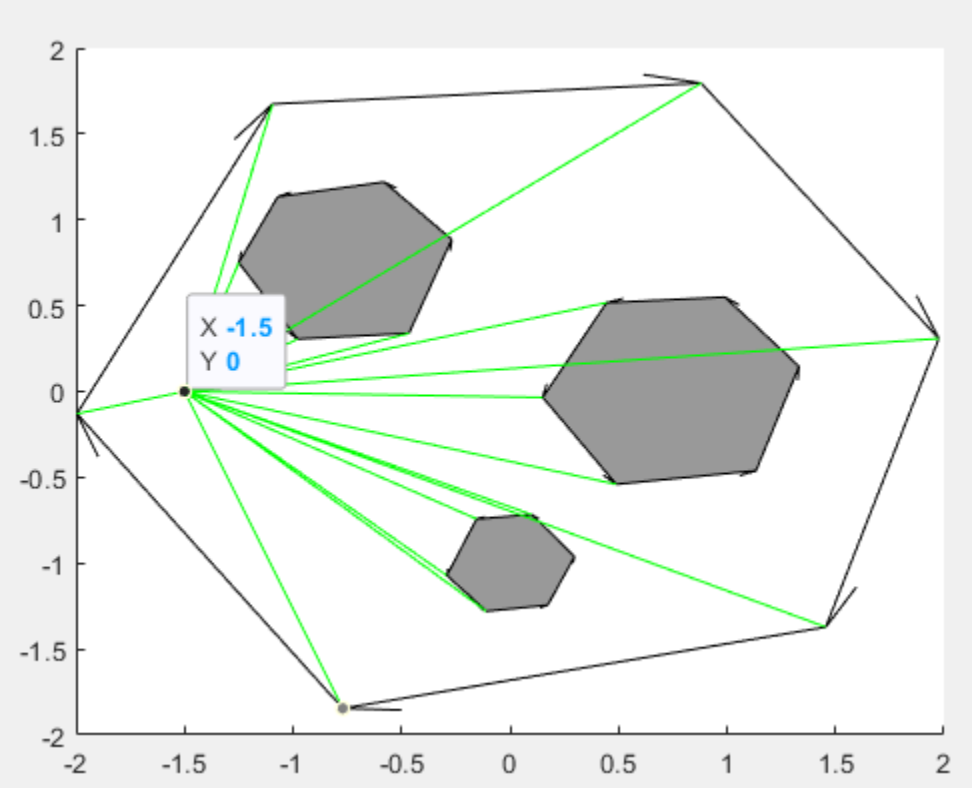
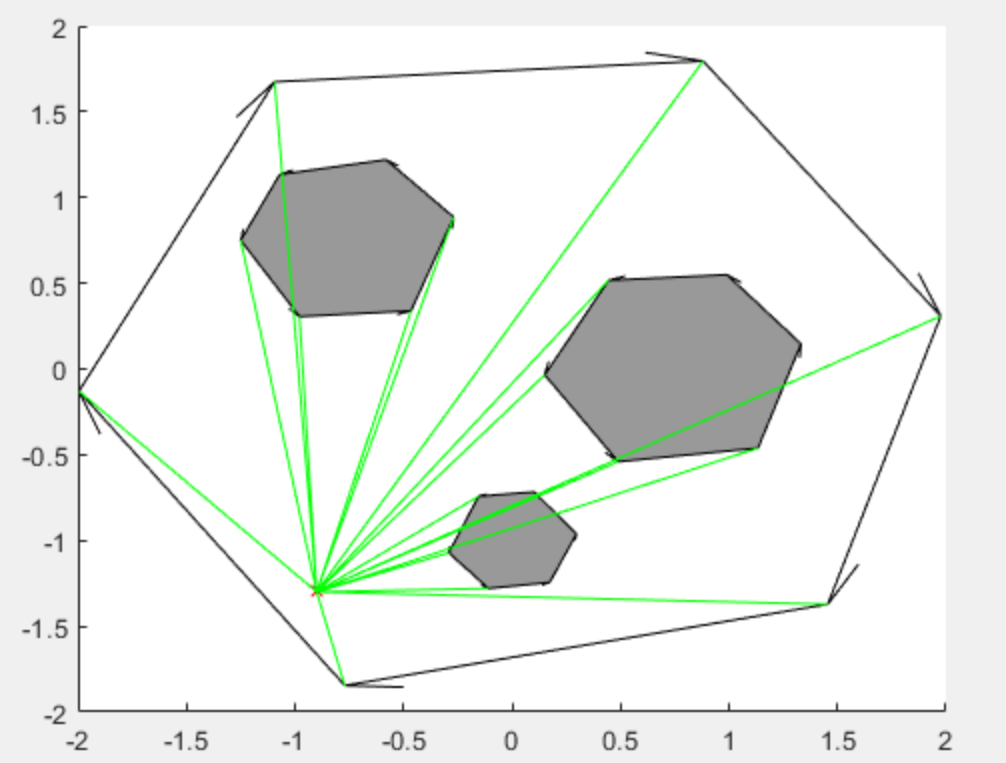
Demetrios Kechris ME570 HW1 Report

