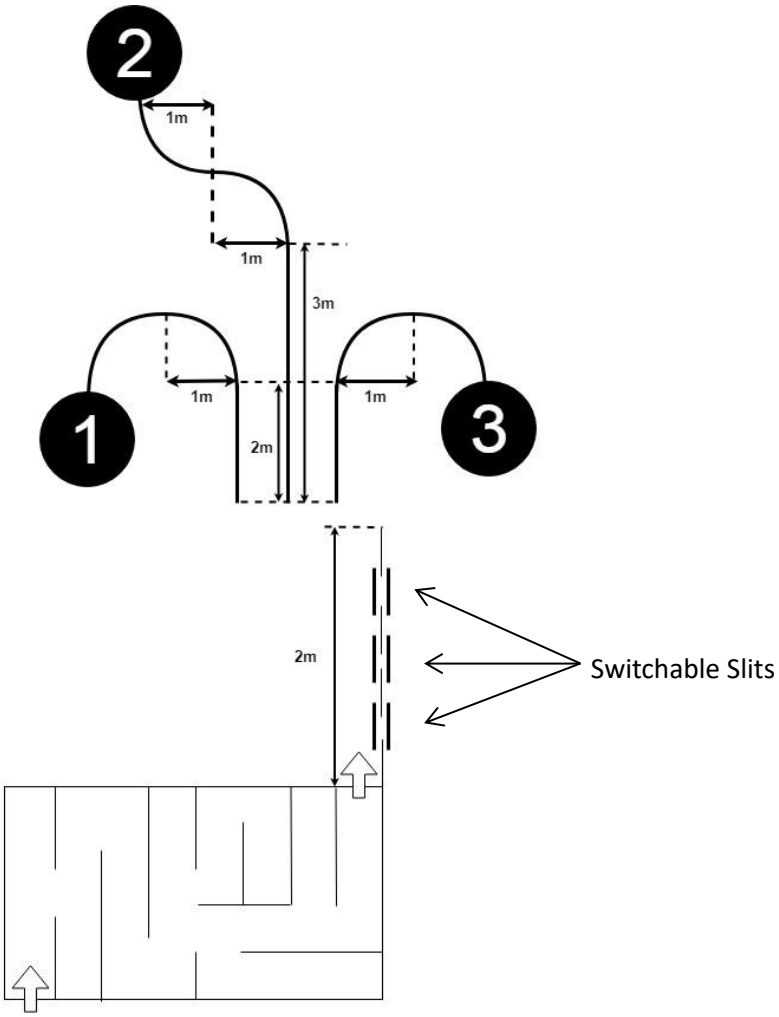
# IE4060 - Robotics and Intelligent Systems Assignment

**Semester 1 - 2024**

In this assignment, you will program a robot to complete a certain task. This is an individual project conducted in the class (normal lab hours) as well as outside the class.

Total Marks = 100

## Task



### Step 1

The robot has to navigate through the maze autonomously and find the exit point. You may use any algorithm to do this task. The width of the inside paths of the maze would be 10 inches wider than your robot. The maze may be slightly different at the final demonstration. Marks would be based on the time of completion of the maze.

$$Marks\ for\ Solving\ the\ Maze = \frac{20 \times t_{min}}{t}$$

$t = Time\ taken\ by\ your\ robot\ to\ complete\ the\ maze$

$t_{min} = Minimum\ time\ taken\ by\ a\ robot\ to\ complete\ the\ maze$

### Step 2

The robot may find a straight wall to its right, upon exiting the maze. The wall has three slits which could be opened or closed randomly when performing your demonstration. The robot must identify the number of open slits in the wall while navigating forward to reach the end of the wall.

### Step 3

There will be three non-overlapping paths at the end of the straight wall. The robot must choose the correct path based on the number of open slits detected in the straight wall.

Example: 1 Open slit detected → Choose path 1

The paths are not marked or guided by any means. The robot must be pre-programmed with all the three paths to follow the corresponding trajectory. Robot should be stopped within the marked parking zone after completing the trajectory.

### Marking Grid

| Component | Marks |
|---|---|
| Progress at the preliminary assessment | 10 |
| Smooth navigation within the maze | 05 |
| Solving the maze | 20 |
| Identifying the correct number of open slits | 10 |
| Following the trajectory accurately | 30 |
| Stopping within the parking zone | 05 |
| Verbal Explanation of the algorithms used | 10 |
| Quality of coding | 10 |
| **Total** | **100** |