My Internship Project

A Prototype.

Who am I?

- Shashank
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- A Summary On my project to create the first prototype.

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Introduction

We at Lanware Solutions LLC felt the need to better integrate our IoT products with Customers expectation and decided to open a Project to display the telemetry data of their devices at their fingertips with 3D Models in Mixed Reality (Augmented Reality) So, they could manipulate it as they pleased. Here is the synopsis of said Prototype in the following slides.

Prototype

Components Required

For Hardware part of the prototype, you’ll need

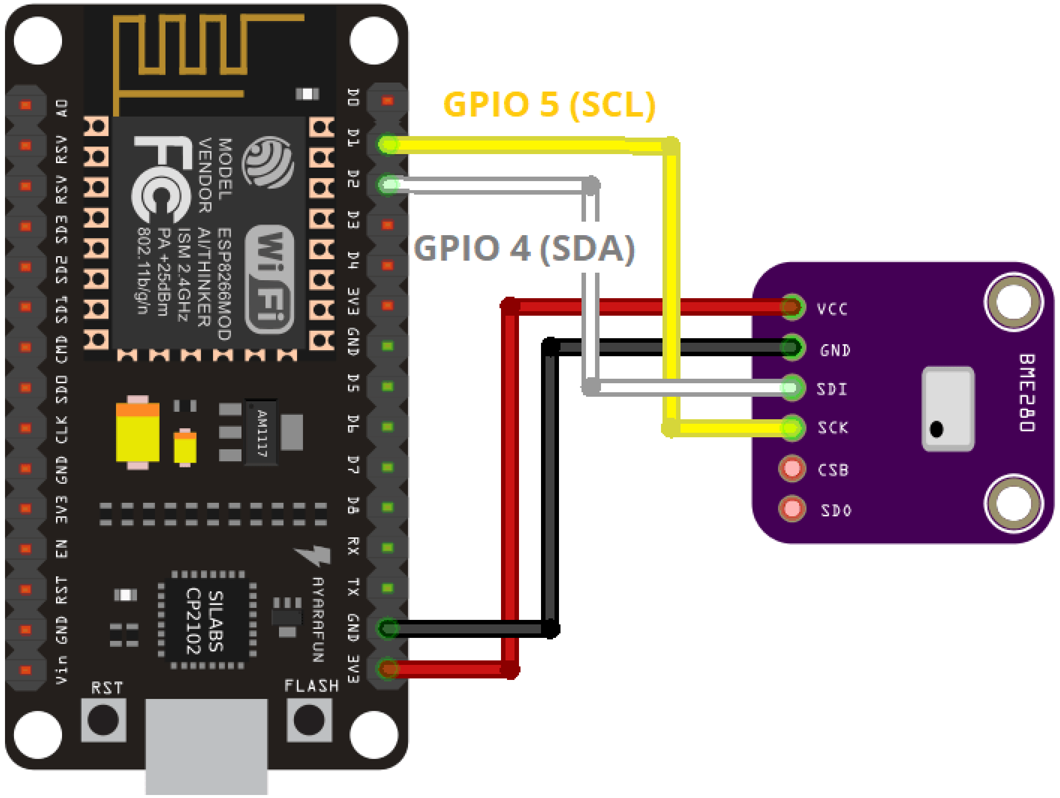
