IOT & EMBEDDED SYSTEMS

PROJECT PROPOSAL

WEATHER MONITORING STATION

23-NTU-CS-1080
23-NTU-CS-1054
23-NTU-CS-1067

PROJECT TITLE

Name: *Live Weather Monitoring Station*

GROUP MEMBER

1. 23-NTU-CS-1080 -> Muhammad Zohaib Warraich
2. 23-NTU-CS-1054 -> Muhammad Umair
3. 23-NTU-CS-1067 -> Muhammad Hanzala Zahid

1. Hanzala Zahid

Responsibilities:

- He will be connecting all the sensors with ESP32 like DHT11,MQ-135,BMP180,UV Sensor, Rain Sensor.
- He will create the wiring and circuit diagram of our project.
- He will test and calibrate each sensor to make sure that all the readings are accurate.
- He will handle hardware troubleshooting and will fix unstable readings.

2. Muhammad Umair

Responsibilities:

- He will Configure ESP32 Wi-Fi and connect the cloud platforms (ThingSpeak / Blynk) to send weather data and watch it from anywhere using the internet.
- He will set up dashboards, graphs, gauges, and visualization widgets.
- He will also implement the Email Alerts System for:
  - High temperature
  - Heavy rain
  - Poor air quality
- He will also prepare the entire project proposal and documentation regarding our project.

3. Muhammad Zohaib Warraich

Responsibilities:

- He will write the complete ESP32 code (sensor readings + data formatting + cloud upload).
- He will also define some threshold values for alerts and implement alert logic in case of sensitive condition.

- He willmake sure that data is smooth to reduce noisy sensor readings.
- He will work on Firebase + custom web application if required but it is optional.
- He will perform serial debugging and optimize the performance of the code.

HARDWARE COMPONENTS

1. Microcontroller

- ESP32 Development Board

2. Sensors

- **DHT11:** Temperature and Humidity Sensor
- **MQ-135**: Air Quality
- **BMP180**: Atmospheric Pressure Sensor
- **GUVA-S12D**: UV Index Sensor
- **YL-83:** Rain Detection Sensor

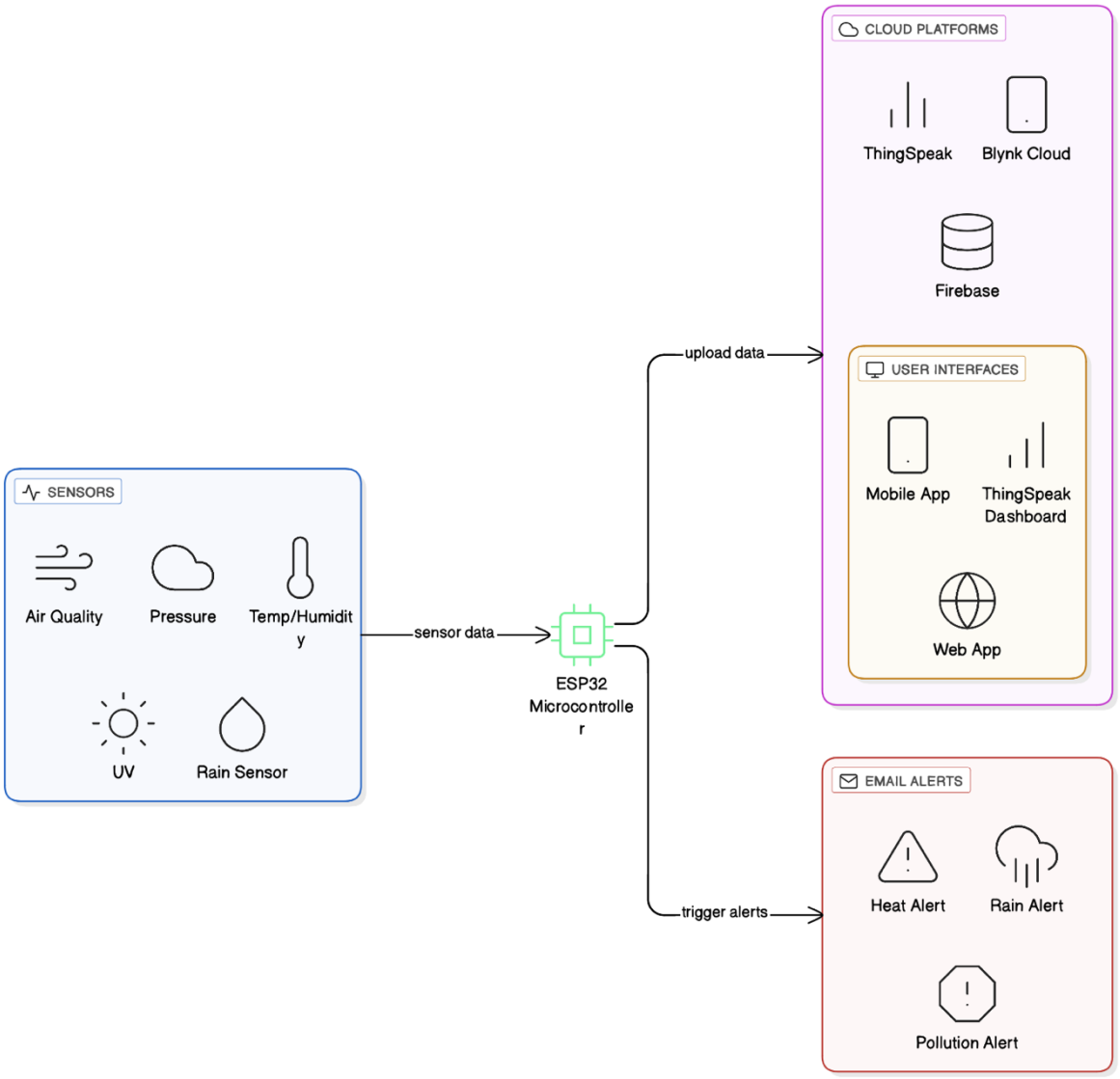
3. Power & Connectivity Components

- **USB Cable**
- **Jumper Wires**
- **Breadboard**
- **5V Power Supply OR Adapter**

SOFTWARE STACK

- Platform IO
- VsCode IDE
- Interface e.g ThingSpeak Web / Blynk IoT Mobile App
- E-mail alerts

SYSTEM DIAGRAM


CLOUD PLATFORMS
ThingSpeak
Blynk Cloud
Firebase
upload data
USER INTERFACES
Mobile App
ThingSpeak Dashboard
Web App
SENSORS
Air Quality
Pressure
Temp/Humidity
sensor data
ESP32 Microcontroller
UV
Rain Sensor
EMAIL ALERTS
Heat Alert
Rain Alert
trigger alerts
Pollution Alert