Visualize

1 Y22 UG + 2 Y21 UG

Rules

● There is 1 problem statement with three parts given to you. Each part has different points. So, in the end, the team with the maximum number of points will be the winner.
● Time given to you for the event is 3 hours.
● The image or video given to you will be a sample image/video only. The final judgment is based on the Test image (on which we will test your code) which is not the sample image/video.
● You are allowed to use the Internet.

Problem :

Part 1 - “Path in the noisy image”

You are given an image that contains a matrix of variable size. The image may contain noise, so you may need to remove it. Cells are filled with 2
different colors: Blue and Yellow. You have to go from starting cell (top left) to the end cell (bottom right).
From each cell, you can either move right, left, up, or down. You are not allowed to go through Yellow cells. You can only touch Blue cells. You have to print the path (coordinates) on the terminal that you will be taking to go from starting point to the endpoint such that your path traveled is the shortest. (Print the coordinates for the cells and let the top left cell be (1,1). The cell towards the right of it will be (1,2) and so on).
Note: The first and the last cell will always be marked Blue.

Part 2 - “It's a Turtle !”

The GitHub repository link to the TurtleSim ROS package will be provided during the event. You have to get this package running on your machines. The repository already contains a few nodes to help you, so you are advised to explore all the files in the package. Your task is to write a launch file for this package such that upon running it with the help of “roslaunch”, it launches the turtlesim gui, and the turtle moves “forward” by pressing the “up” key, “backward” with the “down” key, “turns left” with the “left” key and “turns right” with the “right” key.

Part 3 - “The Turtle follows the shortest path”:
Attempt this part after completing the above two tasks. Now that you have the path from the image and the turtlesim running. You are required to combine these 2 such that-
Upon running the submission for part 1, it saves its path followed (or any other parameter according to your choice) in some file (location according to your preference). Modify the ROS package and write a launch file (different from task 2), upon running it, the ROS package will use this saved file to move the turtle in a path similar to your saved path.
For example: Suppose you are at a particular cell in the image and are required to move the upper cell for the shortest path; the turtle in the turtlesim should move some length in the upwards direction. If from that cell you are required to move to cell towards the “right”, then the turtle should move some length towards the right (perpendicular to the previously traveled upward movement)

Scoring:

1) Marks for Part 1(Complete Answer): 40 Points
   In case you are not able to solve the complete part 1, then partial marks would be given.
   - If you detect the correct testing matrix: 20 Points
   - If you get any correct Path from start to end Point: 20 Points

2) Marks for Part 2 (Complete Answer): 10 points
3) Marks for Part 3 (Complete Answer): 40 points

Tie Condition

In case there is any tie, the team taking the least time to acquire the points shall be declared the winner.

***Note*: In case of any disputes, the decision of the Coordinators would be final and binding to all.**