Digital Lab Mini-Project

CS227- Digital Systems

Internet Connected Weather Station

- Team Serial Number:- 21
- Team Members:-
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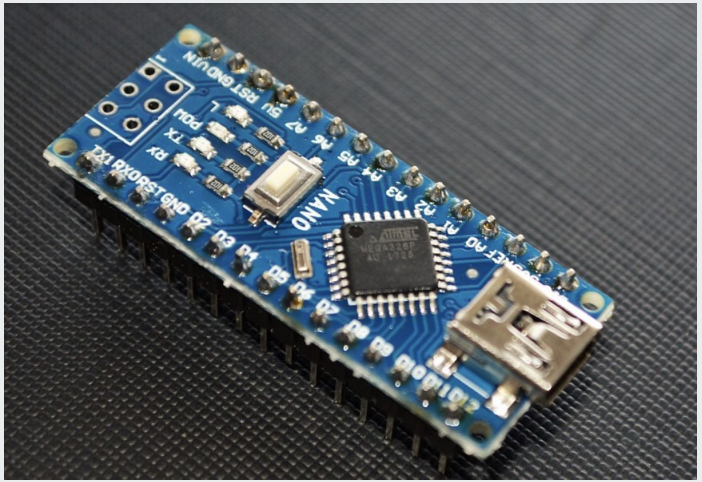
Objectives

- Connect Arduino-BME with the OLED to report the temperature, pressure and humidity in surroundings of sensor on the OLED to verify if the sensor is working
- Integrate Blynk cloud via WiFi to report the same on the app interface created on Blynk platform

