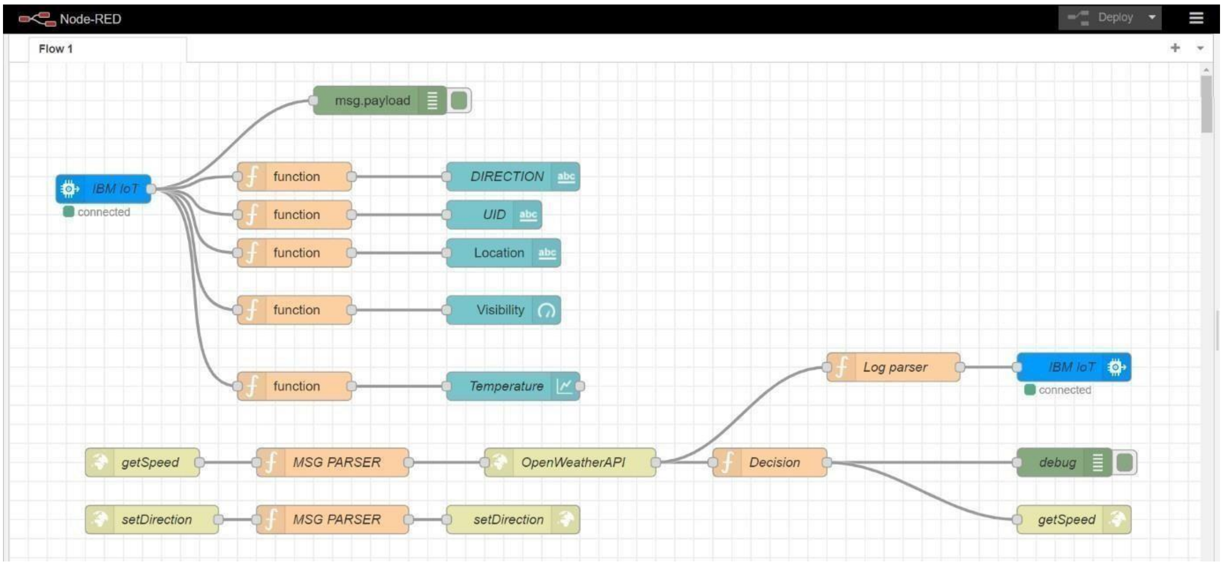
Sprint 04

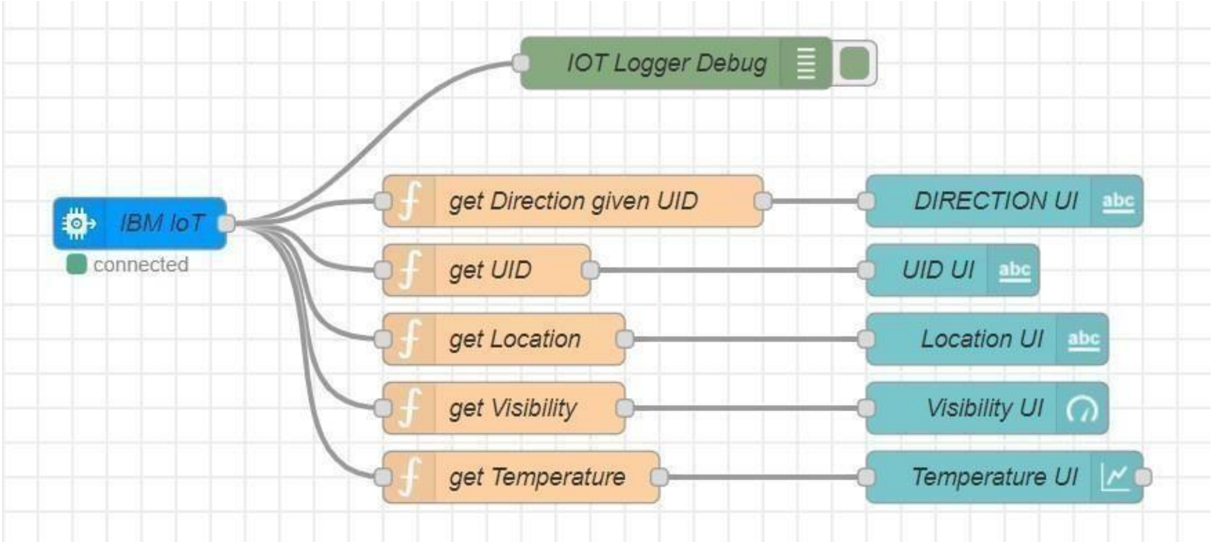
Signs with Smart Connectivity for Better Road Safety

