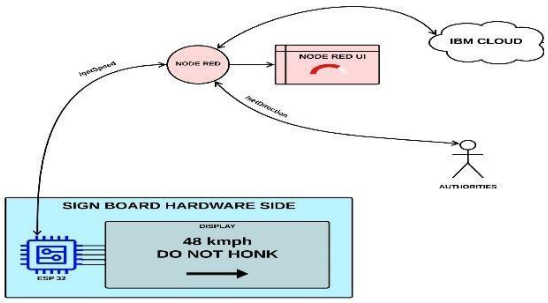
Sprint 4

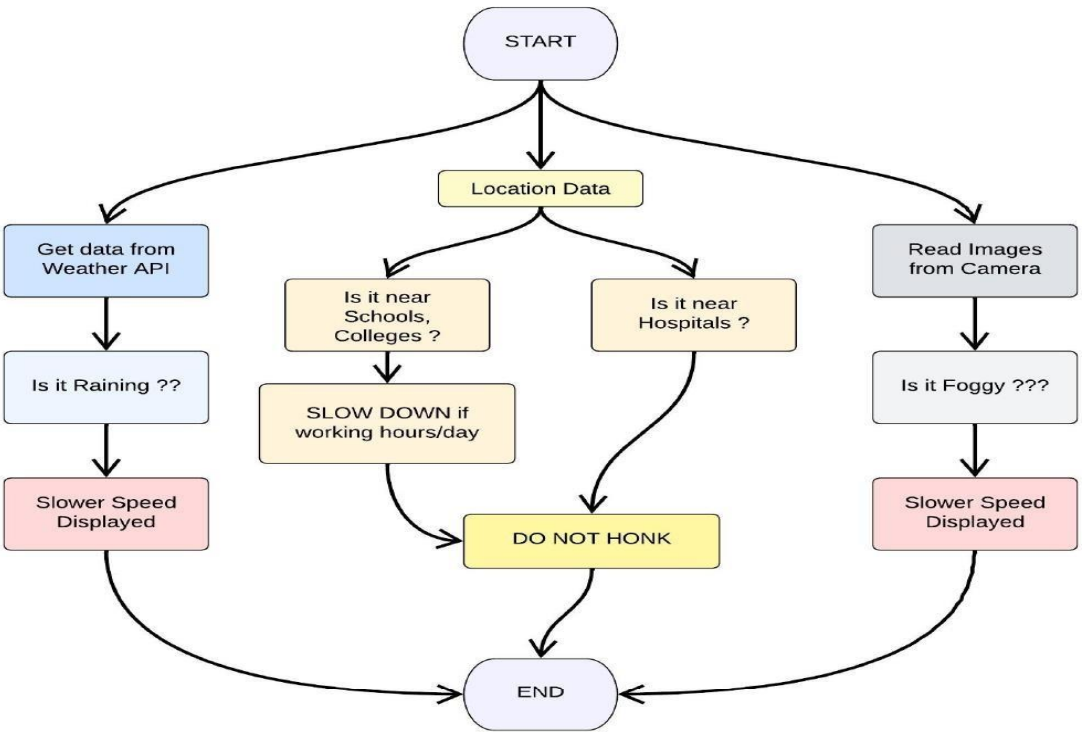
Signs with Smart Connectivity for Better Road Safety

