

Intelligent Robotics

Assignment – 1

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Roll No: 19315

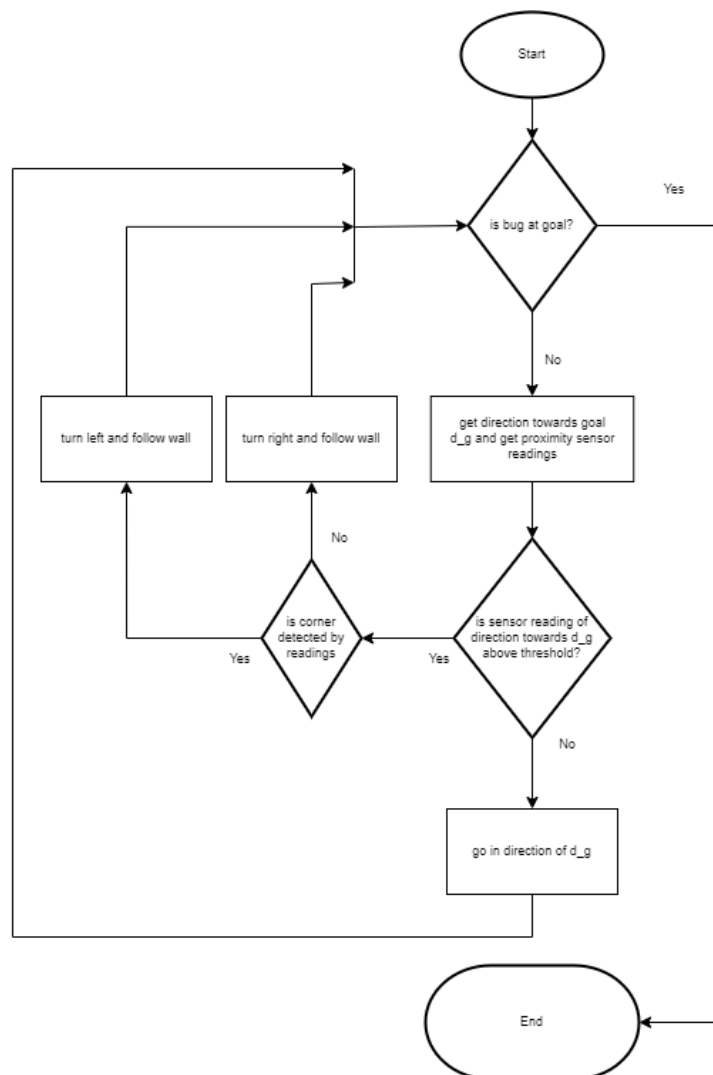
Question 1

Code in utils.py

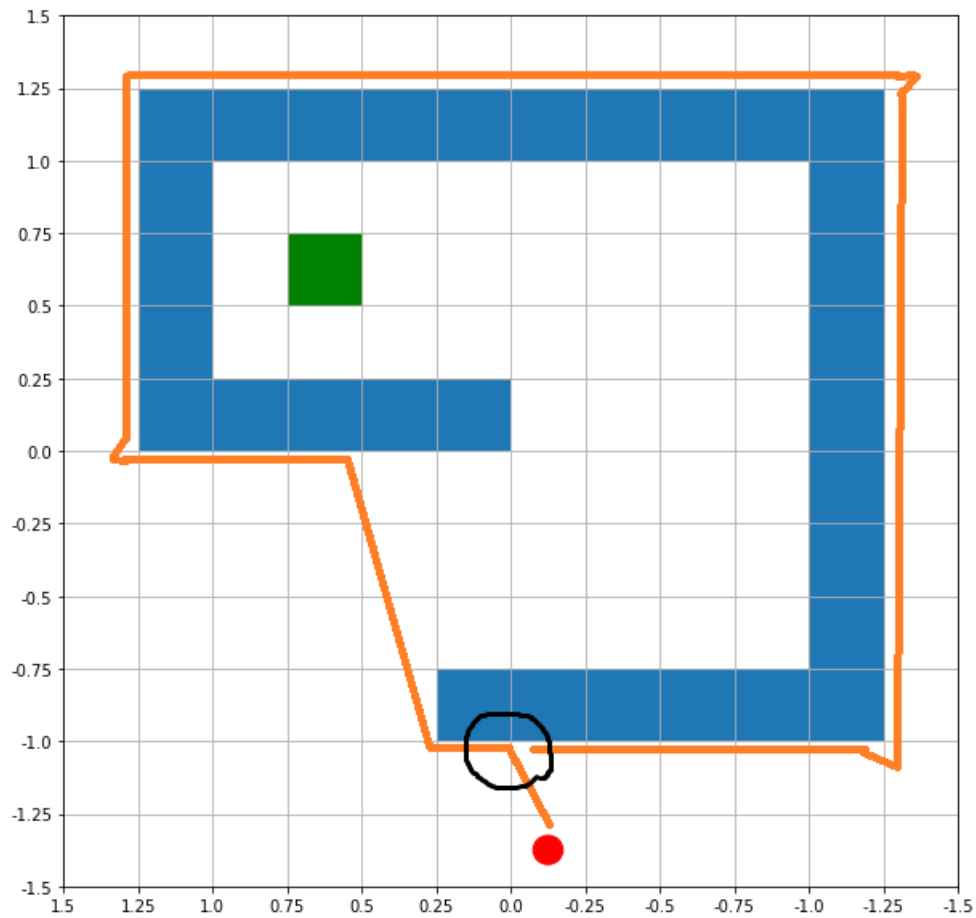
Question 2

World file and controller (.py file) in folder q2

Question 3



Question 4



A bug algorithm is a complete one if it can reach the goal in finite time. Consider the above environment, with the green rectangle as the goal, blue polygon as the obstacle and the red circle as the left-moving bug. Bug-0 does not find the goal here because once it starts moving towards the goal