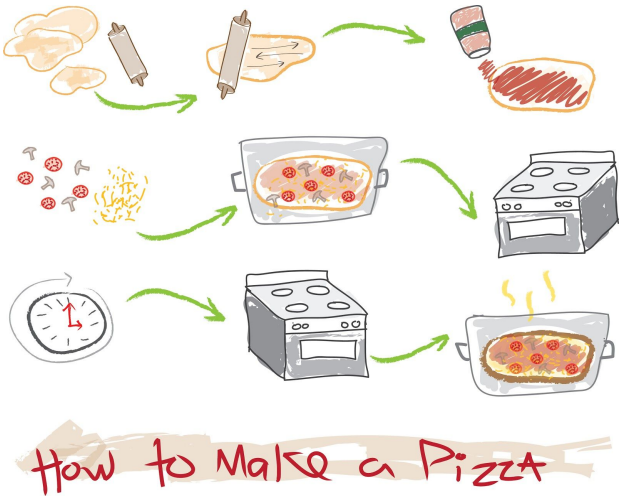
REMY Robotics

Test Task

You are asked to design and implement a system based on ROS that plans and executes steps of making a pizza in a robotic restaurant.



From the physical perspective the system should consist of:

- A robot that is capable of executing the following list of tasks:
  - Make a crust from a dough
  - Spread evenly tomato sauce on a crust
  - Add the right amount of cheese, pepperoni, and mushrooms on top of tomato sauce
  - Place a pizza into an oven
- A robot after the oven which is able to:
  - Pick pizza from an oven
  - Slice it into 8 pieces
  - Pack pizza into a box
  - Place pizza boxes from the same order to the same shelf on top of each other
- Multiple cameras and sensors, that are used together with machine vision algorithms to provide robots understanding of the real world and assess quality of each step of cooking

You can assume that the only difference between the robots is a list of responsibilities and a set of tools available to them. The system should support adding new robots easily to increase throughput of the restaurant.

Briefly describe your design and answer the following questions:

- How would you design the system architecture in terms of planning, execution, and behaviour?
- Does this design help adding new robots easily?
- In the proposed system architecture how would you design a retry feature? For example, if a robot fails to pick a pizza from an oven it retries picking it 3 more times before raising an alarm for a human operator?
- Do you think the system should be able to react to the environment in real time? Explain why and how the proposed design addresses these challenges

Implement the skeleton of your design to prove that it is technically sound and feasible.