INTERNET OF THINGS - GROUP 5

PROJECT: PUBLIC TRANSPORT AUTOMATION

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PHASE 5: Declaration part – 2

PUBLIC TRANSPORT AUTOMATION:

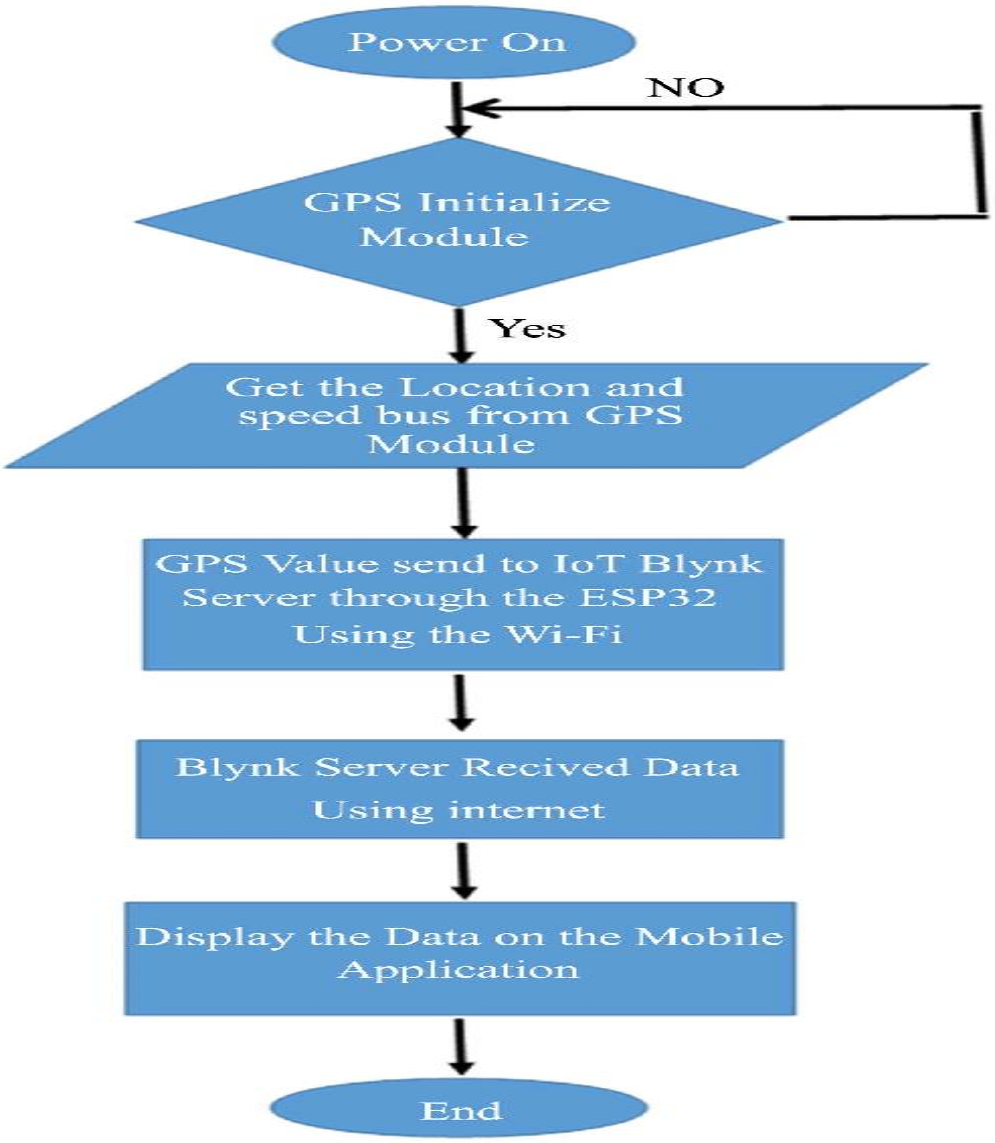
In this project, we will use Arduino boards and IoT devices to monitor and automate various aspects of public transport systems, such as buses, trams, or trains. The code will be written using the Arduino IDE to collect data, process it, and control different systems within the public transport infrastructure.

