SPRINT 4

TOPIC : SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY.

TEAM ID : PNT2022 TMID06138

DATE : 19 NOV 2022

SOFTWARE USED:

- Wokwi Online Simulator
- IBM Watson IOT
- Node-Red
- MIT App Inventor

US 1: Creating a simulation of a digital board using Wokwi Online Simulator and controlling the Diversions using Node-Red

CODE:

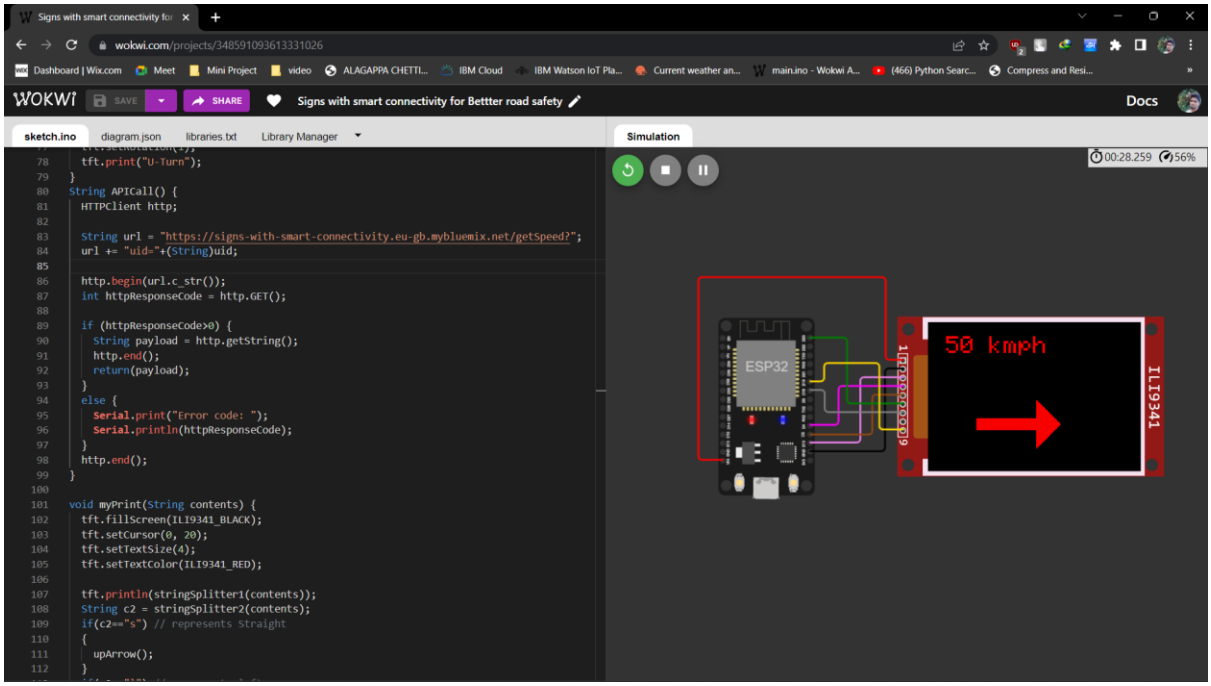
```
#include <WiFi.h>
#include <HTTPClient.h>
#include <Adafruit_GFX.h>
#include <Adafruit_ILI9341.h>
#include <string.h>

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);

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;
```

