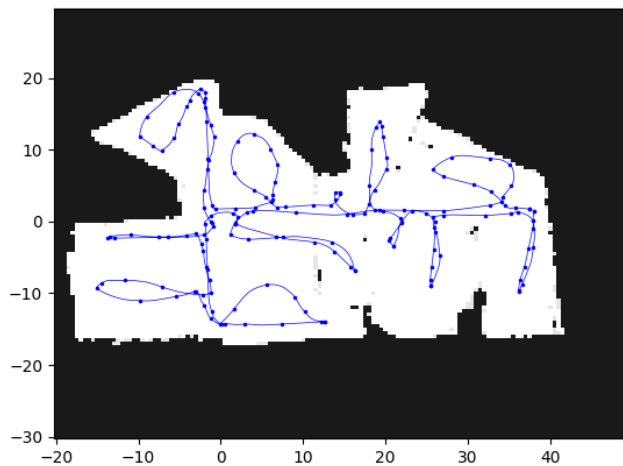
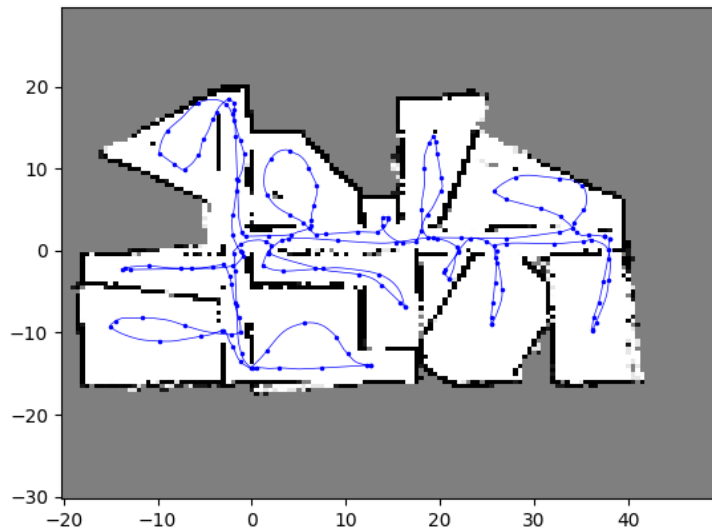


Coding Set 2 Occupancy Grid Mapping

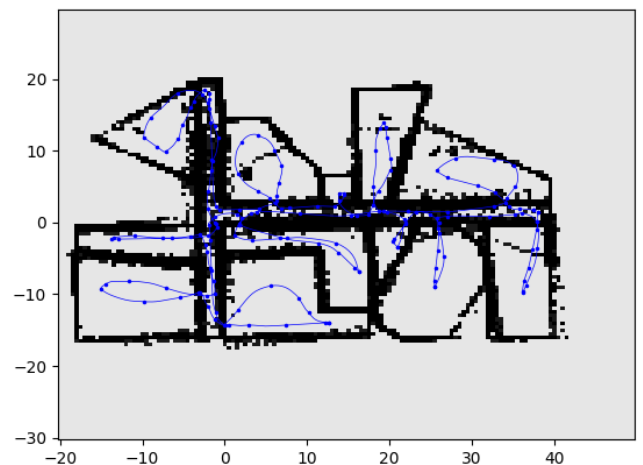


QUESTION: Why do these differences in the map occur?

This image to the left is with a prior of 0.9. It shows a map that believes almost every cell is unoccupied. The outer edges of the map are very clearly defined, but the inner walls are non-existent. This makes sense because the log odds of a high probability is a relatively high number. It is subtracted from the value of the cell every time the

`integrate_laser_range_ray` function is called, which should result in small values, unless there are many measurements that give a high probability (p_{occup}), which is what happens at the edge of the map.

The image to the right is with a low prior which results in a lot of certainty in the location of walls and other obstacles. This is because as the cells are updated there is a



low number being subtracted due to the log odds prior.

QUESTION: What about the way we handle occupancy grids contributes to this?

- Every time step the map is updated, making it straightforward to plot the robot's current map every n timesteps. This discretization makes it much easier to step through the process and see how the map changes with given measurements.

```
daniel@CTB455-Salmon:~/Documents/lab2-occupancy-grid-mappings$ pytest -v -rn --tb=no --no-header
===== test session starts =====
collected 13 items

tests/test_cells_to_update.py::test[-90] PASSED [ 7%]
tests/test_cells_to_update.py::test[0] PASSED [ 15%]
tests/test_cells_to_update.py::test[90] PASSED [ 23%]
tests/test_cells_to_update.py::test[180] PASSED [ 30%]
tests/test_integrate_laser.py::test PASSED [ 38%]
tests/test_inverse_sensor.py::test_free PASSED [ 46%]
tests/test_inverse_sensor.py::test_occup PASSED [ 53%]
tests/test_inverse_sensor.py::test_prior PASSED [ 61%]
tests/test_update_cell.py::test[0] PASSED [ 69%]
tests/test_update_cell.py::test[1] PASSED [ 76%]
tests/test_update_cell.py::test[2] PASSED [ 84%]
tests/test_update_cell.py::test[3] PASSED [ 92%]
tests/test_update_cell.py::test[4] PASSED [100%]

===== 13 passed in 0.03s =====
daniel@CTB455-Salmon:~/Documents/lab2-occupancy-grid-mappings$
```