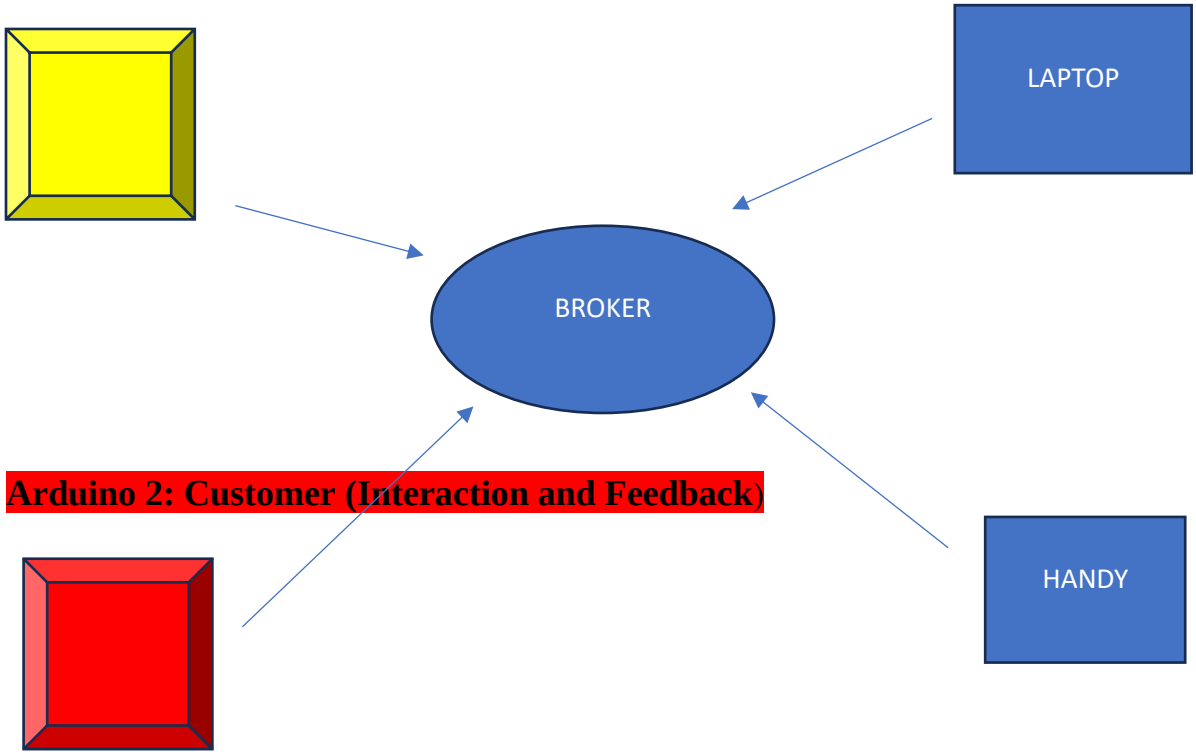
THE SMART RESTAURANT ROBOT SYSTEM

Use Case Description

The smart restaurant robot serves as an autonomous waiter that can navigate the restaurant, collect environmental data, interact with customers, and ensure optimal dining conditions. The robot communicates with two Arduino clients placed in different sections of the restaurant, and the data is managed via the MQTT broker on the Raspberry Pi.

Arduino 1: Environment Monitoring and Control Robot



Arduino 2: Customer (Interaction and Feedback)

Arduino 1: Environment Monitoring and Control Robot

Components:

- **KY-015 Combi-Sensor (temperature & humidity)**
- **KY-018 Photoresistor**
- **KY-019 5V Relay**
- **KY-050 Ultrasonic distance sensor**

Functions:

1. **Temperature and Humidity Monitoring**
    - Using of the KY-015 sensor to monitor temperature and humidity.
2. **Light Level Monitoring**
    - Using of the KY-018 Photoresistor to monitor the ambient light level.
3. **Automatic Lighting Control**
    - Using of the KY-019 relay to control lights based on light level data.
4. **Table Occupancy Detection**
    - Using of the KY-050 Ultrasonic distance sensor to detect if a table is occupied.

Arduino 2: Customer (Interaction and Feedback)

Components:

- **KY-022 Infrared receiver**
- **KY-037 Microphone sound sensor**
- **KY-004 Button**
- **KY-006 Passive Piezo-Buzzer**
- **KY-016 RGB 5mm LED**

Functions:

1. **Customer Order Collection**
    - Using of the KY-022 infrared receiver to receive remote control signals for order collection.
    - Using of the KY-037 microphone to detect voice commands.
2. **Customer Feedback Collection**
    - Using of the KY-004 button for customers to provide feedback after receiving their order.
3. **Alert and Notification System**
    - Using of the KY-006 Passive Piezo-Buzzer to notify customers or staff of certain events (e.g., order confirmation, feedback received).
4. **Status Indicator**
    - Using of the KY-016 RGB LED to indicate different statuses (e.g., idle, processing order, awaiting feedback).