in this case, it hits the obstacle and then moves towards left, and hits another obstacle again when it was able to move towards the goal and then follows the wall all the way till the same place it hit again, making the loop again. This repeats since the bug will never be able to reach the goal. Hence, it is not a complete algorithm.

Question 5

Code in q5

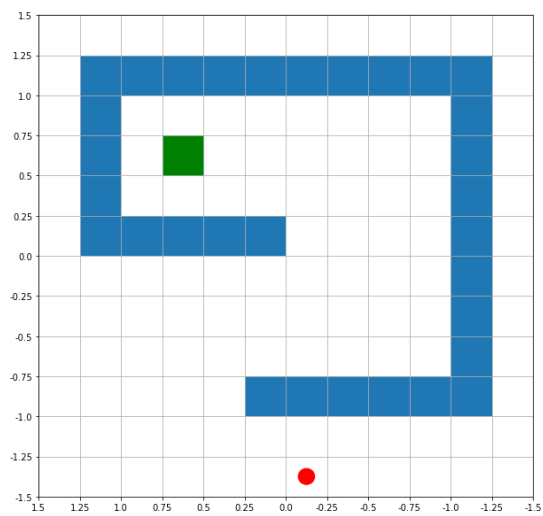
Question 6

Code in q6

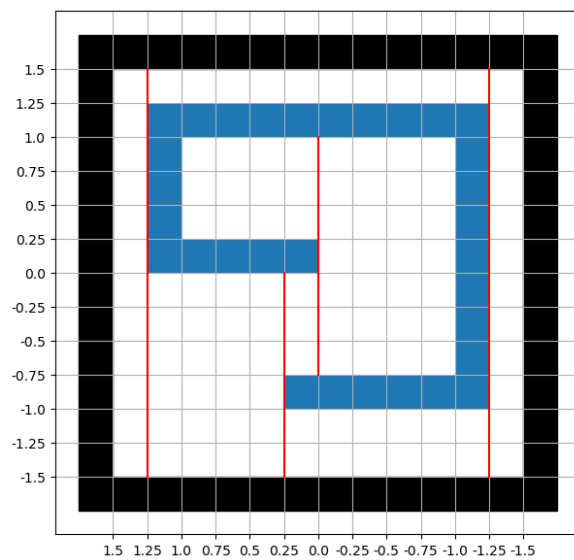
It is not complete because since it is memory less it cannot remember the last hit point, hence it keeps looping and never finds the goal.