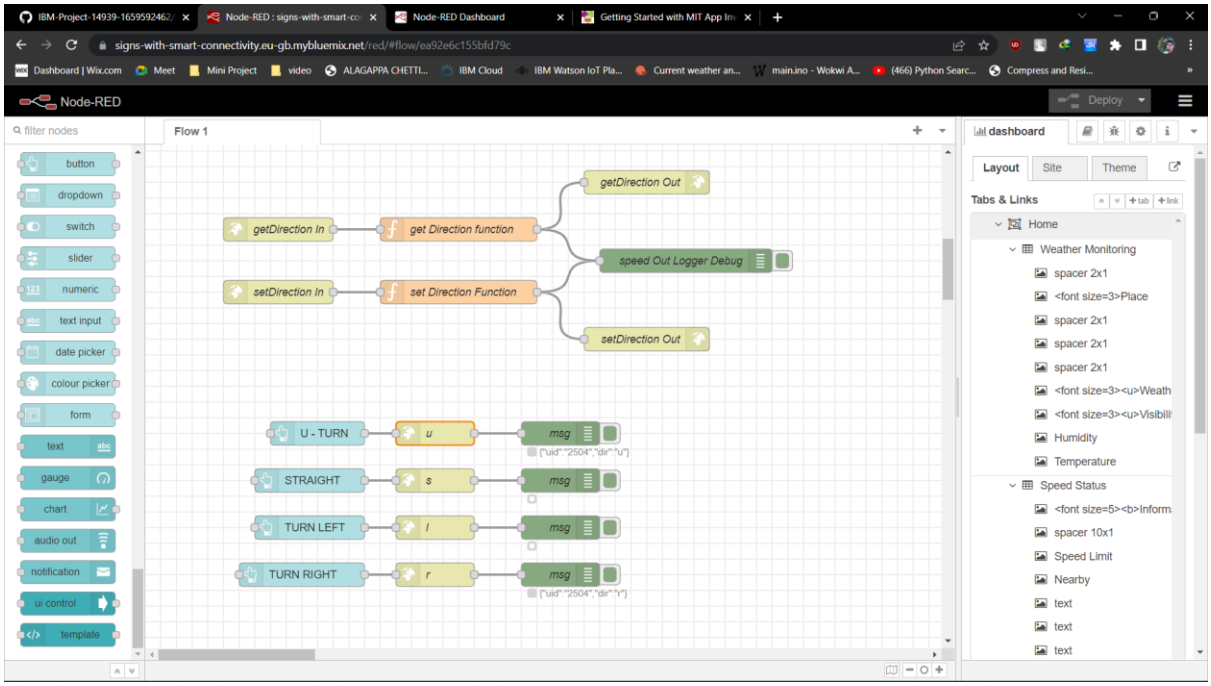
```
  tft.fillTriangle(refX-40,refY+40,refX+40,refY+40,refX,refY,ILI9341_RED);
  tft.fillRect(refX-15,refY+40,30,20,ILI9341_RED);
}
void uTurn(){
  tft.setTextSize(7);
  tft.setTextColor(ILI9341_RED);
  tft.setRotation(1);
  tft.print("U-Turn");
}
String APICall() {
  HTTPClient http;

  String url = "https://signs-with-smart-connectivity.eu-
gb.mybluemix.net/getDirection?";
  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(stringSplitter1(contents));
  String c2 = stringSplitter2(contents);
  if(c2=="s") // represents Straight
  {
    upArrow();
  }
  if(c2=="l") // represents left
  {
    leftArrow();
  }
```

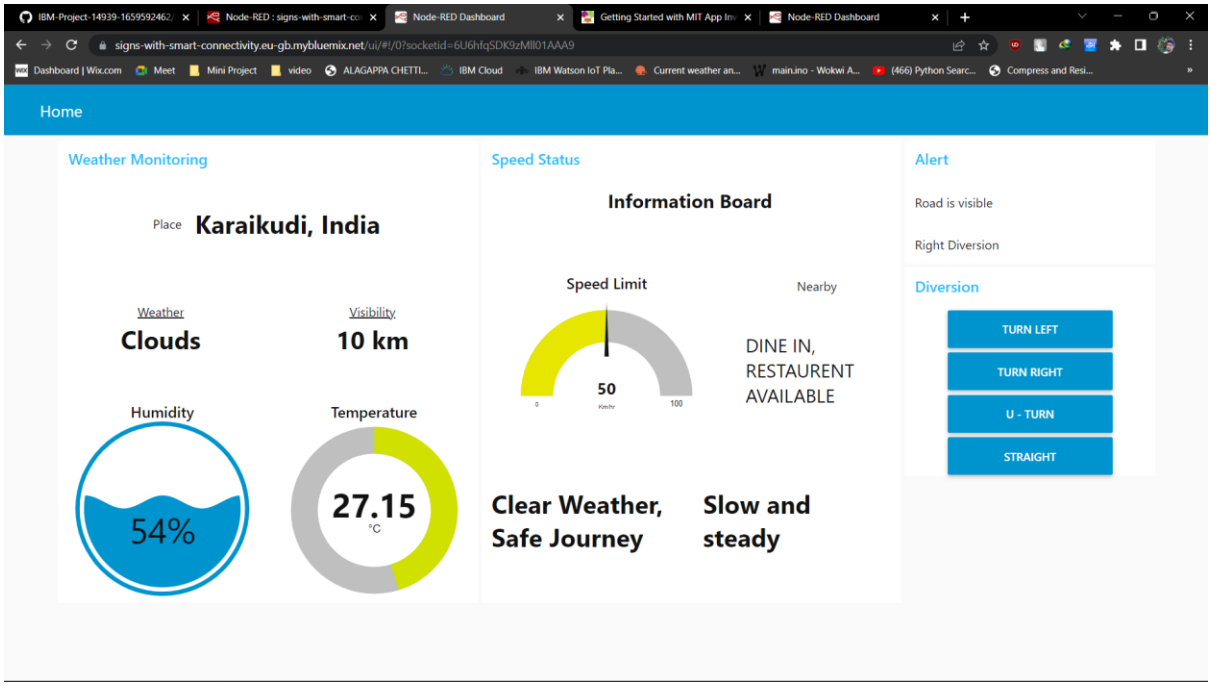
```
  if(c2=="r") // represents right
  {
    rightArrow();
  }
   if(c2=="u") // represents U TURN
  {
    uTurn();
  }
}

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());
}
```