Components of water level monitoring:

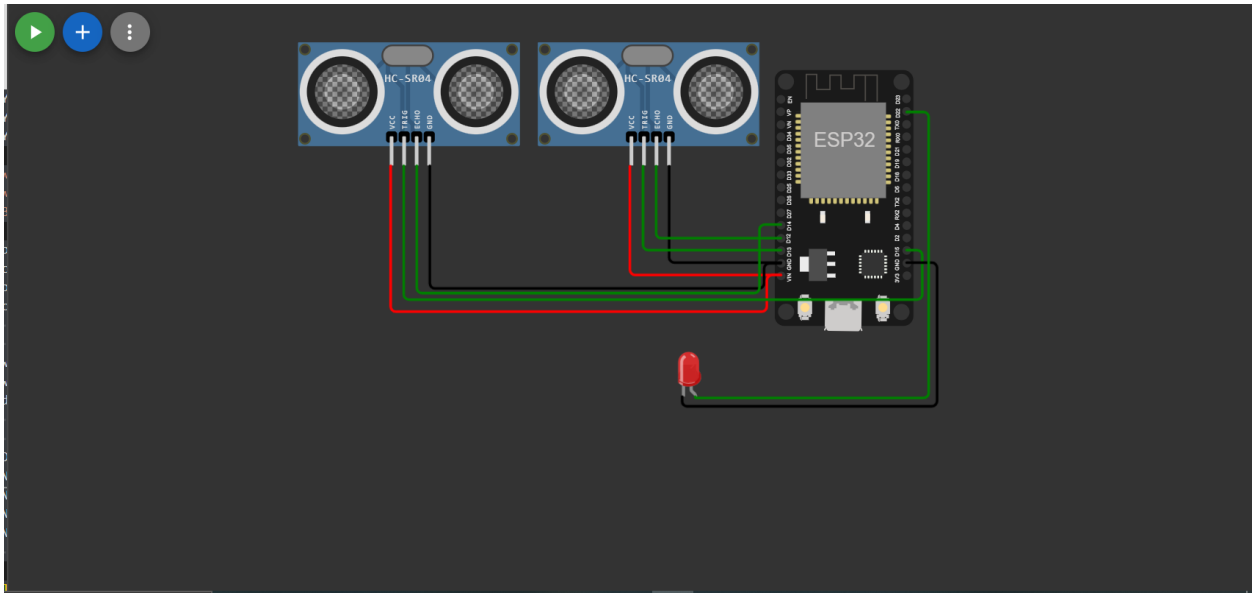
Some components are used to make the sensor work, to read the sensor data and displaying the process what doing now. The components are

1. ESP32 Development Board
2. Ultrasonic Distance Sensors
3. LEDs and Resistors (Optional)
4. Wi-Fi Network
5. Power Supply

Flow Chart:



Connection of Arduino Board using Wokwi:



Source code for the above Arduino board:

```
#define BLYNK_TEMPLATE_ID "TMPL26V4fGv5q"

#define BLYNK_TEMPLATE_NAME "Test"

#define BLYNK_AUTH_TOKEN "XEHxNF_Ur1Nt2p7wB5B20dNI1ZUwj34P"


#include <WiFi.h>

#include <WiFiClient.h>

#include <BlynkSimpleEsp32.h>


int duration1 = 0;

int distance1 = 0;

int duration2 = 0;

int distance2 = 0;

int dis1 = 0;

int dis2 = 0;

int dis_new1 = 0;
```

