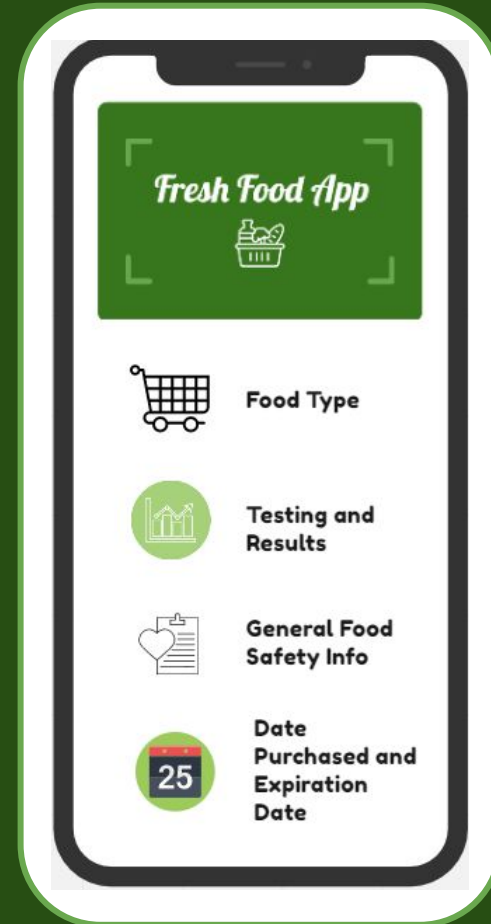


Fresh Food App

Group 27 members: Wasay Ahmed (wahmed9), Christian Gutierrez (cgutie38), Jordan Nguyen (jtn3), Natalie Reyes (nreyes28)

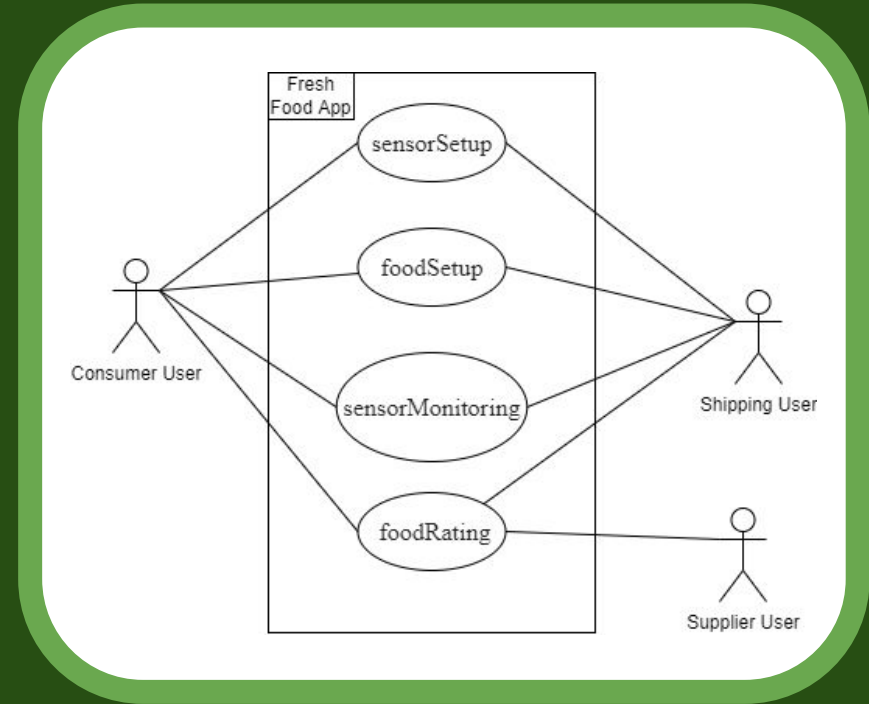
Project Description

- Provides the user with information on food edibility
- Separate hardware is used to test food item
- Sensors built in the hardware will collect data on chemical odors read
- App will calculate edibility and estimate expiration from real time data sent by the sensors
- Purpose:
 - Reduce food waste
 - Increase food safety
 - Reduce the emissions of greenhouse gasses.



Use Case Diagram

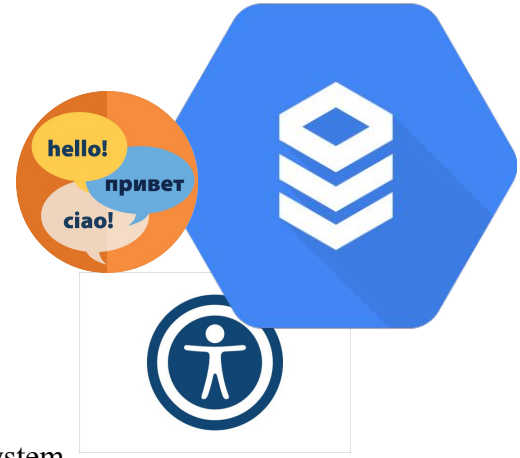
1. **Sensor setup:** press “Sensor Setup” button, install sensors (test using Bluetooth or wifi), calibrate, press “Finish Setup” button.
2. **Food setup:** press “Food Setup” button, input food, place food near sensor, and press “Finish Setup” button.
3. **Sensor Monitoring:** press “View Food Monitoring” for data predictions, on date of expiration gives user a notification to dispose food, press “Stop Monitoring” once food is gone, new notification to start new Food Setup.
4. **Food Rating:** User leaves review to supplier, finish by pressing “Submit Review”



Use Case diagram of Fresh Food App.