OUTPUT:



US 2: Controls in Node-Red for Diversions





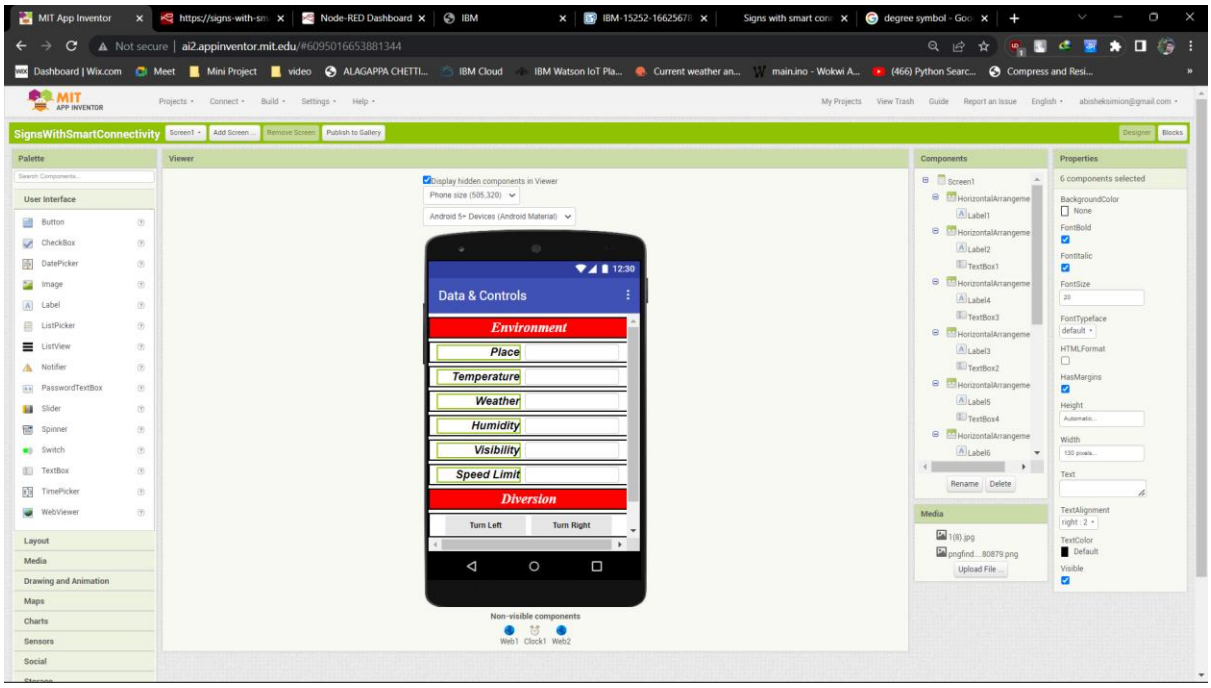
NODE-RED LINK:

