

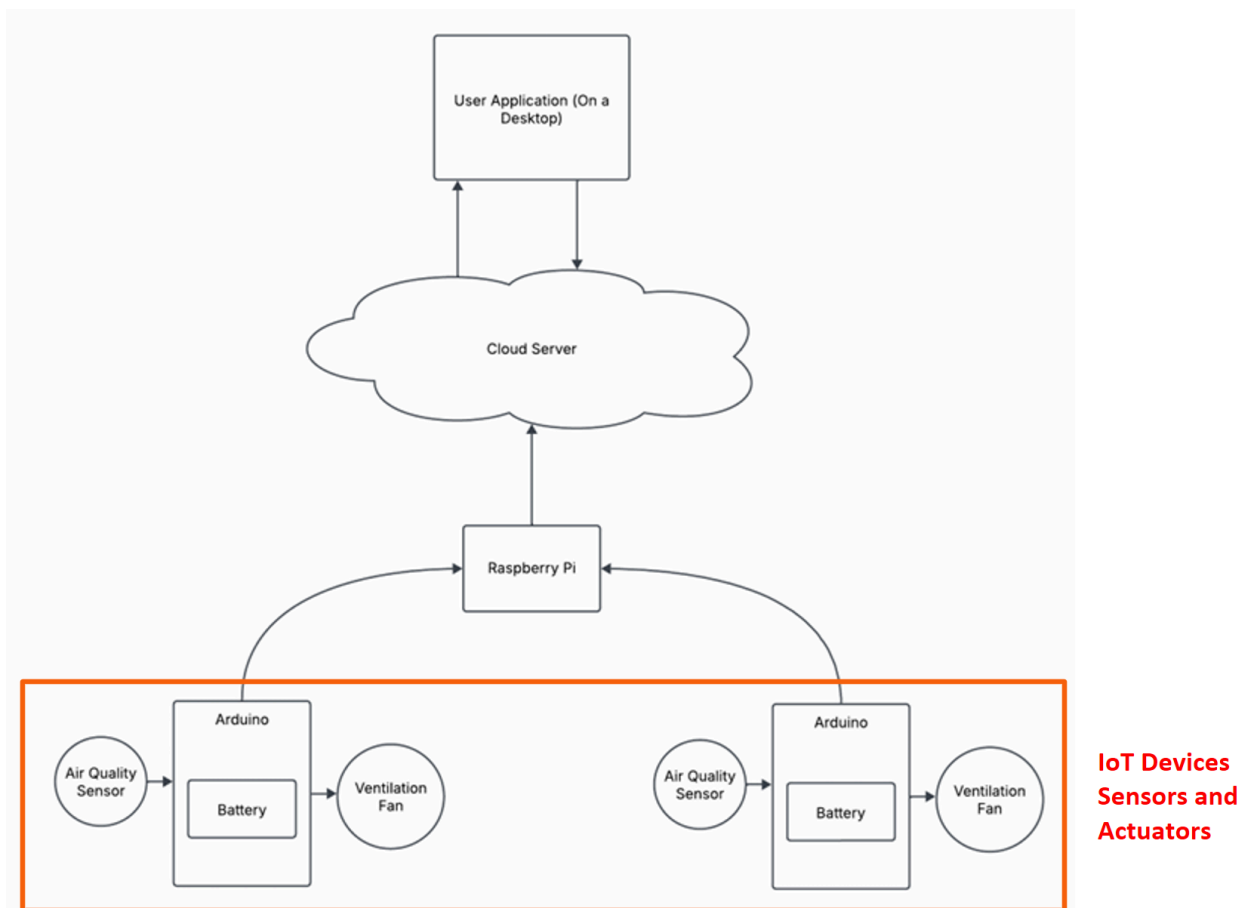
## ECE1528 Term Project

**Project Name:** Smart Kitchen Air Quality Monitoring and Controlling Ventilation System

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### Completed Tasks:

1. Purchased and ordered the required hardware through Creatron. These are all the parts that make up the **IoT Devices (sensors and actuators)** portion of the project
  - a. Mini Breadboard (White)  $\times$  2
  - b. 9V Battery  $\times$  2
  - c. 9V Battery Enclosure with Switch  $\times$  2
  - d. PN2222 NPN BJT (40V 1A) (2 Pack)  $\times$  1
  - e. 1N4002 Rectifier Diode (100V 1A) (4 Pack)  $\times$  1
  - f. 2N2222 NPN BJT (40V 0.8A)  $\times$  3
  - g. 5V DC Brushless Fan (30x30x10mm)  $\times$  2
  - h. MQ-9 Carbon Monoxide & Flammable Gas Sensor  $\times$  2
  - i. MQ-135 Air Quality Sensor  $\times$  2



2. Researched and found Arduino Libraries required:
  - a. MQ-135 Air Quality Sensor Library:

- i. <https://github.com/AmanSCoder/MQ135/tree/main>
  - b. MQ-9 Sensor Usage:
    - i. <https://www.instructables.com/How-to-Calibrate-Use-MQ9-Gas-Sensor-W-Arduino/>
  - c. LCD Screen Usage:
    - i. ECE1528 Lab 1
    - ii. <https://github.com/tubskns/notelab-code/blob/master/arduino/actuators/LCD/LCD.ino>
- 3. Controlling 5V Fan using Arduino
  - a. Connect fan to Vin (5V) pin of Arduino and NPN Transistor to turn On/Off voltage supply
    - i. <https://forum.arduino.cc/t/switching-a-cooling-fan-on-and-off-through-npn-transistor-connected-to-arduino/512176>
- 4. Worked on identifying the specific tools to use for running Streamlit UI on GCP. This can be done by deploying a docker image into Google Cloud Run which can take in the incoming queue of data and display the information on the Streamlit application. This has been tested locally, but we need to deploy to GCP to test it out. The source we will be using is:
  - a. <https://www.youtube.com/watch?v=-0l8dN2Fvks>

#### **Remaining Tasks to Complete:**

- 1. Sensor Controller (MQTT/AMQP communication for MCU and RPI)
- 2. Data pipeline (AMQPbroker-to-HTTPserver)
- 3. Actuator controller (HTTP server/AMQP broker-to-MQTT broker)
- 4. Onboarding the docker image into GCP and setting up Cloud Run.