Task 2 – Path Planning

Please find the *task2_code.py* file in the folder *Task2_Practice*. Modify the *task2_code.py* to accomplish the following:

Given:

A set of test images, each containing

- A grid of 100 squares of size 40x40 pixels
- **Start** marked with a red square
- **End** marked with a green square
- **Obstacles** marked with black squares

The squares are identified by the coordinate (x,y) where x is the column and y is the row to which the square belongs, as shown in the picture. Assuming a robot moves from **Start** to **End**, the objective is to find the shortest path from **Start** to **End**.

A set of five test images is given at: *Task2_Practice/test_images*. An example test image (may not be of the same color as defined above) is given in Figure 1.

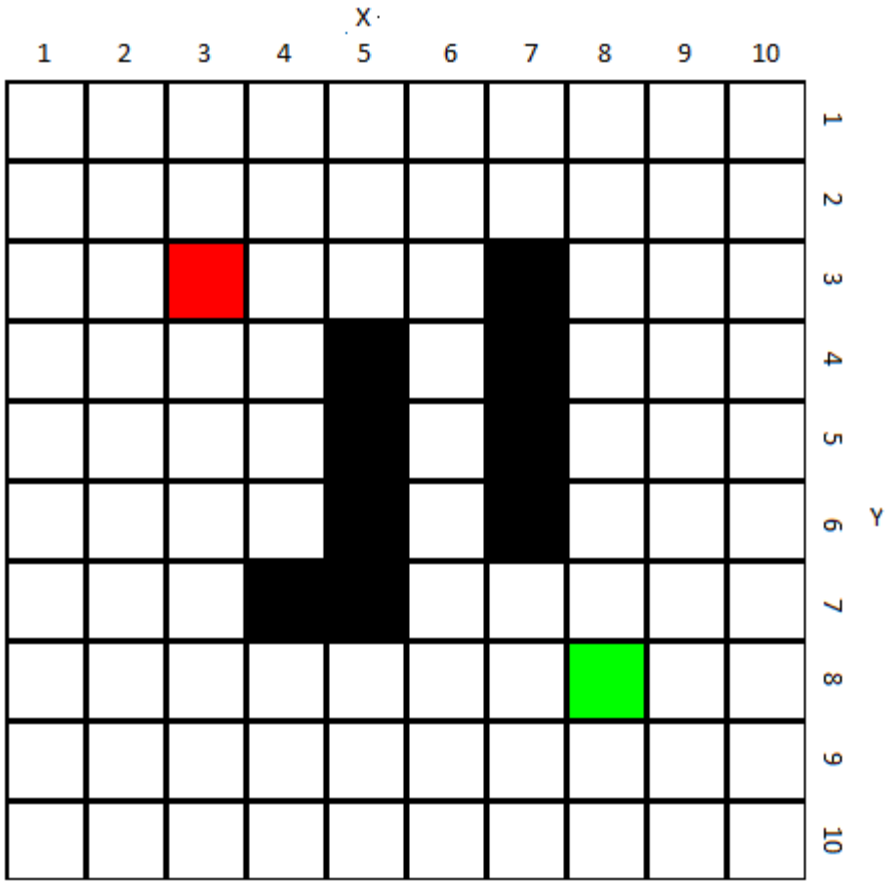

Figure 1: Example Test Image

Problem Statement:

The robot starts from the **Start**; it should reach **End** by moving either horizontally or vertically. The length of the path is determined by the number of moves the robot makes. The challenge is to find the **shortest path** to reach **End**.
A "snippet" of outline code is given in *task2_code.py* file.

- Teams Modify the ***play(img)*** function in the *task2_code.py* file to take a test image as input and return the length and coordinates of a shortest route on the Python IDLE console.
- For example, given the test image in Figure 1 as input, one of the solutions is as indicated in Figure 2.

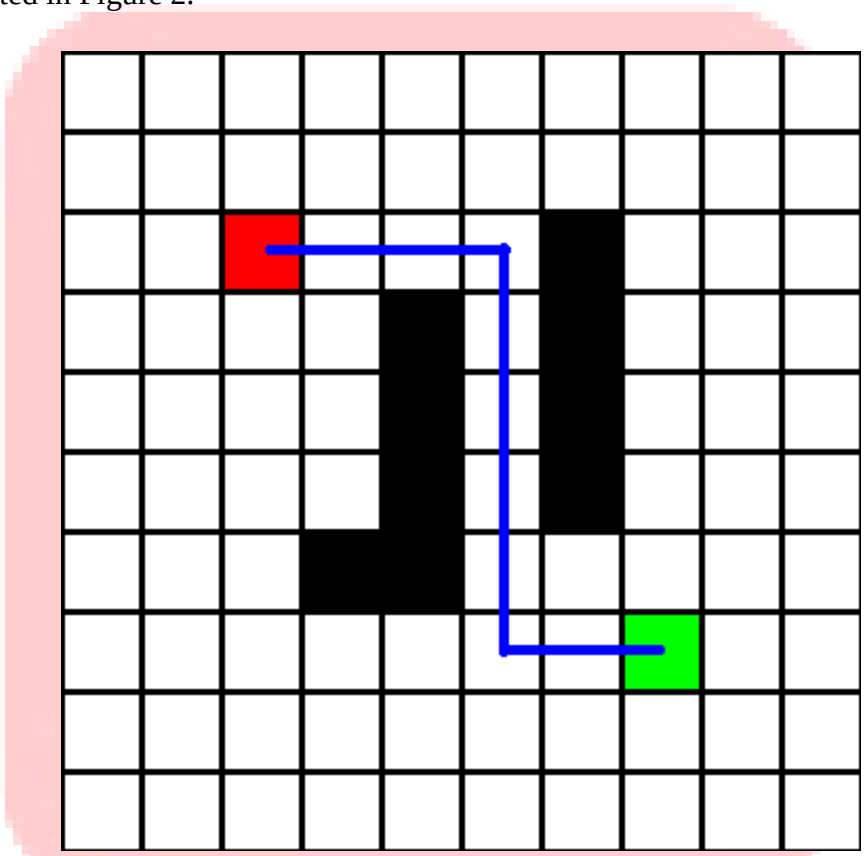

Figure 2

- The output on the Python IDLE console will look like:

```
route length = 10
route_path = [(4,3),(5,3),(6,3),(6,4),(6,5),(6,6),(6,7),(6,8),(7,8),(7,9)]
```

To do:

1. Open the snippet in *task2_code.py* in Python IDLE editor, which looks like:

```
def play(img):
    '''
    img-- a single test image as input argument
    route_length  -- returns the single integer specifying the route length
    route_path - returns the path as a list of co-ordinates of form (x,y)
    '''
    #add your code here

    return route_length, route_path
```

2. Modify the *task2_code.py* file by adding your code after the comment `#add your code here` in the snippet.

3. Once done, save the *task2_code.py* as #TeamID_PathPlanning.py. Put the Python code file in the #TeamID_PathPlanning folder.