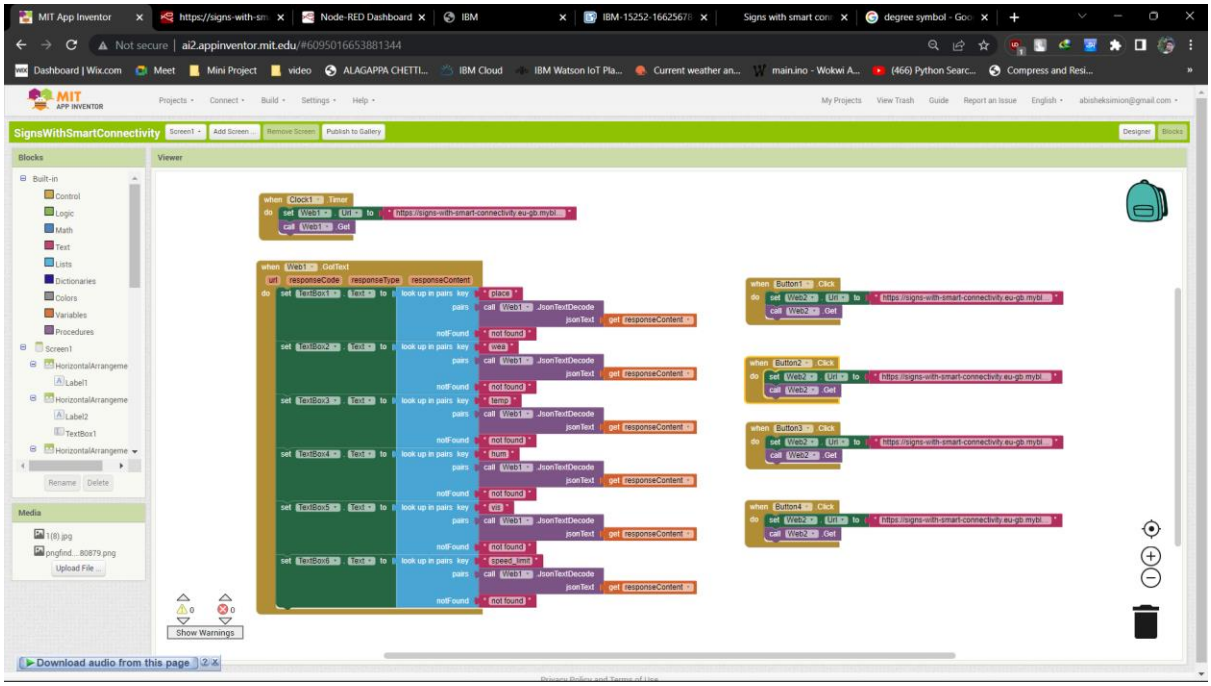
https://signs-with-smart-connectivity.eu-gb.mybluemix.net/ui

SIMULATION LINK:

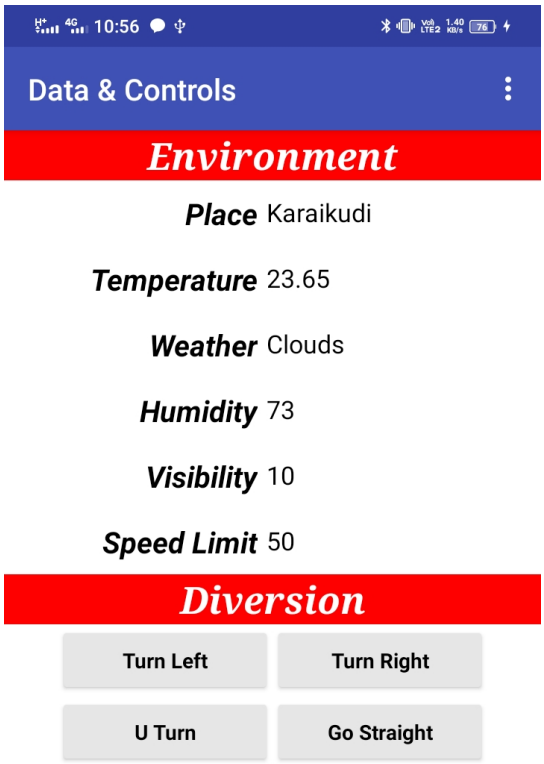
https://wokwi.com/projects/348591093613331026

US 3: Created an App to get Weather data and to change diversion in Sign boards in MIT App Inventor.






10:56
Data & Controls
Environment
Place Place
Temperature °C
Weather Condition
Humidity %
Visibility km
Speed Limit km/hr
Diversion
Turn Left
Turn Right
U Turn
Go Straight


10:56
Data & Controls
Environment
Place Karaikudi
Temperature 23.65
Weather Clouds
Humidity 73
Visibility 10
Speed Limit 50
Diversion
Turn Left
Turn Right
U Turn
Go Straight