

Vacuum Robot

SFWR ENG 3KO4 (Software Development)

McMaster University

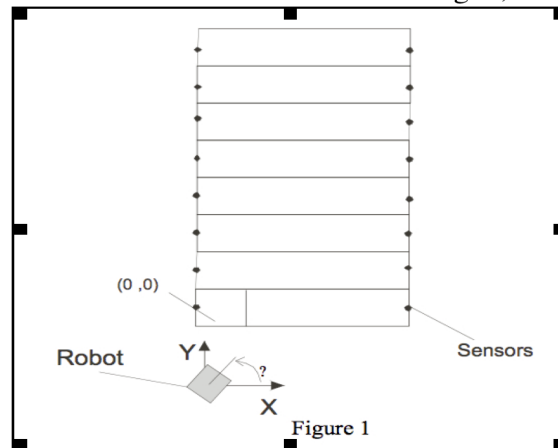
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A robot emulates a housekeeper to vacuum a square shape room.

Software requirement specification:

- The room is divided into N rows (Figure 1)
- Each row has two sensors; each sensor provides the following information upon the robot's contact to that sensor:
 - Whether the robot has hit the sensor by its side or its edge (i.e., the robot as tilted)
 - The row number
- The robot starts from the reference location in the room, i.e. **room(0, 0)**
- The robot swipes the room row wise
- It moves in the X (or $-X$) direction to the end of each row; moves to the next row (as "**new row**", see below); and then starts moving in the reverse direction
- Due to error in robot's controller it may be misdirected from the straight line
- Once the robot reaches the end of a row, a decision is made depend on the sensor's reading:
 - If it hits by its edge the correction is made to tilt the robot back to zero angel
 - If the new row number is equal to the last row number plus one, the robot starts swiping in the reverse direction
 - If the new row number is increased by more than one compared to the old row number, the swiping is restarted from **room(0,0)**
 - If the new row number is unchanged, robot should redo the current row.



“Vacuum Robot” State Chart