Team ID	PNT2022TMID11468
Project Name	Signs with smart connectivity for Better road safety

Node RED :

Node RED flow :

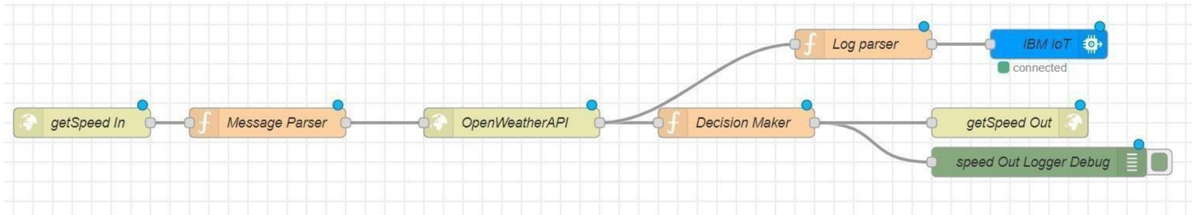




// get Direction given UID msg.payload =
global.get(String(msg.payload.uid));

```
return msg;
// get UID msg.payload = msg.payload.uid;
return msg;
//        get       Location
msg.payload  = msg.payload.location;
return msg;
//        get       Visibility
msg.payload  = msg.payload.visibility;
return msg;
//        get       Temperature
msg.payload  = msg.payload.temperature;
 return msg;
```

getSpeed API flow :



```
weatherObj = JSON.parse(JSON.stringify(msg.payload));
localityObj= global.get("data");
var suggestedSpeedPercentage = 100;
var preciseObject =  {          temperature
          : weatherObj.main.temp - 273.15, location
: localityObj.location, visibility          :
weatherObj.visibility/100,     uid       :
       localityObj.uid,
       direction : global.get("direction") };

msg.payload = preciseObject;

        return msg;

       weatherObj=JSON.parse(JSON.stringify

(msg.payload)); localityObj

          =          global.get("data");
var suggestedSpeedPercentage = 100;
var
          preciseObject =          {          temperature
          : weatherObj.main.temp - 273.15,
       weather : weatherObj.weather.map(x=>x.id).filter(code => code<700),
visibility : weatherObj.visibility/100 };
```

```
 if(preciseObject.visibility<=40) suggestedSpeedPercentage -=30

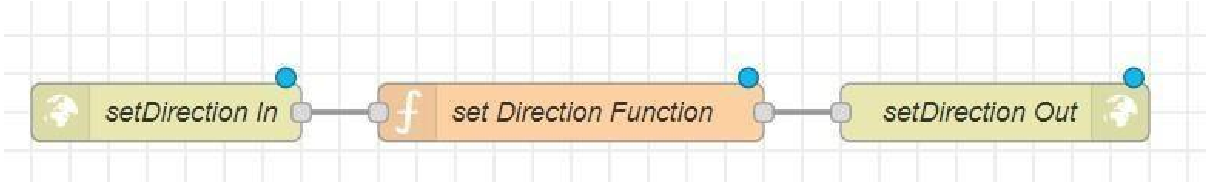
switch(String(preciseObject.weather)[-1])     //     https://openweathermap.org/weather-
 conditions refer weather codes meaning here
 { case "0" : suggestedSpeedPercentage -=10;break; case "1" :
       suggestedSpeedPercentage -=20;break; case "2"
       :
       suggestedSpeedPercentage -=30;break; }

 msg.payload = preciseObject;

 var doNotHonk = 0;
 if(localityObj.hospitalZone=="1"||localityObj.schoolZone=="1") doNotHonk
       = 1;

 var          returnObject          =          {          suggestedSpeed
       :  localityObj.usualSpeedLimit*(suggestedSpeedPercentage/100),  doNotHonk  :
       doNotHonk
 }
msg.payload    =   String(returnObject.suggestedSpeed)    +    "    kmph    \n\n"    +
 (returnObject.doNotHonk==1?"Do Not Honk":"") + "$" + global.get(String(localityObj.uid));

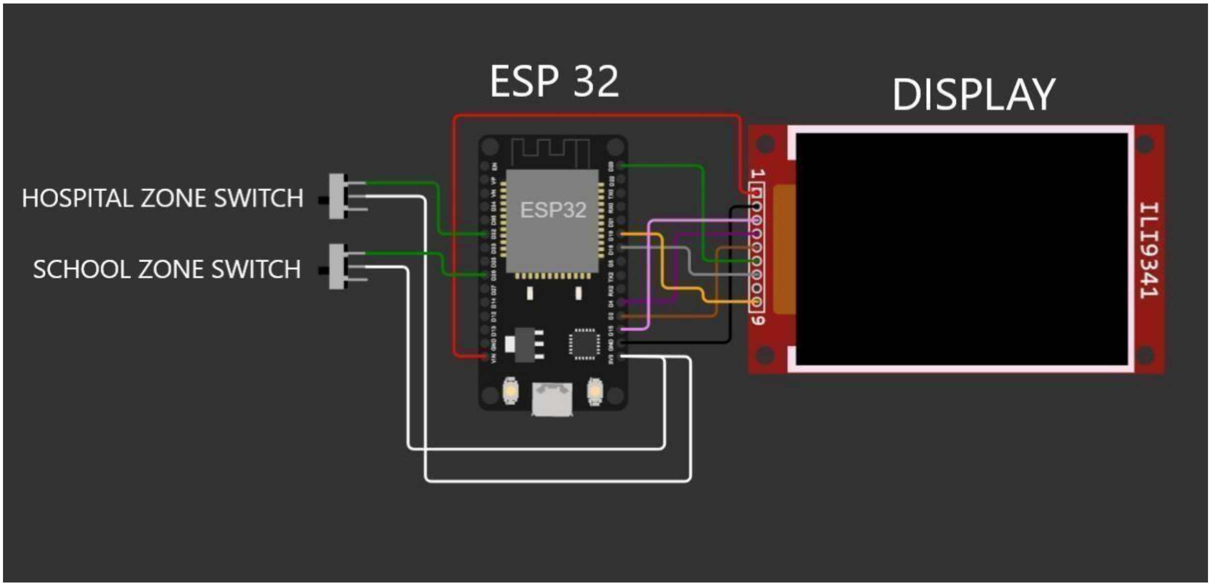
 return msg;
```



```
global.set(String(msg.payload.uid),msg.payload.dir);

 return msg;
```