Team ID : PNT2022TMID52316

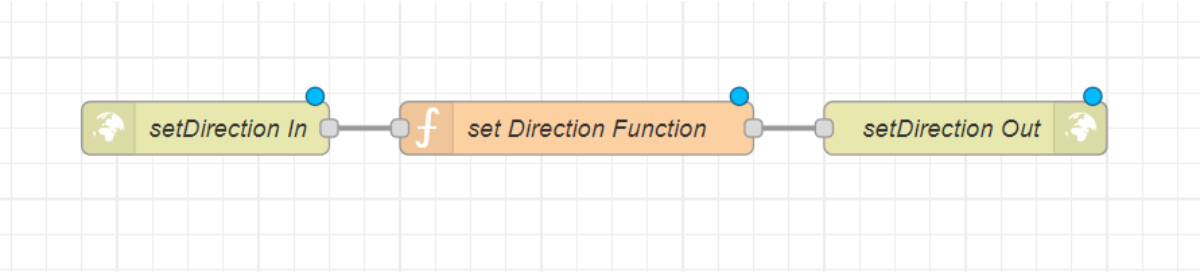
Process flow



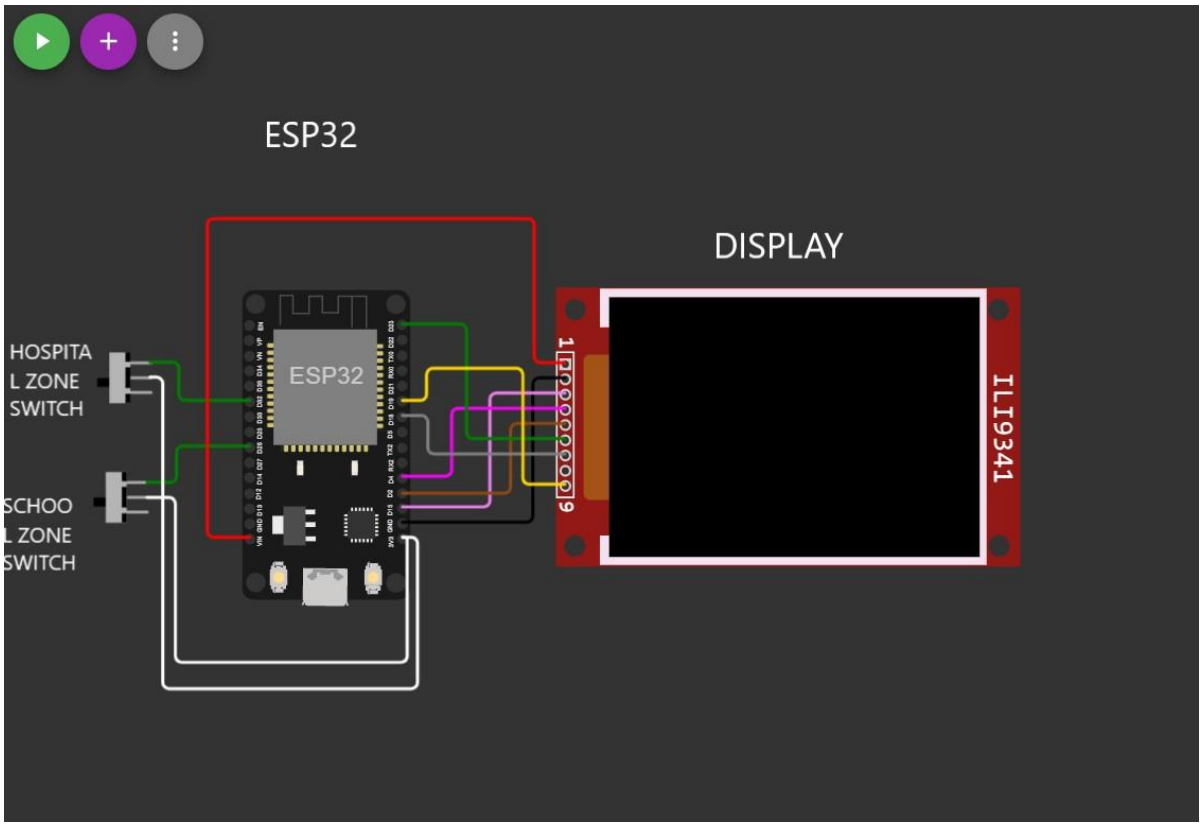
Code flow



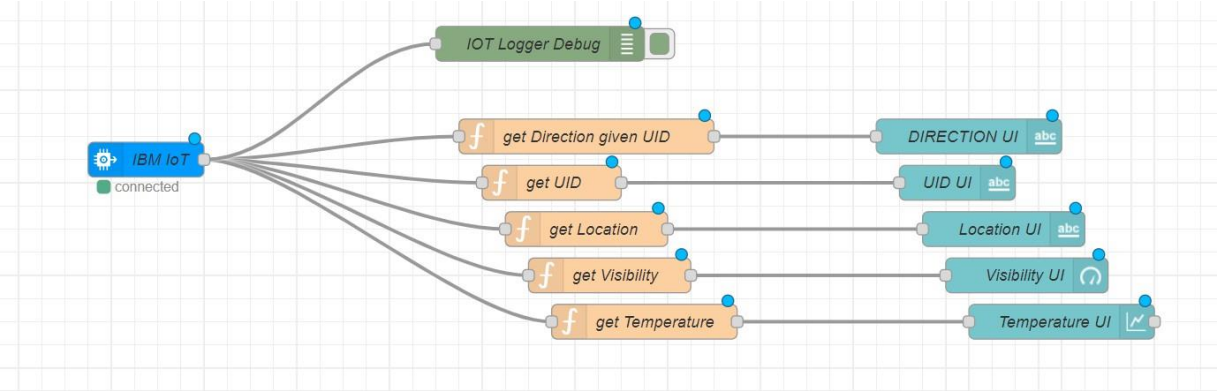
Direction flow



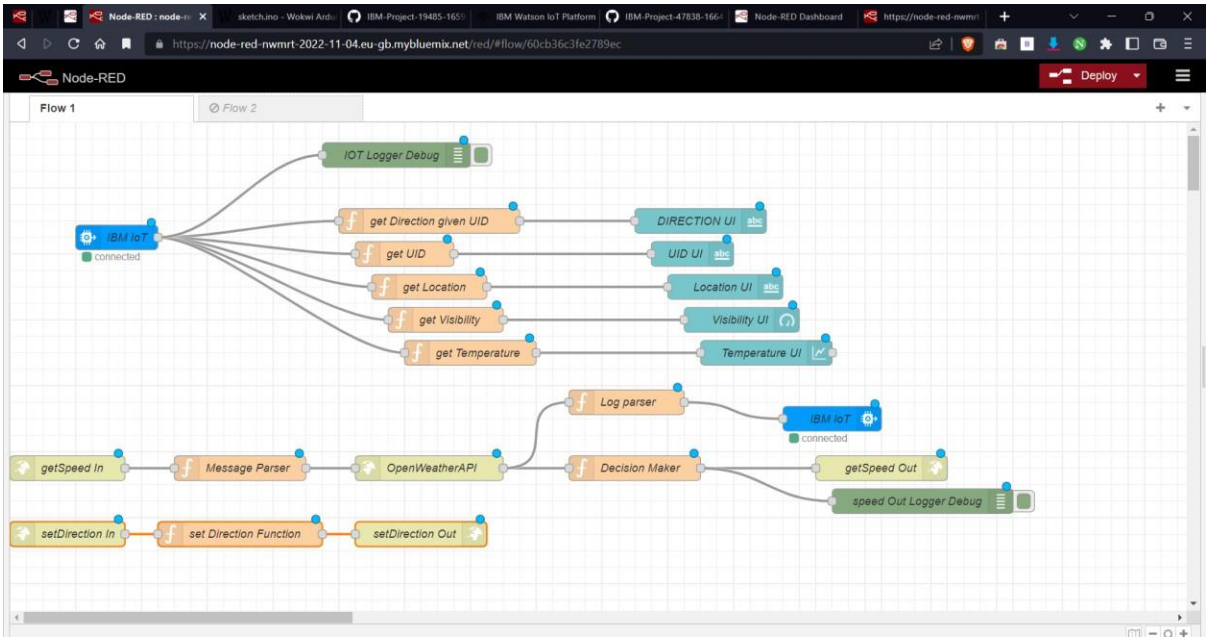
Esp32 circuit diagram



IOT flow Diagram



Overall Node-Red flow



Code

```
#include
<WiFi.h>
          #include <HTTPClient.h>
          #include <Adafruit_GFX.h>
          #include <Adafruit_ILI9341.h>
          #include <string.h>
```

