Assessment for the Position of ROS Developer

Introduction

The purpose of this assessment is to determine whether you have the necessary knowledge and expertise to contribute to our company's success. This assessment will consist of a task that will test your coding skills. We encourage you to take your time and do your best.

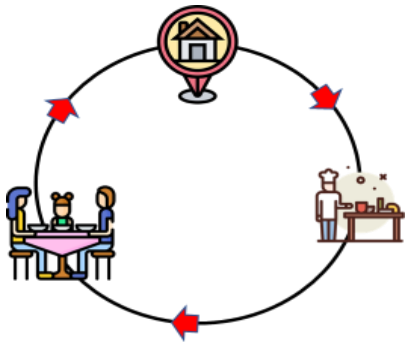
PROBLEM STATEMENT:

The French door café has asked us to build a robot that will be used as a butler. The orders are taken from the customers by the host of the restaurant and will be passed on to the kitchen to make them ready. Once the food is ready the butler will collect the food and give it to the customer who has ordered the food. Now the restaurant becomes busy and the cost of the employees are shooting up. To find a solution for it they have approached us.

We are going to give a solution for the same with our robot. We will be able to handle a busy day by replacing the butler with a robot. The robot will run the errands faster and in a more efficient way.

Our robot's general workflow will be as follows, our robot will be in the home position initially. When the order is received by the robot, it will travel to the kitchen to collect the food that has to be delivered and move to the customers table for the delivery of the food. Once the order is completed the robot will move to its initial home position.

This café expects us to manage the delivery for 3 tables (table1, table2, table3).



We expect the robot to handle the following situation,

1. When an order is received with the table number, the robot should move from its home position to the kitchen and move to the table for the food delivery. After completion of that task the robot should return to the home position. (No confirmation is required either from the kitchen or customer table. Getting input from the table or kitchen is your choice.)
2. When an order is received with the table number, the robot should move from home to start its task. If no one attends the robot, it will wait for Confirmation (either in kitchen or table), the robot should return home after timeout.
3. When an order is received with the table number, the robot should move from home to start its task. We need to handle the following scenario
    a. It will reach the kitchen for the food and if no confirmation is given to the robot it should move to the home position after timeout.
    b. If the food is received from the kitchen, it reaches the table. No one is giving confirmation to the robot from the table, then the robot will move to the kitchen first before going to the home position.
4. When an order is received with the table number, the robot should move from home to start its task. If a task is canceled while going to the table, the robot returns to the kitchen and then to home and if canceled while going to the kitchen, the robot will return to home.
5. When multiple orders are received with the table numbers, the robot should move from home position to kitchen to collect the orders and move to multiple tables for the food delivery. After completion of that task (delivery of all the tables) the robot should return to the home position.
6. When multiple orders are received with the table numbers (let us assume table1, table2, table3), the robot should move from home position to kitchen to collect the orders and move to multiple tables for the food delivery. When no one confirms in table1 the robot should move to the next tables (table2, table3) for delivery. After finishing the delivery of the final table, the robot goes to the kitchen before going to the home position.
7. When multiple orders are received with the table numbers (let us assume table1, table2, table3), the robot should move from home position to kitchen to collect the orders and move to multiple tables for the food delivery. The order of the particular table (table2) is canceled, the robot should skip that table (table2) and deliver to the other tables (table1, table3). After finishing the delivery of the final table, the robot goes to the kitchen before going to the home position.

ASSUMPTION AND POINTS FOR EVALUATION

1. We expect the code to run in ROS environment
2. We expect that the code to be pushed in GitHub
3. We love ROS, So expecting you to as much as ROS concepts
4. We wish a generic approach not a hardcoded algorithm
5. We like your codes to be very clean and lean.
6. Document all your progress. We prefer a technical documentation approach. Document the code used. Also explain your approach throughout the process to achieve required goals in detail. We don't have any stringent guidelines for documentation. Just make sure you are able to showcase your work in an understandable manner.
7. It is preferred that code is as optimized as possible.
8. We expect proper git push and Documented approach for each milestone
9. We respect everyone's individuality so let your code be yours

JUDGING AND SELECTION

1. Maximum milestones you cross maximum your chance of selection.
2. We value your documentation and approach you follow to cross each milestone. So not only milestone matters but the approach and genericness also matters
3. We highly value your innovational approach
4. Presentation matters...! So present your output in a unique way.