- ESP32 / NodeMCU board
- BMP/BME 280

For Software part you’ll need

- Blynk App
- Unity Hub
- Arduino IDE and the necessary libraries

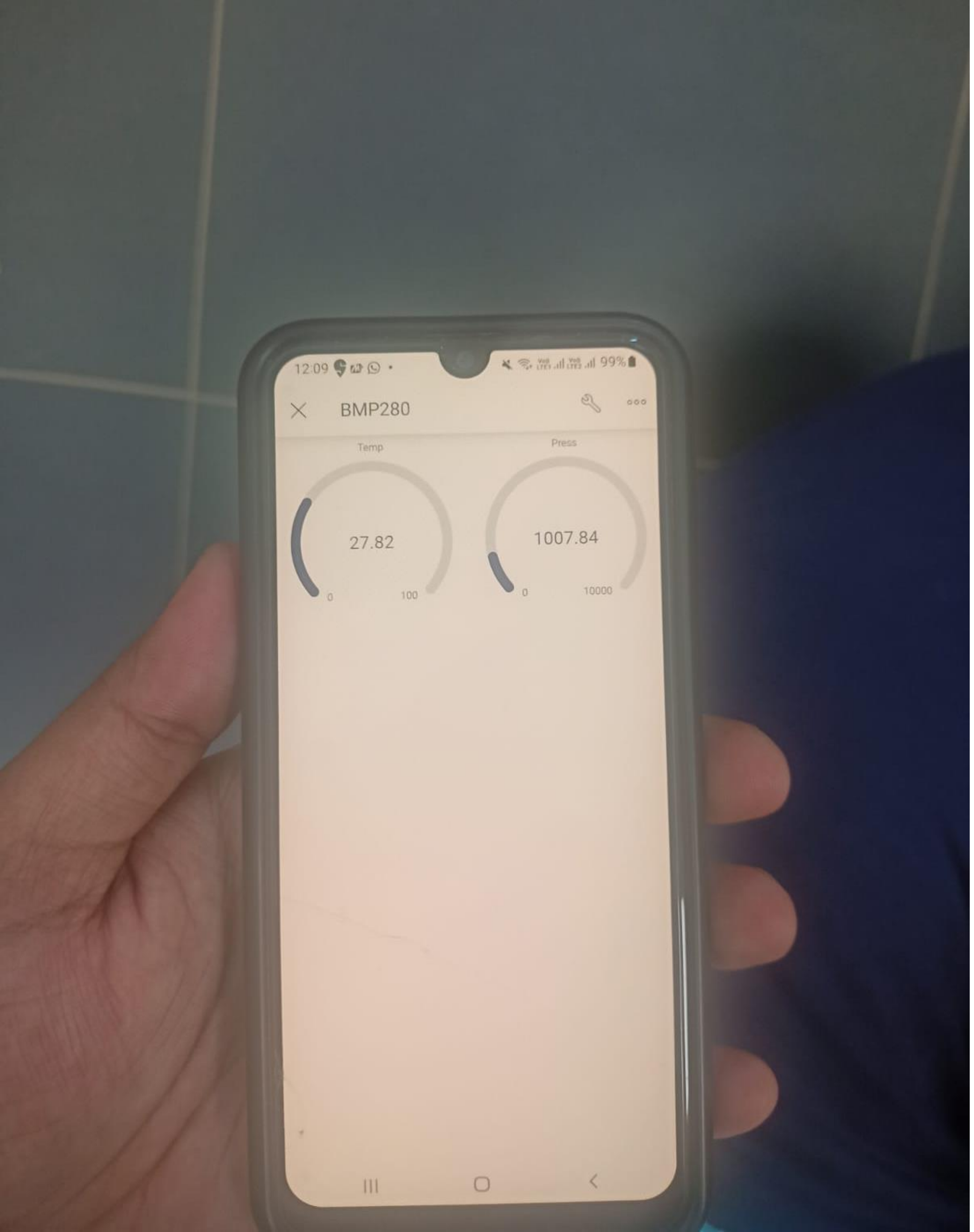
For the 3D model part, you'll need

- Unity Hub
- Unity Editor
- Vuforia Engine



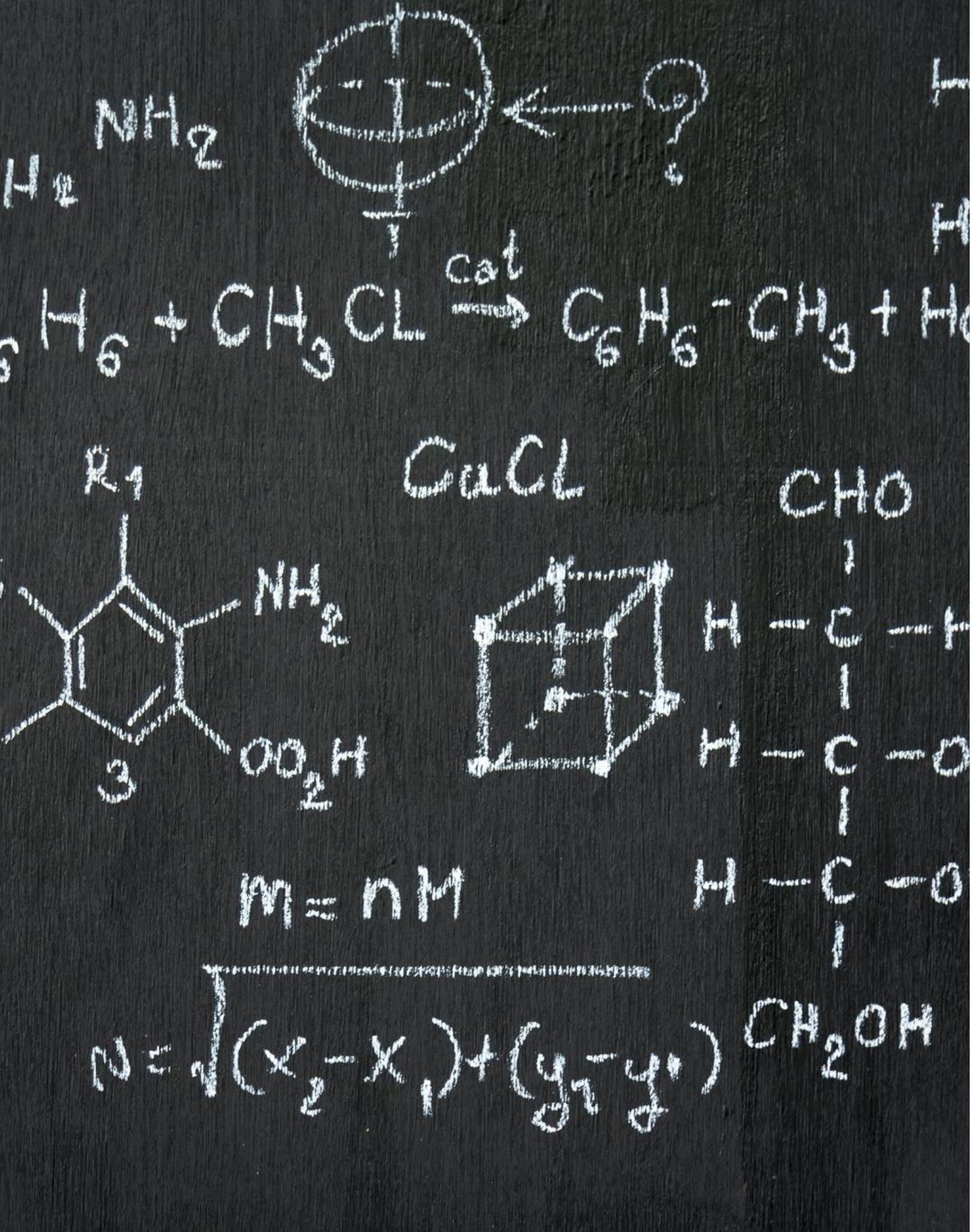
GPIO 5 (SCL)

GPIO 4 (SDA)