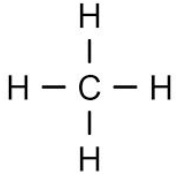
Requirements

- All users must learn to navigate application and choose food to test.
- Transporter tests during transportation checking supply and reporting to supplier.
- Consumer and supplier can view food safety info, estimated expiration , and access rating system.
- Cloud database updated frequently for user and food item information.
- Will have option to translate into other languages but English will be the default.
- ADA Compliant.
- We have all users sign terms and conditions that show our app is not liable for any damages that are caused by spoiled food not identified by the app.

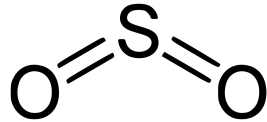


Requirements

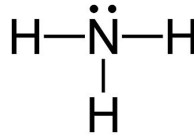
- Sensor Requirements
 - Different types of foods emit different gases when they begin to spoil.
 - Sensors must accurately detect gases for predictions (Ammonia, Methane, and Sulphur).
 - Sensors must measure environment conditions (Temperature and Humidity).
- Data Requirements for Predictions
 - Previous gas and environment measurements of spoiling food need to be collected.
 - Real time measurements must then be compared with standardized data to make predictions.
 - Predictions should also be calculated with only real time data measurements.



Methane



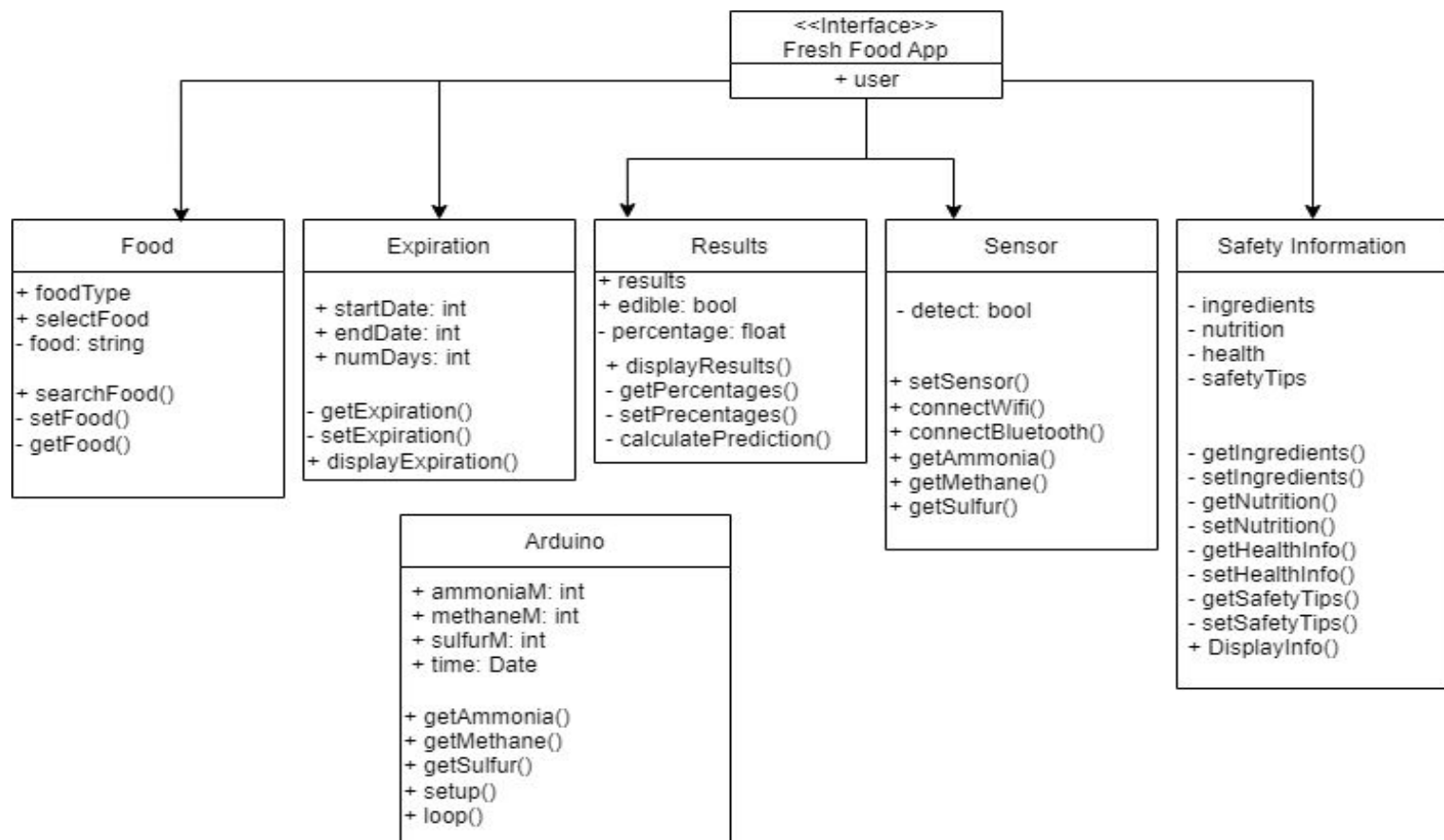
Sulfur Dioxide



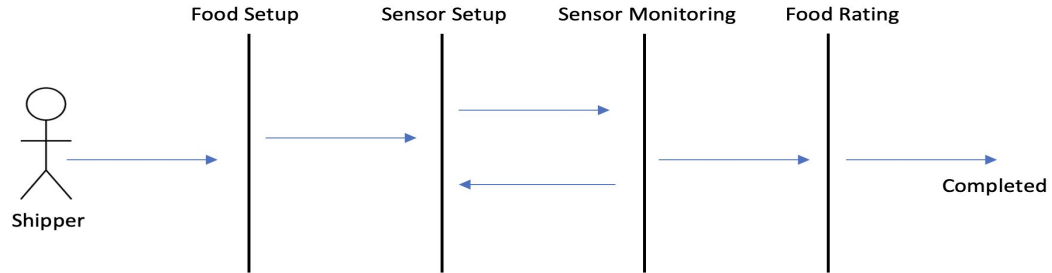
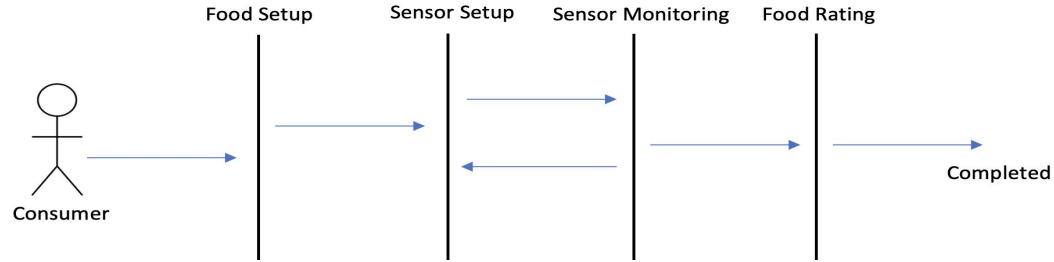
Ammonia