Components taken

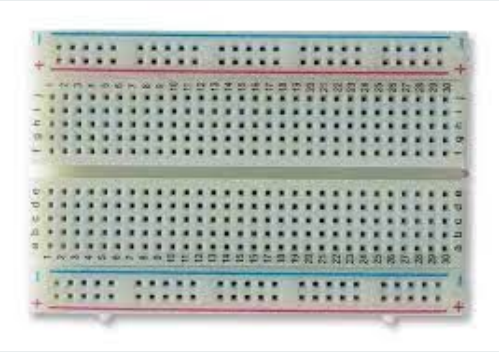


Arduino nano 33 IoT

BME 280 sensor

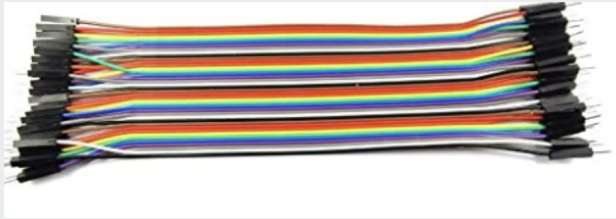
0.96 OLED Display - 128x64

Other components

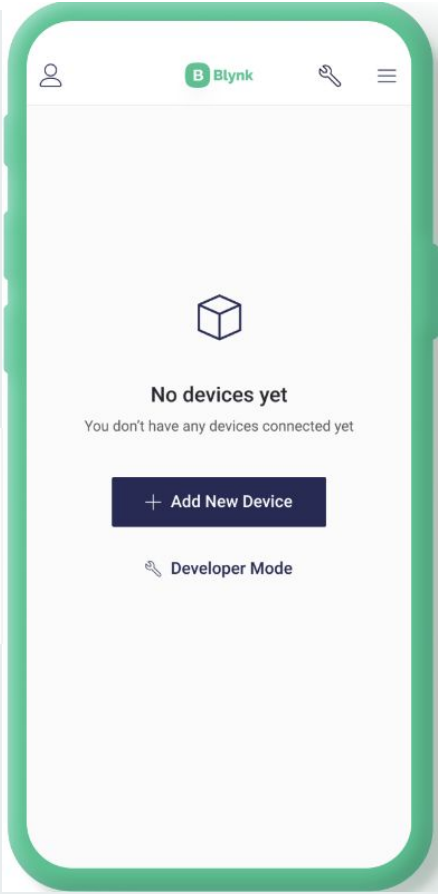


Breadboard

Micro-USB to USB



Jumper Wires

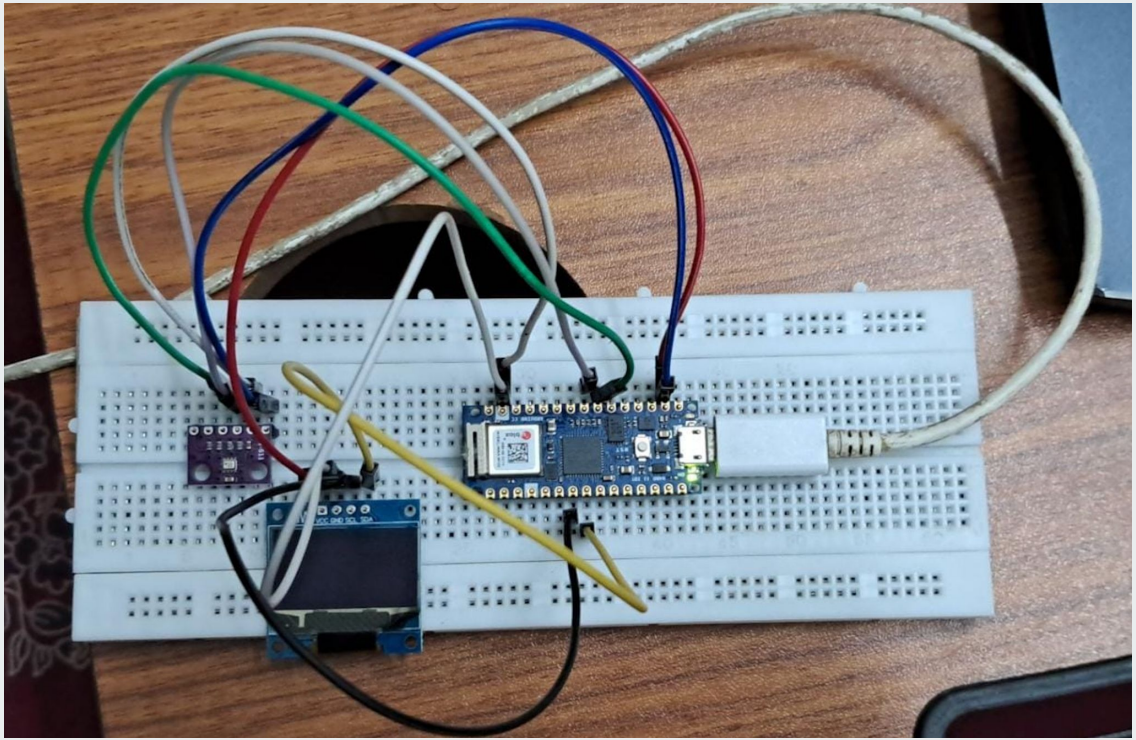


Smartphone with Blynk

SetUp-OLED

1. Connect the Arduino Nano 33 IoT with BME sensor and OLED display using jumper wires on the breadboard
2. Write the required Arduino code for displaying temperature, pressure and humidity on OLED
3. Upload the code to Arduino Nano 33 IoT to display on OLED
4. Verify the same on serial monitor in Arduino IDE

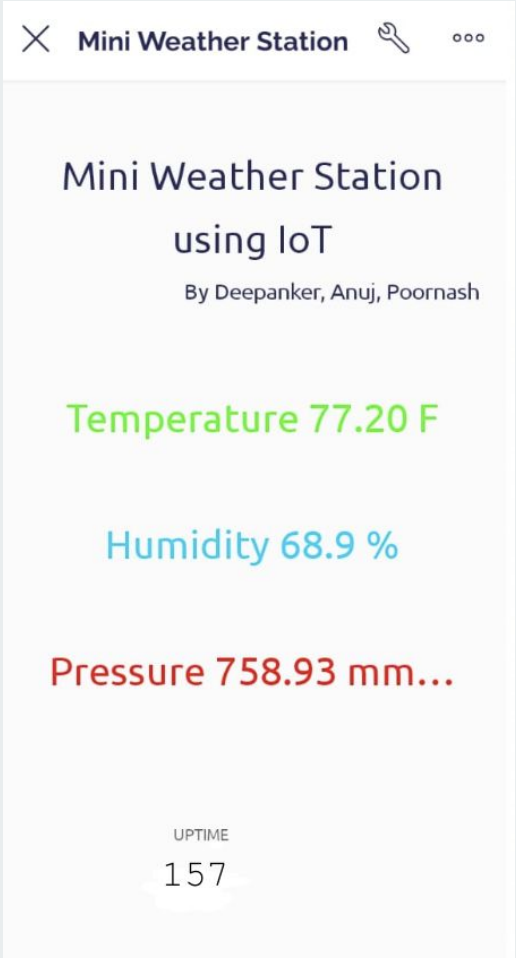
Circuit



SetUp-Blynk

1. Write the required code to connect with Blynk cloud and to show the temperature, humidity and pressure on Blynk app
2. Upload that to Arduino Nano 33 IoT
3. Connect the Arduino Nano 33 IoT with the Blynk cloud via WiFi
4. Make the interface for the setup on Blynk platform and connect that with the required Blynk cloud database.
5. Now the connected app is operational and weather conditions get updated there on interface in Blynk app.

Blynk Interface



Working

- BME takes in the input of weather conditions such as temperature, humidity and pressure from its surroundings and upload that to the Arduino Nano 33 IoT
- The Arduino Nano 33 IoT later uploads that to the OLED display and hence the conditions get displayed there and we verify them using serial monitor on Arduino IDE
- Later we disconnect the OLED and modify the code accordingly for connecting it with Blynk app via WiFi to Arduino Nano 33 IoT
- We upload the code and connect the Arduino with Blynk cloud through WiFi and Arduino uploads the weather input taken from the BME sensor to the Blynk cloud
- Using the interface created on the app, it displays the temperature, pressure and humidity on the connected app in Blynk cloud and we verify the same on serial monitor

Use in context of Smart City

- The app can be used to to take care of plants by sending the information on mobile and adding alerts if the surrounding condition become unfit for them, that measures can be taken to protect the plant.
- It can help to check the weather conditions in rooms or halls so they it be updated for comfort
- Since the app is shareable, the conditions can be examined through long distances
- In the end, we got a working weather station at a reduced cost!

Some Advanced Uses

- At larger scale, it can be used to provide early warnings before certain disasters
- Using database systems, it can be used to store the weather conditions overtime for proper analysis of weather and future planning