Prototype : Cloud

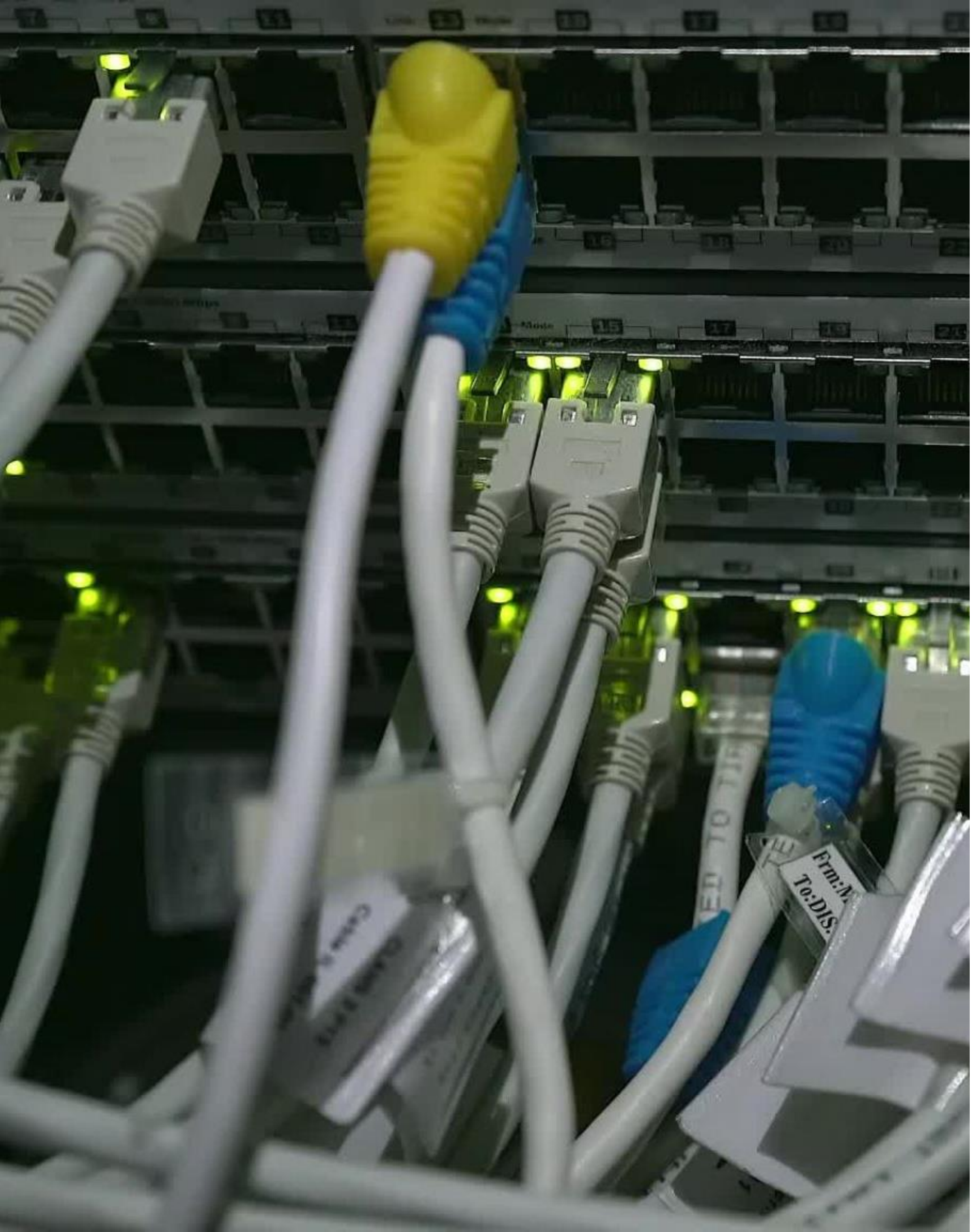
For the IoT Cloud part, I have used Blynk IoT Platform. In which, I just made a simple blynk project of displaying Temperature and Atmospheric pressure data using Gauge widget. Here the temperature data is stored in virtual pin V1, and Atmospheric pressure is stored in virtual pin V2.



Prototype : ArduinoIDE (Arduino C)

- **The Headers and Libraries used are as follows:**

```
#define BLYNK_TEMPLATE_ID "TMPLGtOr80uQ"
#define BLYNK_DEVICE_NAME "BMP280"
#include <farmerkeith_BMP280.h>
#include <Wire.h>
#include <Blynk.h>
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>
```

