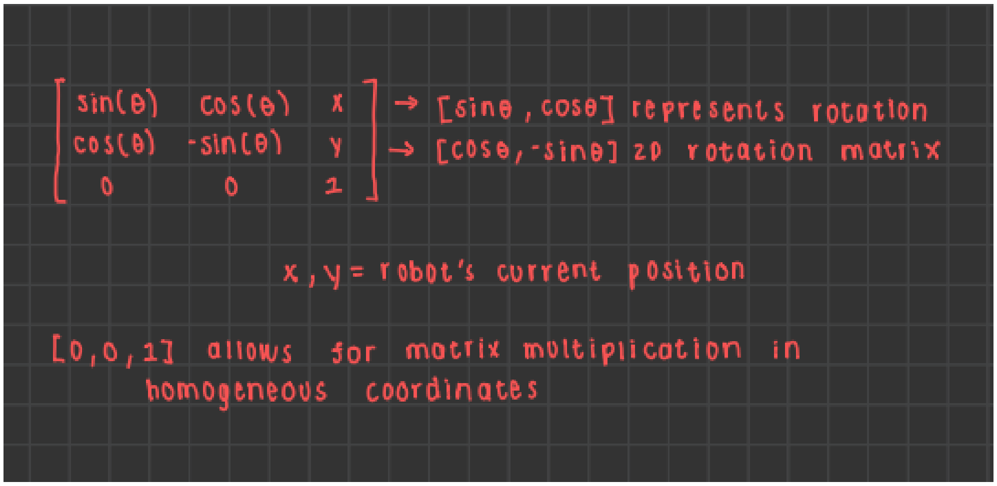
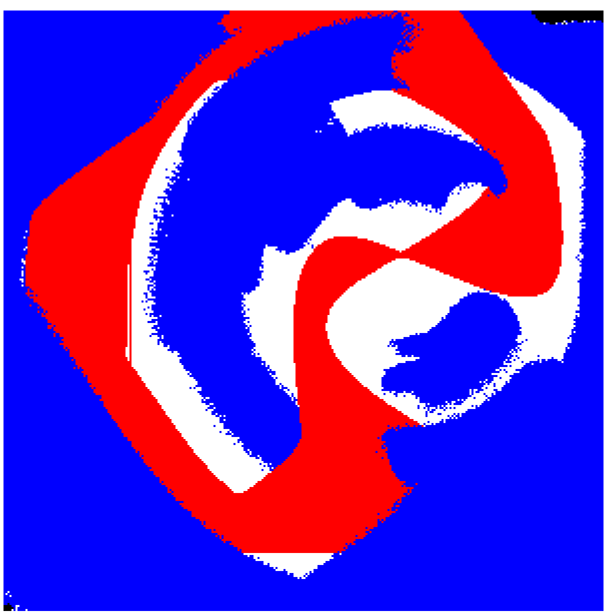
Lab 4 Mapping

1. Patrick Nguyen, Wei Jiang, Nikko Gajowniczek
2. My group spent approximately 3 hours in this lab.
3.



4. The spatial resolution can be found by 1m^2 ÷ 300 * 300 = 0.0000111m^2 /pixel for meter squared and for linear it will be 1m ÷ 300 = 0.0033 m/pixel.
5. If the odometry is not perfect there could be potential position errors, drifts in the robot's locations and potential inaccuracies in obstacle and free space mapping.



This is what would happen if we let the simulation run for 2 hours.

6. I could choose a good resolution if it provides enough detail to be able to distinguish obstacles and it matches sensor precision. If there is too low resolution, it will miss small obstacles, lose details from the environment and lose precision when

navigating. But if there is too high resolution, there will be more memory that is being used and more noise that is being amplified.

7. LIDAR can help with loop closure by taking snapshots of the environment and comparing each of them to see if it has been to a previous location. It can also correct position errors to help with the loop closure.