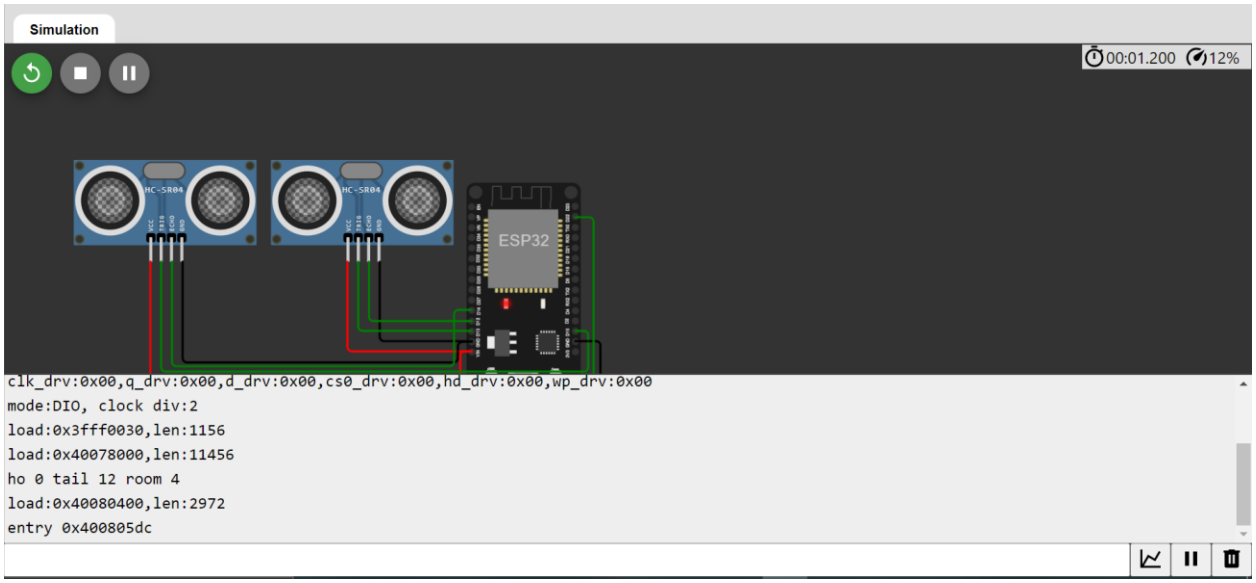
```
int dis_new2 = 0;
int entered = 0;
int left = 0;
int inside = 0;
#define LED 2
#define PIN_TRIG1 15
#define PIN_ECHO1 14
#define PIN_TRIG2 13
#define PIN_ECHO2 12
BlynkTimer timer;

char auth[] = BLYNK_AUTH_TOKEN;
char ssid[] = "Wokwi-GUEST";   // your network SSID (name)
char pass[] = "";
#define BLYNK_PRINT Serial

long get_distance1() {
  // Start a new measurement:
  digitalWrite(PIN_TRIG1, HIGH);
  delayMicroseconds(10);
  digitalWrite(PIN_TRIG1, LOW);

  // Read the result:
  duration1 = pulseIn(PIN_ECHO1, HIGH);
  distance1 = duration1 / 58;
```

```
  return distance1;
}

long get_distance2() {
  // Start a new measurement:
  digitalWrite(PIN_TRIG2, HIGH);
  delayMicroseconds(10);
  digitalWrite(PIN_TRIG2, LOW);

  // Read the result:
  duration2 = pulseIn(PIN_ECHO2, HIGH);
  distance2 = duration2 / 58;
  return distance2;
}

void myTimer() {
  Serial.println("100");
  dis_new1 = get_distance1();
  dis_new2 = get_distance2();
  if (dis1 != dis_new1 || dis2 != dis_new2){
    Serial.println("200");
    if (dis1 < dis2){
      Serial.println("Enter loop");
      entered = entered + 1;
      inside = inside + 1;
```