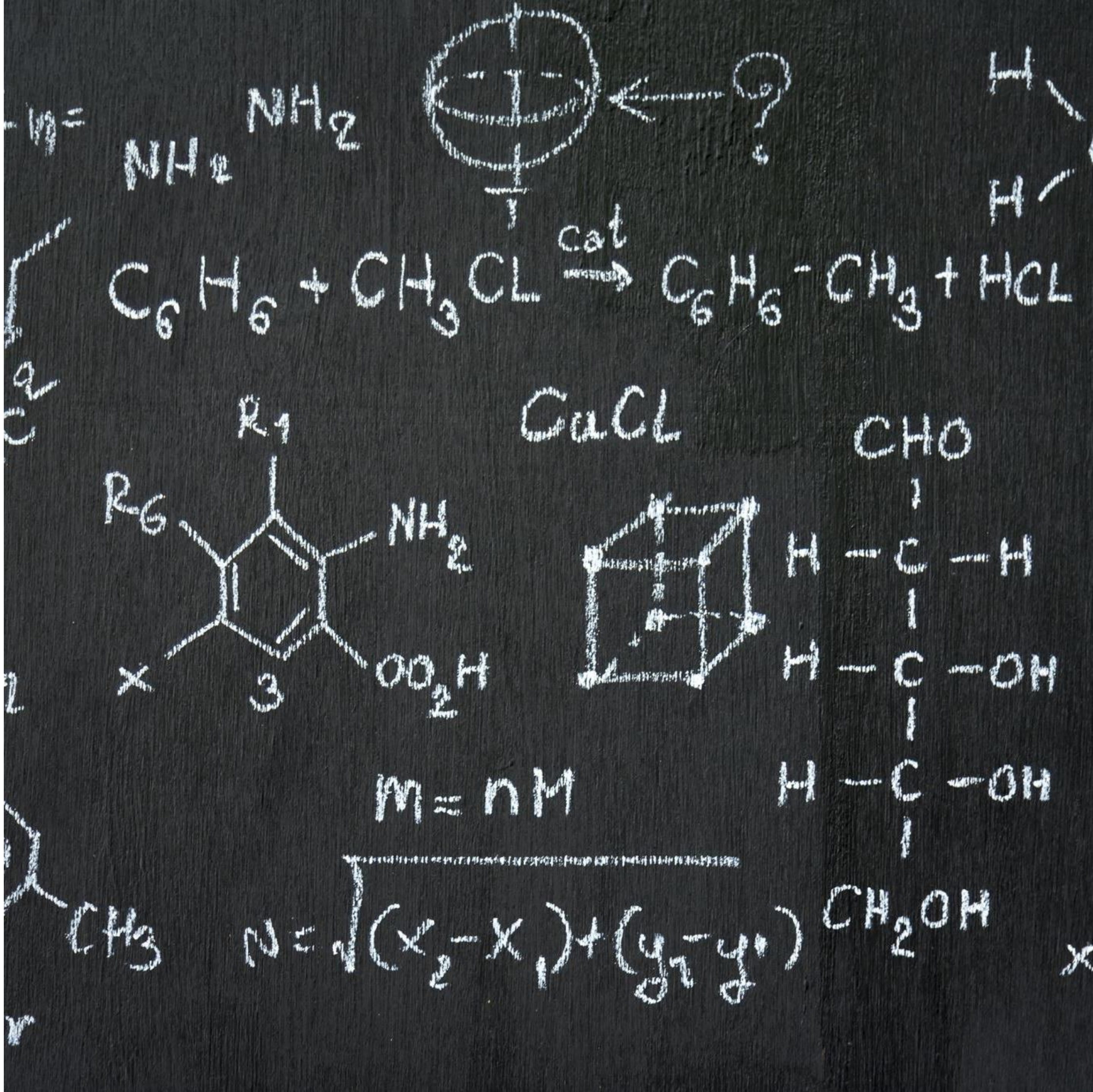


- **Initializing and turning on the hardware :**

```
      bmp280 bmp0; //Creates object bmp0;

char auth[] = "dypVBy43UaPq1dWugF65fynpUo1_iTSj";   //The AUTH token for the Blynk Device.
char ssid[] = "Uzumaki-Shisui";    // The Credentials for the Network connection
char pass[] = "mshashank6";

void setup(){
  Serial.begin(115200);  //Communication Bandwidth
  Serial.println("\nStart of the sensor"); //Serial Monitor Debugger
  Wire.begin();  //IC2 protocol initializes
  bmp0.begin(); //initializes BMP280 Object( Device)
  Blynk.begin(auth, ssid, pass); //The Device calling upon the Network Credentials
  //end of setup
}
```

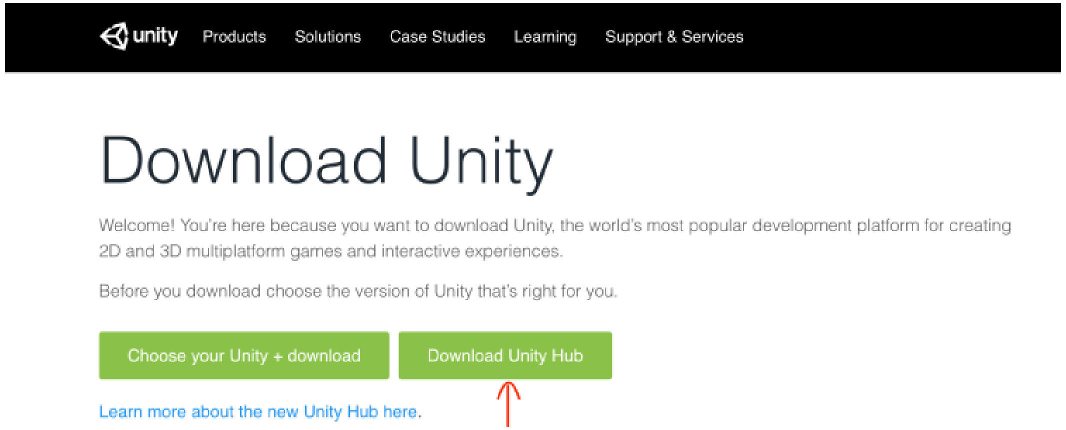
- **The Code to be run:**

```
   void loop(){
 double temp = bmp0.readTemperature();
 double press = bmp0.readPressure();
  Serial.print("Atmospheric  pressure = ");
 Serial.print(press, 4); //print pressure
with 4 decimal places
 Serial.println("  hPa.");
 Serial.print("Temperature  = ");
 Serial.print(temp,2);  //print with 2
decimal places
 Serial.println("  °C");
  Blynk.virtualWrite(V1, temp);
//Temperature
 Blynk.virtualWrite(V2, press); // Pressure

 delay(0);
 //end of loop
}
```