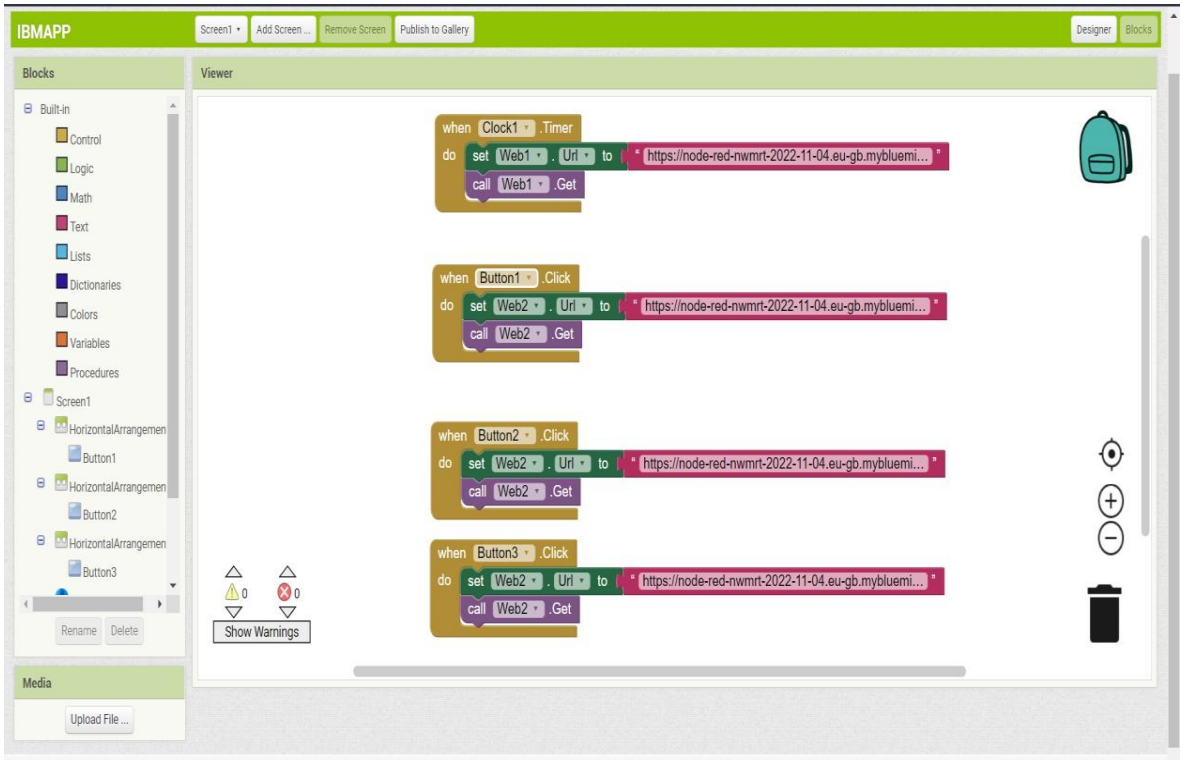
```
const char* ssid = "Wokwi-GUEST";
const char* password = "";


#define TFT_DC 2
#define TFT_CS 15
Adafruit_ILI9341 tft = Adafruit_ILI9341(TFT_CS, TFT_DC);


String myLocation = "Chennai,IN";
String usualSpeedLimit = "70"; // kmph


int schoolZone = 32;
int hospitalZone = 26;


int uid = 2504;


String getString(char x)
{
    String s(1, x);
    return s;
}


String stringSplitter1(String fullString,char delimiter='$')
{
    String returnString = "";
    for(int i = 0; i<fullString.length();i++) {
        char c = fullString[i];
        if(delimiter==c)
            break;
        returnString+=String(c);
    }
    return(returnString);
}


String stringSplitter2(String fullString,char delimiter='$')
{
    String returnString = "";
    bool flag = false;
    for(int i = 0; i<fullString.length();i++) {
        char c = fullString[i];
        if(flag)
            returnString+=String(c);
        if(delimiter==c)
```

```
            flag = true;
    }
    return(returnString);
}


void rightArrow()
{
  int refX = 50;
  int refY = tft.getCursorY() + 40;


  tft.fillRect(refX,refY,100,20,ILI9341_RED);
  tft.fillTriangle(refX+100,refY-
30,refX+100,refY+50,refX+40+100,refY+10,ILI9341_RED);
}


void leftArrow()
{
  int refX = 50;
  int refY = tft.getCursorY() + 40;


  tft.fillRect(refX+40,refY,100,20,ILI9341_RED);
  tft.fillTriangle(refX+40,refY-30,refX+40,refY+50,refX,refY+10,ILI9341_RED);
}


void upArrow()
{
  int refX = 125;
  int refY = tft.getCursorY() + 30;


  tft.fillTriangle(refX-40,refY+40,refX+40,refY+40,refX,refY,ILI9341_RED);
  tft.fillRect(refX-15,refY+40,30,20,ILI9341_RED);
}


String APICall() {
  HTTPClient http;


  String url = "https://node-red-nwmrt-2022-11-04.eu-
gb.mybluemix.net/getSpeed?";
  url += "location="+myLocation+"&";
  url += "schoolZone="+(String)digitalRead(schoolZone)+(String)"&";
  url += "hospitalZone="+(String)digitalRead(hospitalZone)+(String)"&";
  url += "usualSpeedLimit="+(String)usualSpeedLimit+(String)"&";
  url += "uid="+(String)uid;
```

