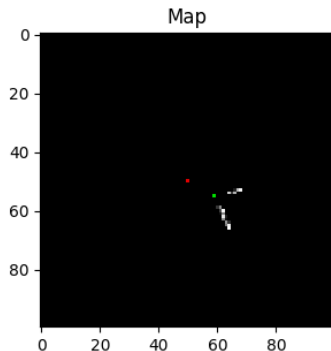
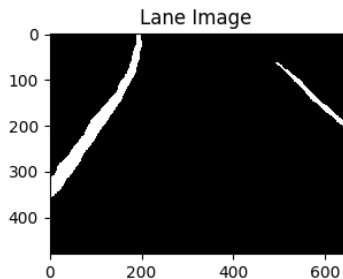


IGVC Milestone 3

Implement mapping

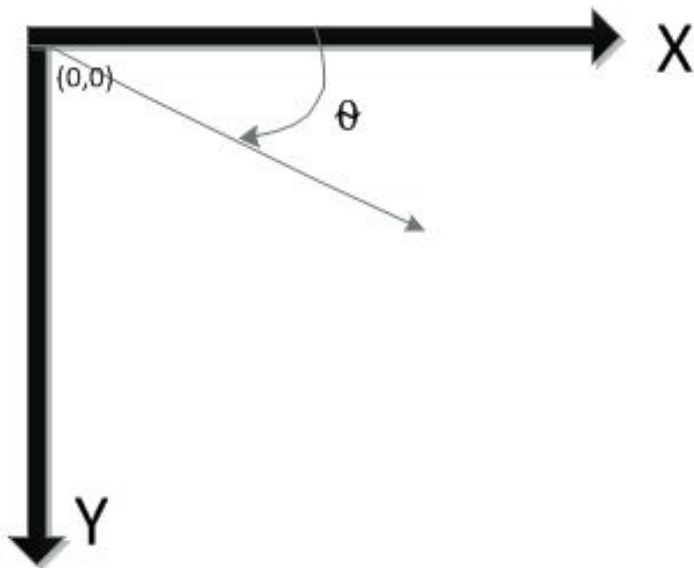
Mapping is an essential feature of the robot.

The robot need to remember details about the lane, the obstacles and the waypoint in order to find a path.



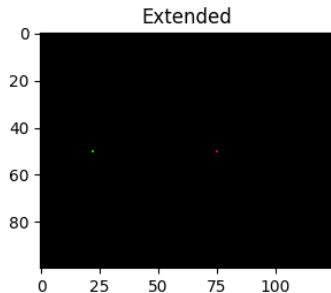
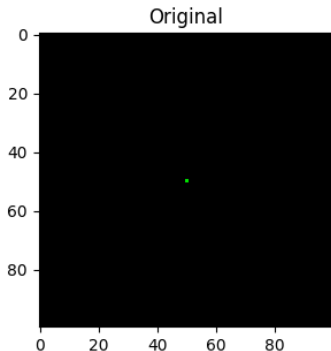
Implement mapping: Data structure

The module uses a numpy matrix to represent the map. As a result, the map use the left-handed Cartesian coordinate system.



Implement mapping: Expandable

In order to expand the map, the modules will copy the old map into a larger matrix and may change the origin point may be changed depending on the direction of the expansion

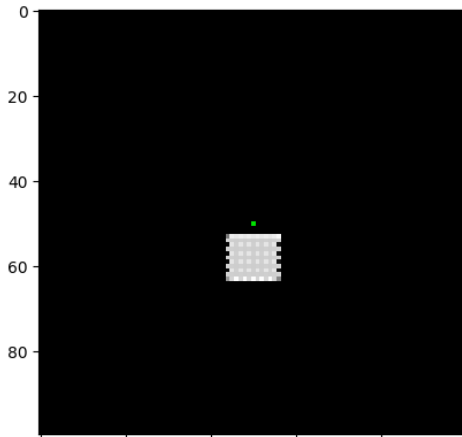


Implement mapping: Mapping the lane and the obstacles (1 of 3)

The modules will receive a list of coordinates of objects that can obstruct the robot movement. It will apply the information into the map using matrix transformation (scaling, rotating).

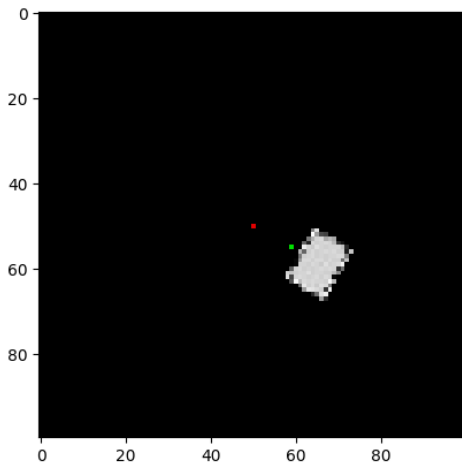
Implement mapping: Mapping the lane and the obstacles (1 of 3)

First, we will assume that the robot is in its initial configuration (Stay at the origin point, align with the vertical axis). The coordinates will be fitted into the robot field of view.



Implement mapping: Mapping the lane and the obstacles (1 of 3)

Then, the modules will transform the coordinates to match the robot current position.



Test mapping

Mapping module is currently tested using only unit testing.
After recording accurate parameter for practical uses, the team will test the module integration with other systems in the robot.

Next milestone

- ▶ Implement and test obstacle detection
 - ▶ Access the robot camera and find the appropriate mode for finding the obstacle
- ▶ Measuring the robot field of view in order to adjust the programs' configuration variable

Questions?