Question 7

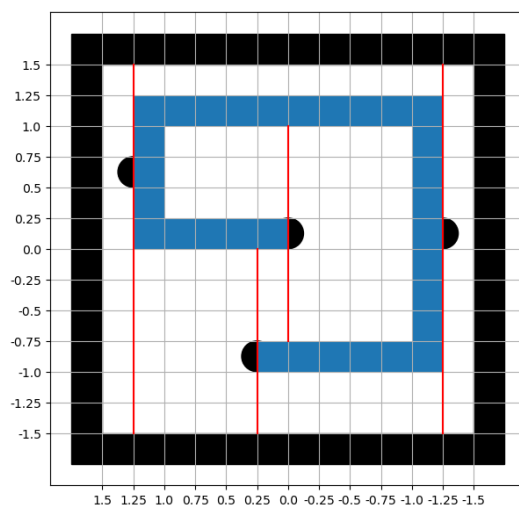
Code in explore.ipynb



Environment



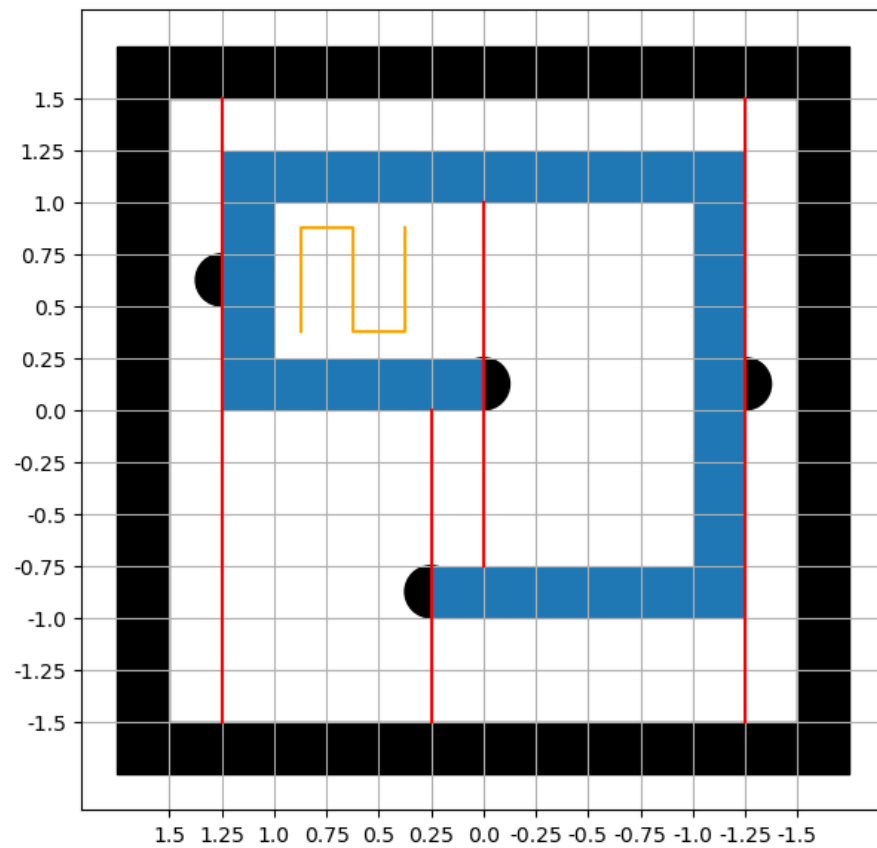
Trapezoidal Decomposition



Reeb Graph

Question 8

Code and function to generate lawn mower pattern in explore.ipynb



Lawn mower pattern

Discussions with

Pushpendra and Harshul : For Q1

Others for idea of using GPS