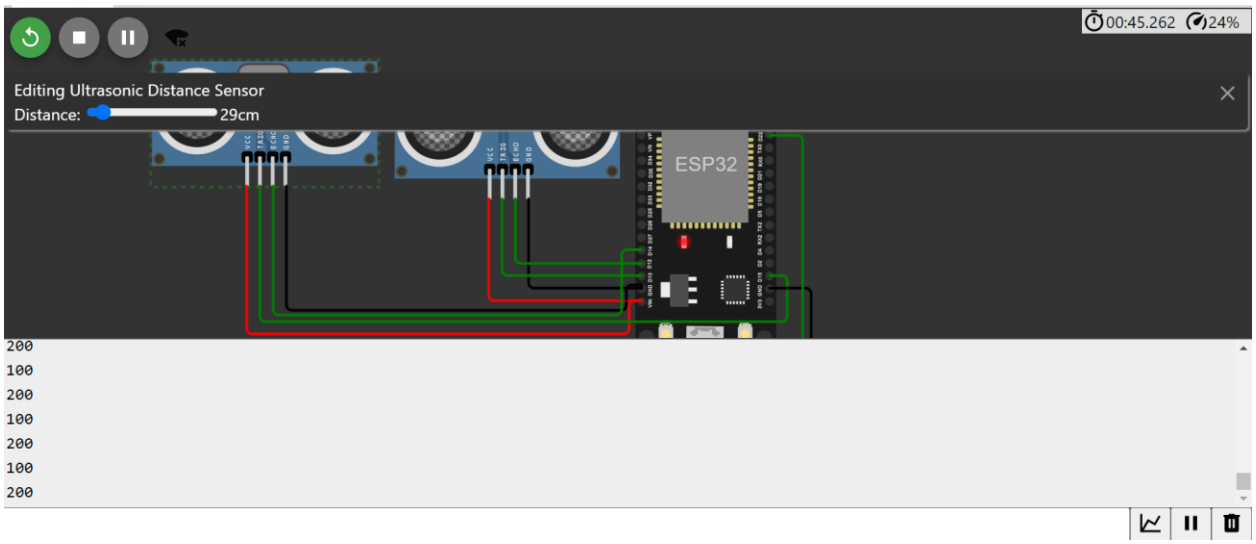
```
    digitalWrite(LED, HIGH);
    Blynk.virtualWrite(V0, entered);
    Blynk.virtualWrite(V2, inside);
    dis1 = dis_new1;
    delay(1000);
    digitalWrite(LED, LOW);
   }
   if (dis1 > dis2){
    Serial.println("Leave loop");
    left = left + 1;
    inside = inside - 1;
    Blynk.virtualWrite(V1, left);
    Blynk.virtualWrite(V2, inside);
    dis2 = dis_new2;
    delay(1000);
   }

  }


}

 void setup() {
  Serial.begin(115200);
  pinMode(LED, OUTPUT);
```

```
 pinMode(PIN_TRIG1, OUTPUT);

 pinMode(PIN_ECHO1, INPUT);

 pinMode(PIN_TRIG2, OUTPUT);

 pinMode(PIN_ECHO2, INPUT);

 Blynk.begin(auth, ssid, pass, "blynk.cloud", 8080);

 timer.setInterval(1000L, myTimer);


}


void loop() {

 Blynk.run();

 timer.run();

}
```

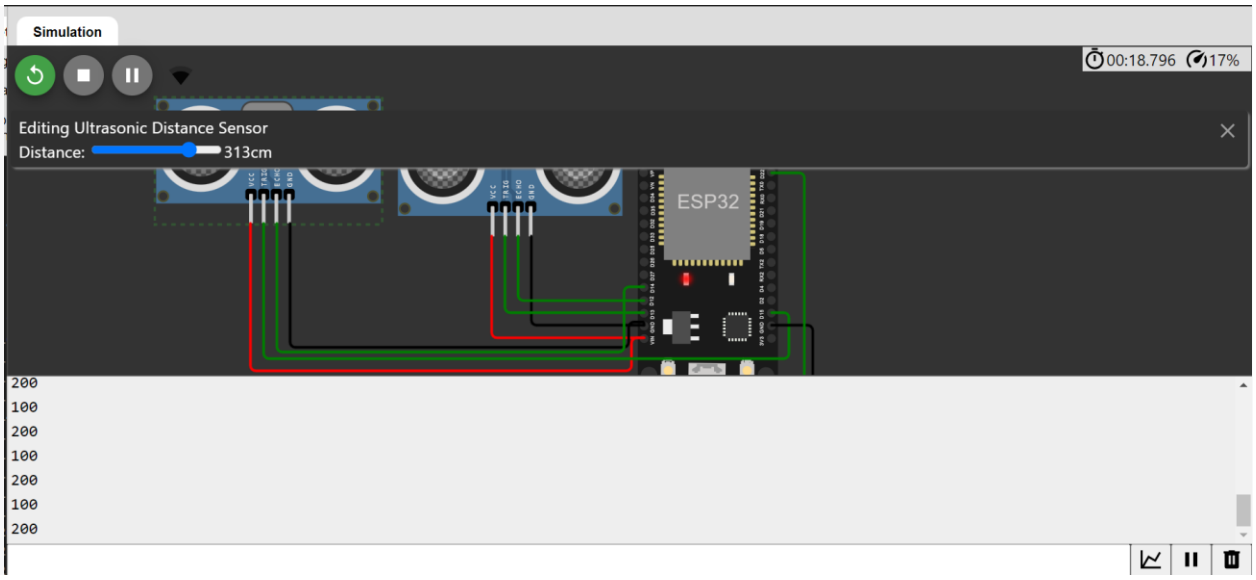
Output:



