CSE 468/568 Lab 5: A* Planning

The objective of this assignment is to plan a path for a robot from a given starting point to a destination. Create a new package called `lab5`, and place the world files (`playground.pgm` and `playground.world`) from the associated file (`lab5.tar.gz`) in the appropriate sub-folder.

The objective of the assignment is simple. Use A-* planning algorithm to find a route from a default start point (-8.0, -2.0) to a default goal (4.5, 9.0). Please go through the tutorial on ROS Parameters. The goal should be defined as two parameters `goalx` and `goaly` both of which should be doubles. This allows us to set a new goal parameter, and the robot should plan a path to the new goal.

There are a couple of challenges in implementing A-* planning as discussed in class. The first challenge is to derive a graph representation of the workspace. This depends on the map representation that the estimation block provides us. Typical examples of such representations are occupancy grids - a grid representation with 1s and 0s with 1 indicating an obstacle in that cell and 0 representing an empty cell. For this assignment, we have provided you such an occupancy grid. It is the file `map.txt`. It grids the world as 1X1 cells. You should import this into your program as the map.
The second challenge is the heuristic for the estimated cost between the current node and the goal. Given you know the current location and the goal, you can use Euclidean distance between the current location and the goal as the heuristic cost.

Once planned, you should command your robot to execute the plan to go from start to goal.

Submission Instructions

You will submit `lab5.tar.gz`, a compressed archive file containing the lab1 folder. Please name the launch file `lab5.launch`.

Use the `submit` script for submission using the syntax

`$ submit_cse468 lab5.tar.gz`

or

`$ submit_cse568 lab5.tar.gz`

depending on whether you are taking cse468 or cse568 respectively.

Details on the usage of the submit script can be found here.

The assignment is due Sunday, Dec 9 just before midnight.