Prototype : 3D models using Unity AR

For AR, we used the Unity Hub software on our computer. Just Goto this link and download unity hub.

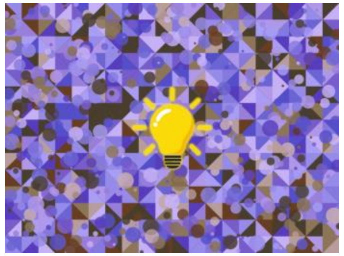


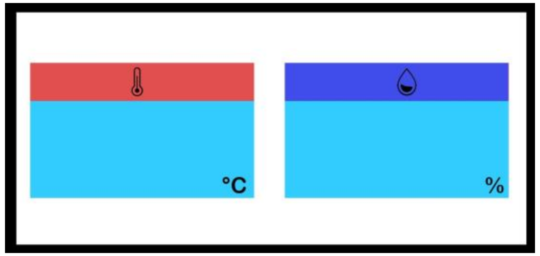
Download Unity

Welcome! You're here because you want to download Unity, the world's most popular development platform for creating 2D and 3D multiplatform games and interactive experiences.

Before you download choose the version of Unity that's right for you.

Learn more about the new Unity Hub here.





Setting up Unity

To Set up Unity, you'll need four things, one is the target image, second is Button Image, third is Template Image and fourth is C# Script for the button to display the data.

C# Script:

```
using System.Collections;
using UnityEngine;
using UnityEngine.UI;
using UnityEngine.Networking;
using Vuforia;

public class Click : MonoBehaviour
{
    InputField Temp;
    InputField Press;
    public Button yourButton;

    void Start()
    {
        Temp = GameObject.Find("InputFieldTemp").GetComponent<InputField>();

        Press = GameObject.Find("InputFieldPress").GetComponent<InputField>();

        Button btn = yourButton.GetComponent<Button>();
        btn.onClick.AddListener(TaskOnClick);
    }

    public void TaskOnClick()
    {
        GetData_Temp();
        GetData_Press();
        Debug.Log("Click");
    }
```

C# Script:

```
  void GetData_Temp() => StartCoroutine(GetData_Coroutine1());
  void GetData_Press() => StartCoroutine(GetData_Coroutine());

  IEnumerator GetData_Coroutine1()
  {
      Debug.Log("Getting Data");
      Temp.text = "Loading...";
      string uri = "//blr1.blynk.cloud/dypVBy43UaPq1dWugF65fynpUo1_iTSj/get/v1";
      using(UnityWebRequest request = UnityWebRequest.Get(uri))
      {
          yield return request.SendWebRequest();
          if (request.error != null)
              {
                  Temp.text = request.error;
              }
          else
          {

              Temp.text = request.downloadHandler.text;
              Temp.text = Temp.text.Substring(2,2);
          }
      }
  }
}
```

C# Script:

```
    IEnumerator GetData_Coroutine()
    {
        Debug.Log("Getting Data");
        Press.text = "Loading...";
        string uri = "//blr1.blynk.cloud/dypVBy43UaPq1dWugF65fynpUo1_iTSj/get/v2";
        using(UnityWebRequest request = UnityWebRequest.Get(uri))
        {
            yield return request.SendWebRequest();
            if (request.error != null)
                {
                    Press.text = request.error;
                }
            else
            {
                Press.text = request.downloadHandler.text;
                Press.text = Press.text.Substring(4,2);
            }
        }
    }
}
```

Click to add text

Thank You !