

# Robotics Engineer Task

NOTE: PLEASE READ THE ENTIRE TASK BEFORE STARTING

## Problem statement:

You are given an Omni directional robot with a square body. It has 4 wheels attached to 4 Motors (M1, M2, M3 and M4) at the centre of the edges of the square body. Each wheel has a diameter of 5 cms. The motor rotates one rotation per for 2000 pulses.

The robot also has 2 distance measurement sensors S1 and S2. Both are placed at the front face of the robot, 30 cms apart from each other. These sensors measure the distance of the robot from a wall in front of it.

Distance between M1 and M2 is 30cms, between M3 and M4 is 30cms. Look at Figure1 to get idea of motor and sensor placement on robot.

## Question 1:

Design a code to read sensor values from CSV file, first column is for sensor 1 and the second column is for sensor 2. Calculate the angle the front face of the robot makes with the wall. Create a "output.csv" file and write the angle in first column.

NOTE: Input is in cms. Output MUST BE in degrees

## Question 2:

Once you have calculated the angle made by the robot to the wall, calculate the number of pulses are to be given for M1, M2, M3 and M4 to rotate the robot to maintain parallelity with the wall. In "output.csv" file, write M1, M2, M3 and M4 pulses in column 2, 3, 4, 5 and in column 6 write the direction of the Bot to rotate (direction from the top view of the robot)

NOTE: Output MUST BE number of pulses, Direction (clockwise or counterclockwise)

## Question 3:

After making robot parallel to wall, find the number of pulses are to be given for M1, M2, M3 and M4 so that it will arrive at 30cms from the wall, write values in Column 7, 8, 9 and 10 respectively and in column 11 write the direction.

NOTE: Output MUST BE number of pulses, Direction (clockwise or counterclockwise)

KEEP IN MIND:

- Your code should be able to plug and play with multiple values of distances.

- Submit your programming solution along with “output.csv” file.

The Header for input.csv files is

S1 Distance from wall	S2 Distance from wall
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Header for output.csv file is

Angle	M1 Ticks	M2 Ticks	M3 Ticks	M4 Ticks	Directi on	M1 Ticks	M2 Ticks	M3 Ticks	M4 Ticks	Directi on
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