Circuit Diagram :



ESP 32 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; // ID Unique to this Micro Contoller 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-grseb-2022-11-05-test.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(".");
  }

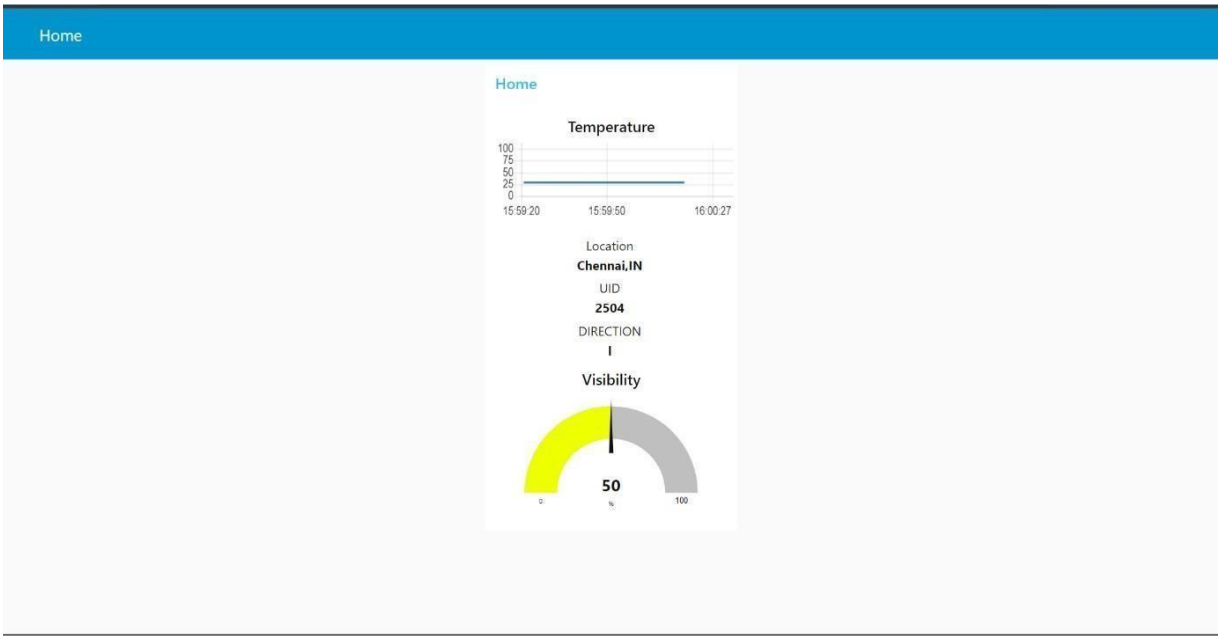
  tft.print("\nOK! IP="); tft.println(WiFi.localIP());
}