I am using 2 late homework credits for this assignment

1.1) Visibility test function output




2
1.5
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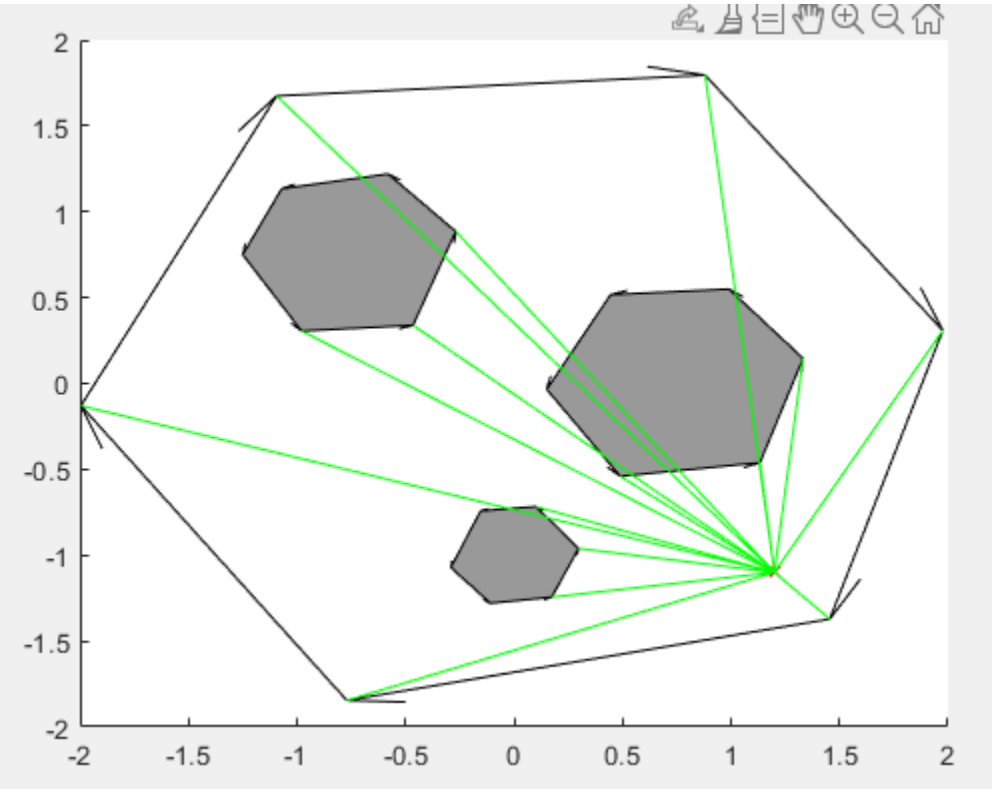
2
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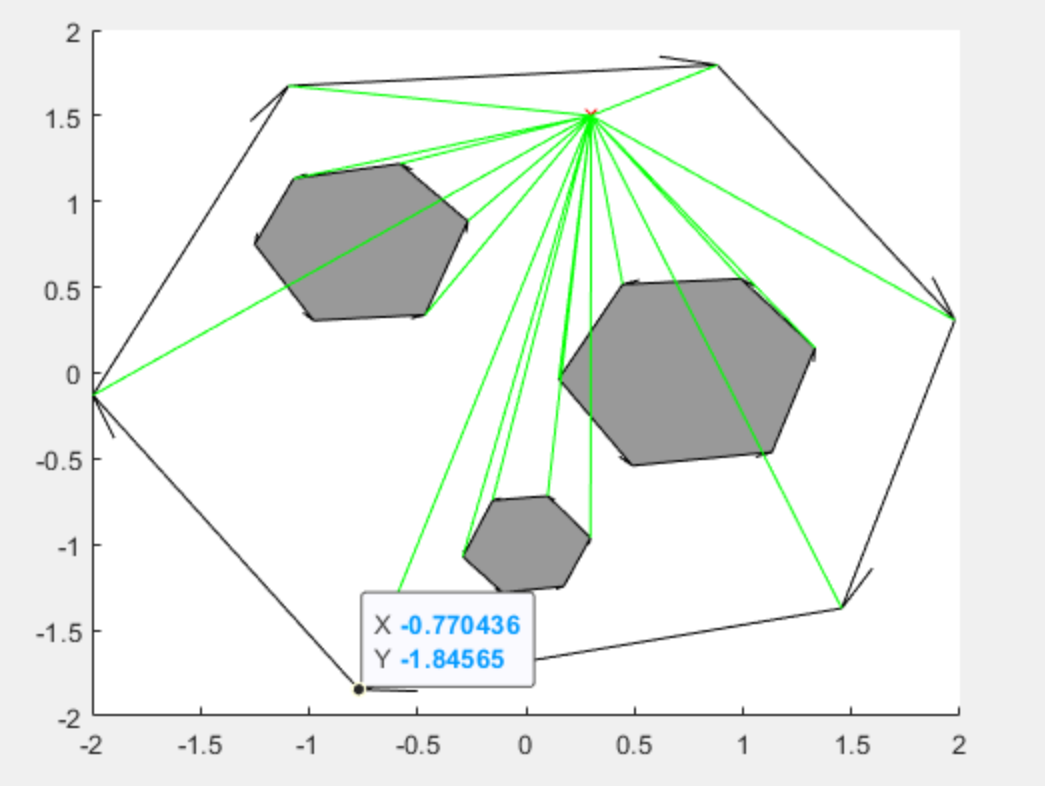