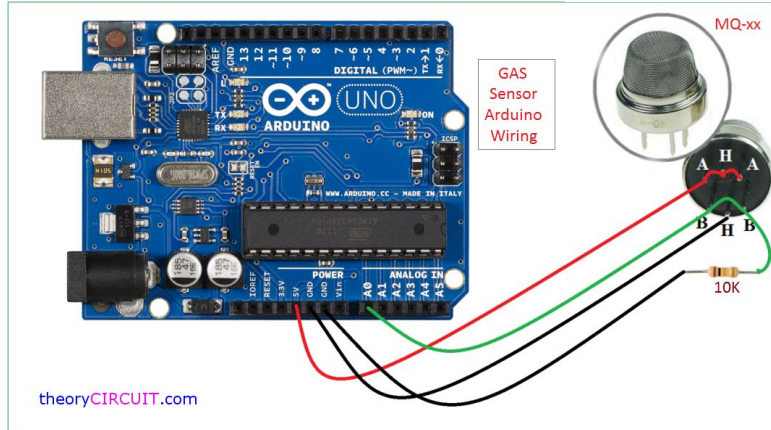
UML












Sequence Diagrams



Design



 MQ-2 Combustible gas,Smoke	 MQ-3 Alcohol	 MQ-4 Methane,Propane,Butane
 MQ-5 Methane,Propane,Butane	 MQ-6 liquefied petroleum butane , propane , LPG	 MQ-7 Carbon Monoxide
 MQ-8 Hydrogen	 MQ-9 Carbon monoxide,Methane	 MQ-135 Ammonia sulfide,Benzene vapor



- Arduinos with MQ series gas sensors for measurements. Send data over Bluetooth or WiFi.
- Python or Arduino C++ to retrieve data and calculate predictions. Send to database and app.
- Cloud database to store and easily access all data from any device.
- Android or iOS app with a nice UI to monitor their food. Should receive sensor data directly.

Project Issues



- Arduino
 - Sending data over bluetooth from an arduino to an app might be difficult.
 - Future developers should consider separate systems for arduino and app.
 - Only share cloud database.
- Container
 - Some gases are lighter than air and rise to the top (Ammonia and Methane).
 - Sensors in an open environment might not measure them accurately.
 - Smaller enclosed containers should be considered and tested to standardize measurements.
 - Buildups and escapes of gases must be factored in prediction calculations.
- Types of Gas Emissions
 - Not all gases emitted are pure ammonia, sulphur, and methane.
 - Sensors should be able to detect all necessary variants of gases emitted for accurate predictions.

Thank You!

Fresh Food App