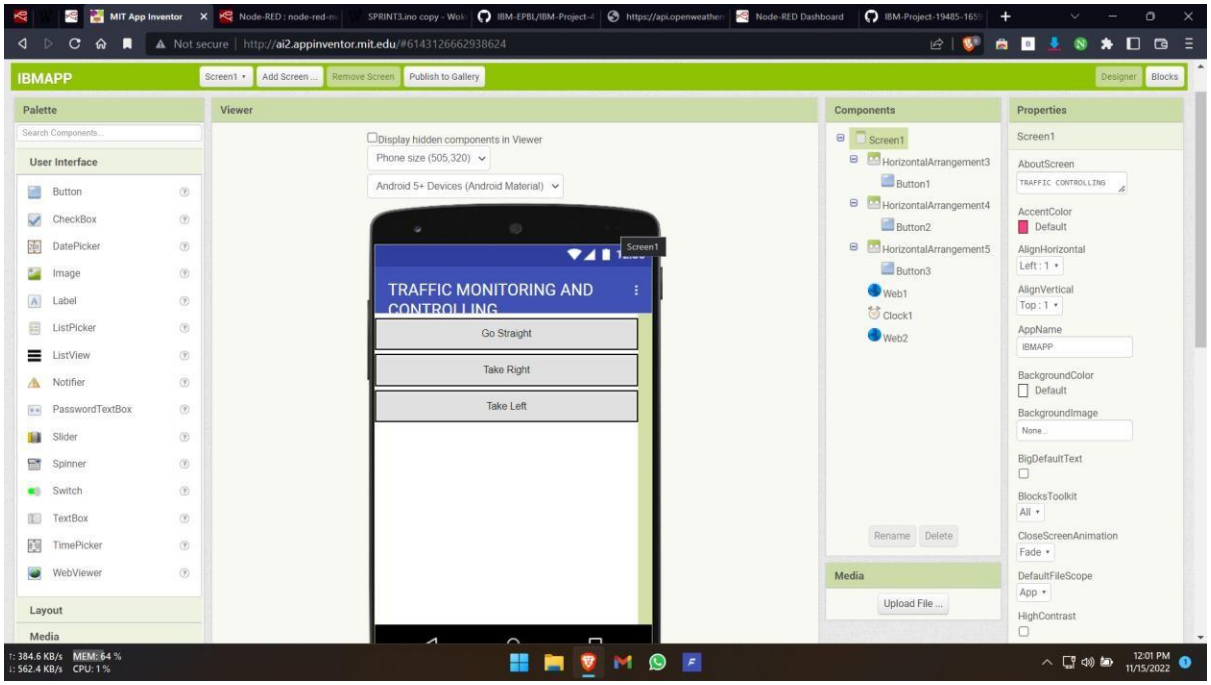
```
  http.begin(url.c_str());
  int httpResponseCode = http.GET();

  if (httpResponseCode>0) {
    String payload = http.getString();
    http.end();
    return(payload);
  }
  else {
    Serial.print("Error code: ");
    Serial.println(httpResponseCode);
  }
  http.end();
}


void myPrint(String contents) {
  tft.fillScreen(ILI9341_BLACK);
  tft.setCursor(0, 20);
  tft.setTextSize(4);
  tft.setTextColor(ILI9341_RED);
  //tft.println(contents);


  tft.println(stringSplitter1(contents));
  String c2 = stringSplitter2(contents);
  if(c2=="s") // represents Straight
  {
    upArrow();
  }
  if(c2=="l") // represents left
  {
    leftArrow();
  }
  if(c2=="r") // represents right
  {
    rightArrow();
  }
}


void setup() {
  WiFi.begin(ssid, password, 6);


  tft.begin();
  tft.setRotation(1);


  tft.setTextColor(ILI9341_WHITE);
  tft.setTextSize(2);
```

```
  tft.print("Connecting to WiFi");


  while (WiFi.status() != WL_CONNECTED) {
    delay(100);
    tft.print(".");
  }


  tft.print("\nOK! IP=");
  tft.println(WiFi.localIP());
}


void loop() {


  myPrint(APICall());


  delay(100);
}
```