void loop() { myPrint(APICall());
```

```
delay(100);}
```

Output :

Node RED Dashboard :



Temperature

Location

Chennai,IN

UID

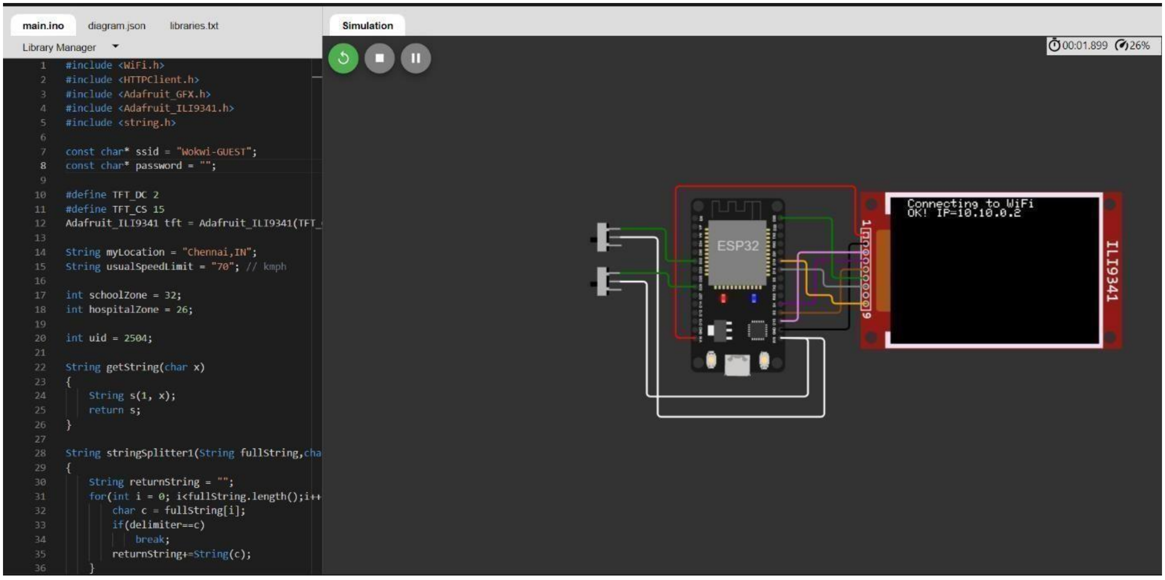
2504

DIRECTION

I

Visibility

Wokwi Output :



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#include <Adafruit_GFX.h>
#include <Adafruit_ILI9341.h>
#include <string.h>

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Adafruit_ILI9341 tft = Adafruit_ILI9341(TFT_

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

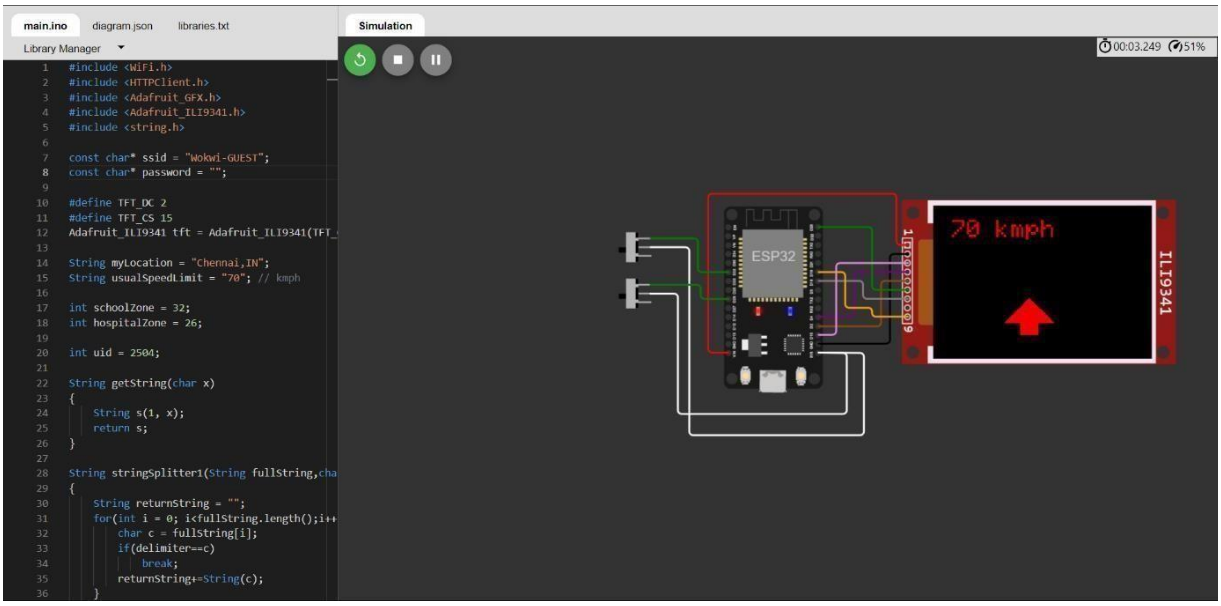
int schoolZone = 32;
int hospitalZone = 26;

int uid = 2504;

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

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

