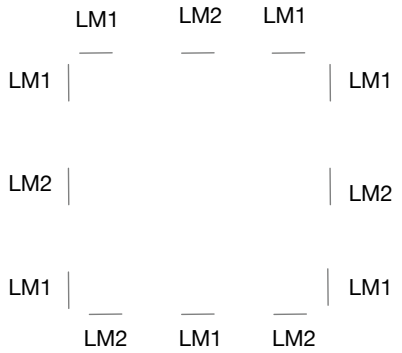
Homework 5 - CSE 276A - Intro Robotics

Due: Sunday, 8 December 2019, before midnight

The objective of the final homework is to design a "roomba" like system. The robot should be able to navigate an environment and provide a level of coverage of the area. You are free to choose any architecture for this assignment, but subsumption may be a good starting point.

1. Setup an environment in a 10ft $\times$ 10ft area with landmarks at the edges as show in the figure. The landmarks will be QR markers as used in HW2/3/4. Measure the position of your landmarks / walls



2. Use localization systems from earlier homework to ensure the robot has a certain level of situation awareness. It is not expected that the robot will be able to detect walls / obstacles so you have to provide boundaries through localization.

3. What behaviors do you need to provide coverage / avoidance?

4. Implement a basic version of the system using ROS or Python

5. Provide a diagram that explains the control flow in your system

6. Demonstrate the performance of the system with a video / graphical illustration of the trajectories generated by the system

7. (Extra credit 25% extra) Can you provide any performance guarantees for coverage with your system?

8. Report should as a minimum contain i) architecture of system, motivate your design choice(s) ii) brief description of your behaviors, iii) illustration of the performance of your system. iv) (optional) derivation / description of performance guarantees.