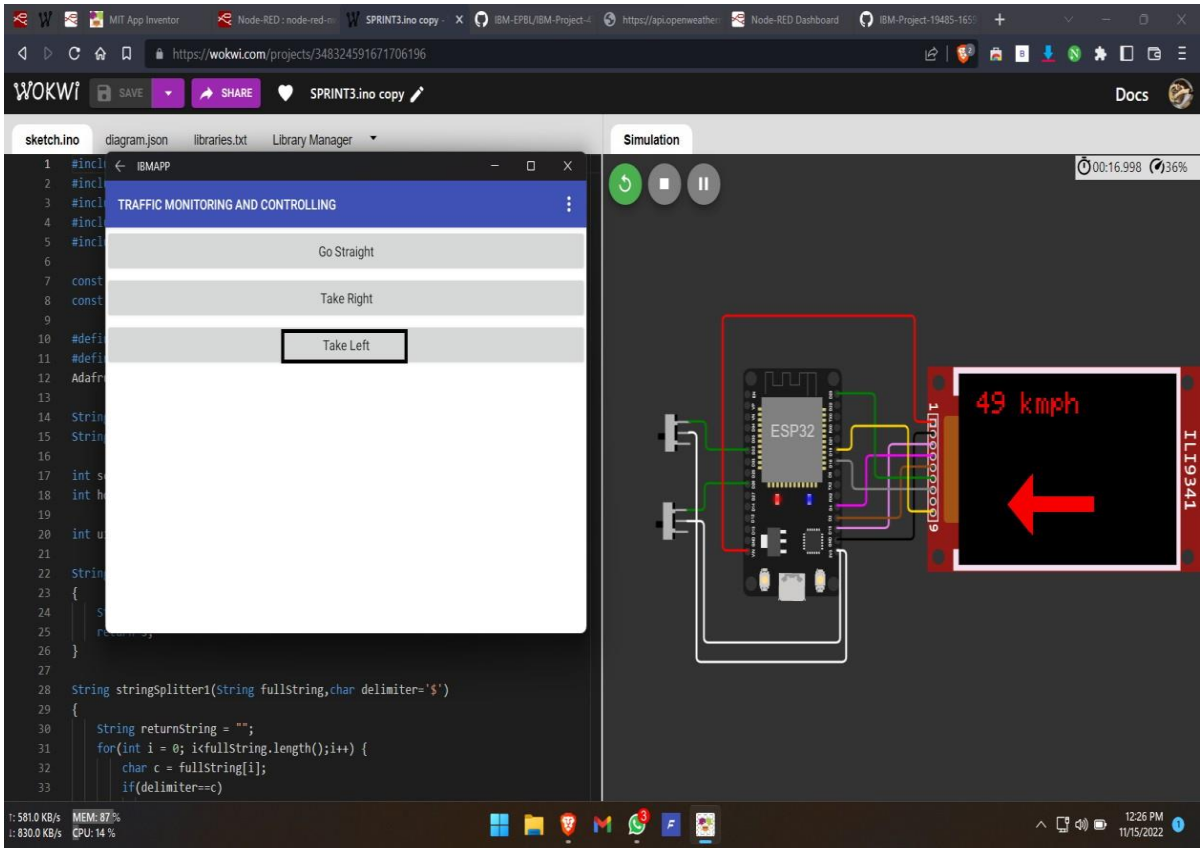
MIT app block code for managing traffic



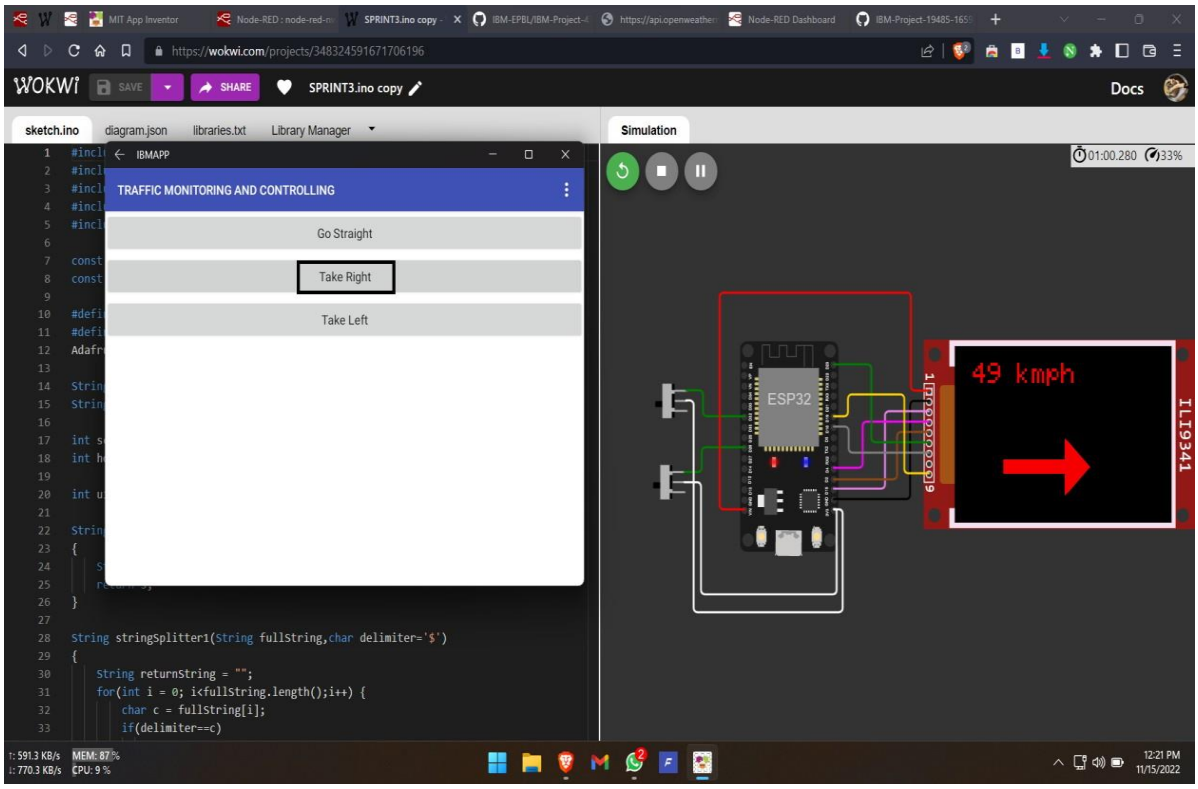
MIT app UI for authortity



Authority giving take left direction



Authority giving take right direction



Authority giving take right direction