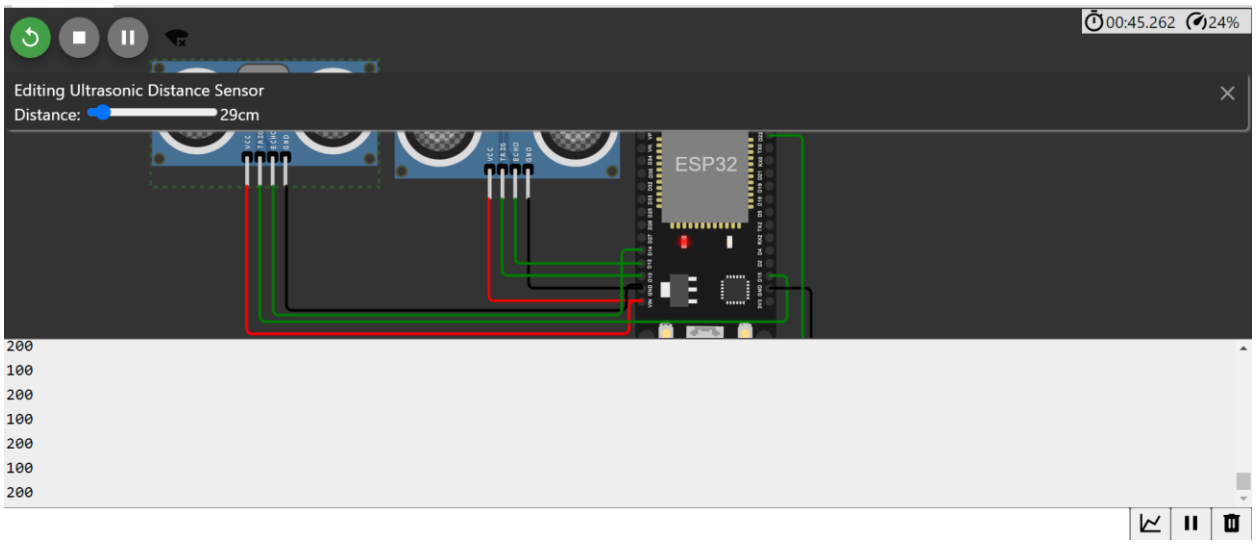
These output definitions specify the pins used for the TRIG and ECHO pins of the first ultrasonic distance sensor (HC-SR04). The TRIG pin triggers the sensor, and the ECHO pin receives the reflected signal.



These output definitions specify the pins used for the TRIG and ECHO pins of the second ultrasonic distance sensor (HC-SR04). Like the first sensor, the TRIG pin triggers the sensor, and the ECHO pin receives the reflected signal.



These output definitions are crucial for specifying the pins used to control and read data from the components connected to the ESP32.



CONCLUSION:

In this phase, we'll develop a virtual public transport automation system using Wokwi to simulate vehicle tracking and route optimization. Instead of water level monitoring, we'll focus on tracking and optimizing the routes of public transport vehicles, such as buses or trams, for efficient and safe operations.