the robot always moves towards the goal and turns left when it hits an obstacle. The obstacle is spiraled around the goal, and the robot hits the obstacle twice in one revolution. So in the first hit it follows the obstacle and moves towards the goal. In the hit second the robot will follow the obstacle and move towards the goal but reach the previous position itself. This loop continues and the goal will never be reached. Hence bug0 is not a complete algorithm.

Q7.

Q.7.

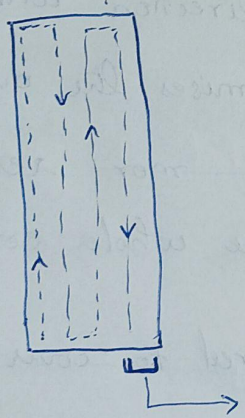


Let the starting position of robot be in C_1 cell. Then the reeb graph will be:



Q8.

Q.8. For a cell, the lawn mower pattern will be



→ sensing radius which is equal to the size of the robot.