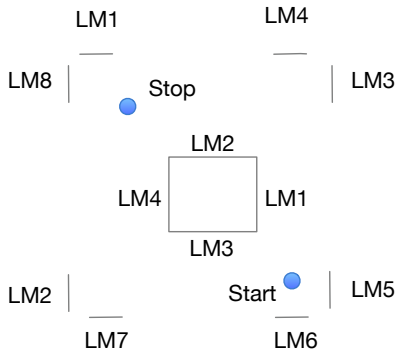
Homework 4 - CSE 276A - Intro Robotics

Due: 26 November 2024, before midnight

An important part of robotics is path and task planning. In this home work we will only consider path planning.

1. Setup an environment in a 10ft $\times$ 10ft area with landmarks at the edges as show in the figure. The landmarks should be similar to those used in HW2/3. Measure the position of your landmarks and your robot can have access to this information. Set the start point and goal point in the the diagonal axes. Place an obstacle of size 1x1 - 2x2 ft in the middle of the workspace and you can place landmarks around the obstable to help localization. The final setup should be similar to one shown below.



2. Design two path planning algorithms. One for maximum safety and one for minimum time/distance. You are free to choose which methods you want to use for each of the problems.

3. Select an appropriate world representation and a corresponding planning algorithms for each of the two problems:

   (a) Motivate your representation

   (b) Motivate your search/planning algorithm

   (c) Include a visualization of your representation and planned path.

   (d) Briefly describe your implementation and results

4. Your report should describe your architecture, representation, algorithm, results and include a link to two videos of the runs for safety /

time. Include your complete code in a zip file. **Please submit your pdf report separately and do NOT include it in your zip file.**