

Back-End Developer – Case Study

General Criteria:

- Application needs to be developed in .Net Core.
- Unit test should be written for application.
- SOLID principles should be followed.
- Codes need to be added to a Github repository. A read permission need to be given to Gizil. (github.com/Gizil-Digital)

Code Review: Robot Vacuum Cleaner

A company is developing two new robot vacuum cleaners to navigate a rectangular room. The robots are equipped with sensors that allow them to detect the edges of the room and obstacles within it. The robots' position and orientation are represented by a combination of x and y coordinates and a letter representing one of the four cardinal compass points. The room is divided up into a grid to simplify navigation. An example position might be 0, 0, N, which means the robot is in the bottom left corner of the room and facing North. In order to control the robot, the user sends a simple string of letters. The possible letters are 'L', 'R', and 'M'. 'L' and 'R' make the robot turn 90 degrees left or right respectively, without moving from its current spot. 'M' means move forward one grid point in the current orientation. Assume that the square directly North from (x, y) is (x, y+1).

Input:

The first line of input is the size of the room, represented by two integers separated by a space, which correspond to the width and height of the room. The second line of input is the position and orientation of the first robot, represented by two integers and a letter separated by spaces, which correspond to the x and y coordinates and the robot's orientation. The third line of input is a string of instructions telling the first robot how to navigate the room. The fourth line of input is the position and orientation of the second robot, represented by two integers and a letter separated by spaces, which correspond to the x and y co-ordinates and the robot's orientation. The fifth line of input is a string of instructions telling the second robot how to navigate the room. The orientation is represented by a single letter ('N', 'E', 'S', or 'W'). The rest of the input is a string of instructions telling the robot how to navigate the room.

Output:

The output should be the final position and orientation of both robots after they have completed navigating the room.

Test Input:

5 5

1 2 N

LMLMLMLMM

3 3 E

MMRMMRMRRM

Expected Output:

1 3 N

5 1 E

Note: In this scenario, the robot vacuum cleaner starts at the initial position and orientation specified in the input. The 'L', 'R', and 'M' instructions indicate the robot should turn left or right by 90 degrees or move forward one grid point in the current orientation, respectively. Each robot will be finished sequentially, which means that the second robot won't start to move until the first one has finished moving. The robot will execute the instructions in sequence until it has completed navigating the room. Robots cannot move out of the grid area. The output should be the final position and orientation of the robot after it has completed navigating the room.