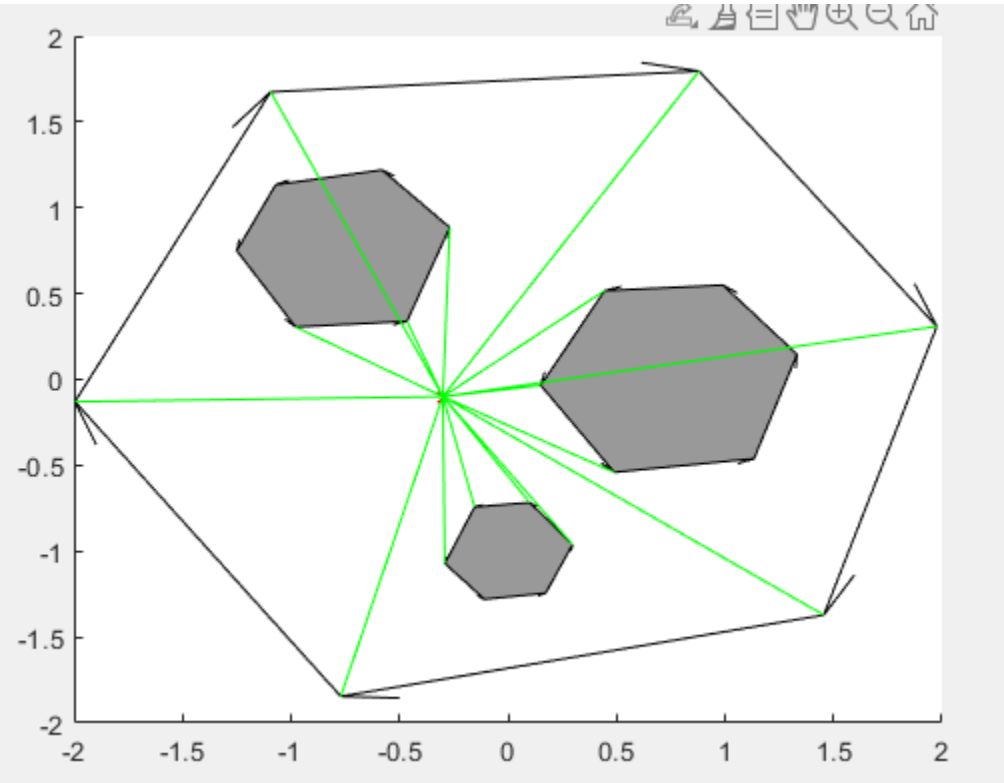

1.2) Test your visibility-roadmap planner

It was hard to implement 1.4 since it was based off the HW4 structures, which I did in Python. If the python auto graders were up, I would have done this code in Python instead of Matlab.

1.3) The graphs are all able to get to the goal, each in their own way.
The gradient descent can avoid obstacles with the weights, and depending on the weights it can take the robot closer to or further from objects, or unable to reach the goal at all.
The A* implementation is also able to avoid the obstacles easily, provided that the map has enough resolution to fully capture the features of the map. Too fine detail will bog down the planner, but too little detail will not allow it to take optimal paths.
This implementation allows us to take the most direct route to the goal by utilizing a visibility graph. If the robot can see the goal, then it can get straight to there without problems. The visibility map provides a roadmap to move from one area to another, allowing for simple direct travel to the goal, much like we saw in class with the Pacman world.