

# Vacuum Robot

SFWR ENG 3KO4 (Software Development)

McMaster University

Instructor: Dr. Kamran Sartipi

By: Mahya Fotoohi (TA)

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.

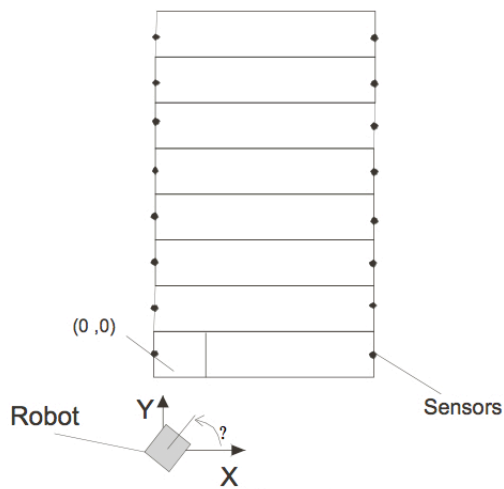


Figure 1