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Lab 4: Mapping

1. It requires a lot of space to store all of that information. It also creates a bunch of unneeded edges which can slow down the runtime of a pathing algo. This is problematic for robots where real time performance is very important. With the implementation on 4.2 we can move based on cost using it to eliminate edges thus reducing some of the earlier drawbacks.
2. We have two subscribers. One for the robots odometry (Pose2d) and one for the robots state (String). The state subscriber gets information for the light sensors and sometimes the ultrasonic depending on if it sees something. The odometry subscriber gets the robots position, (x, y, Θ) .
3. We have a total of 5 publishers. The first publishes motor commands in a float 32 multiple array which is a list of two and can be either -1, 0, 1. The values represent if each wheel should rotate backwards or forwards. The second publisher issues ping commands (Empty) and is used to get data back from the sparki simulator. The third publisher publishes the servo as an int (Int16) which will rotate the sparki the specified degrees. The fourth publisher involves publishing the odometry as a Pose2D which takes the form of (x, y, Θ) . The last publisher involves the render which has Empty type but is used to refresh the graphics of the simulator.
4. There is a difference between the obstacles and what the sparki finds. This mostly occurs because the sensor only senses the first obstacle and then returns which only allows us to see the edges of the obstacles and not the obstacles themselves. Also some obstacles appear adjacent when they are not because of the discretization of the coordinate system. To resolve this, we could increase the resolution of the discretization, which might allow some empty space to show up more often.



5. Now that it's starting to make more sense it's not as bad. The problem is that ROS has a very steep learning curve. It is nice however that it doesn't really care what its receiving or sending that's all up to you. Also, it does a lot of technical heavy lifting.
6. 10 Hours