```
Connecting to WiFi
OK! IP=10.10.0.2
```



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String myLocation = "Chennai,IN";
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int uid = 2504;

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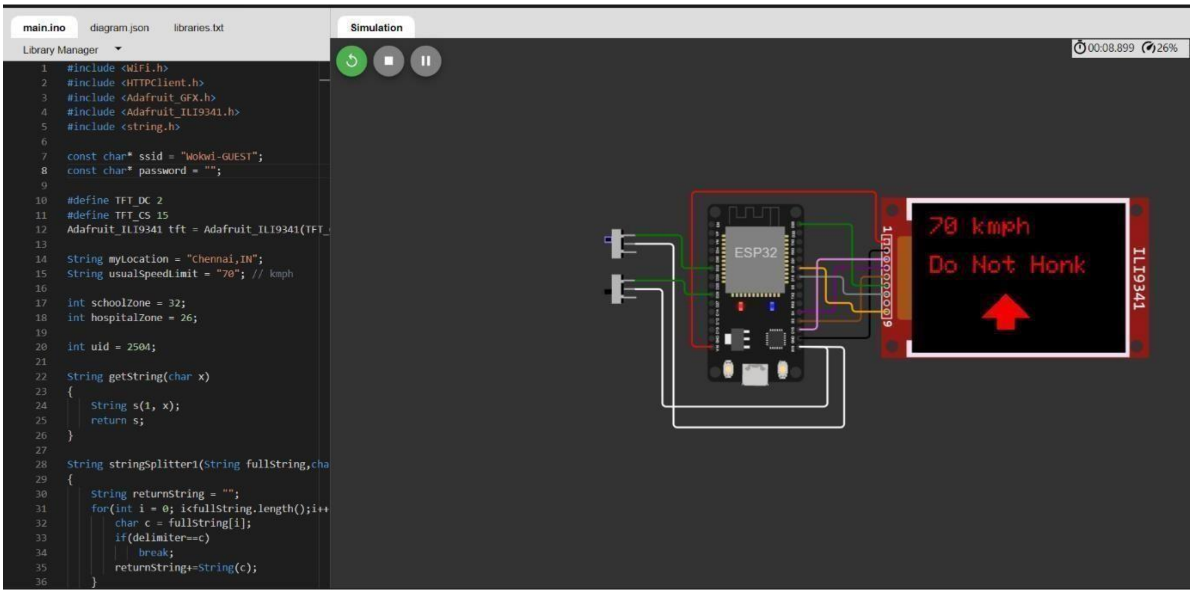
        if(delimiter==c)
            break;
        returnString+=String(c);
    }
```



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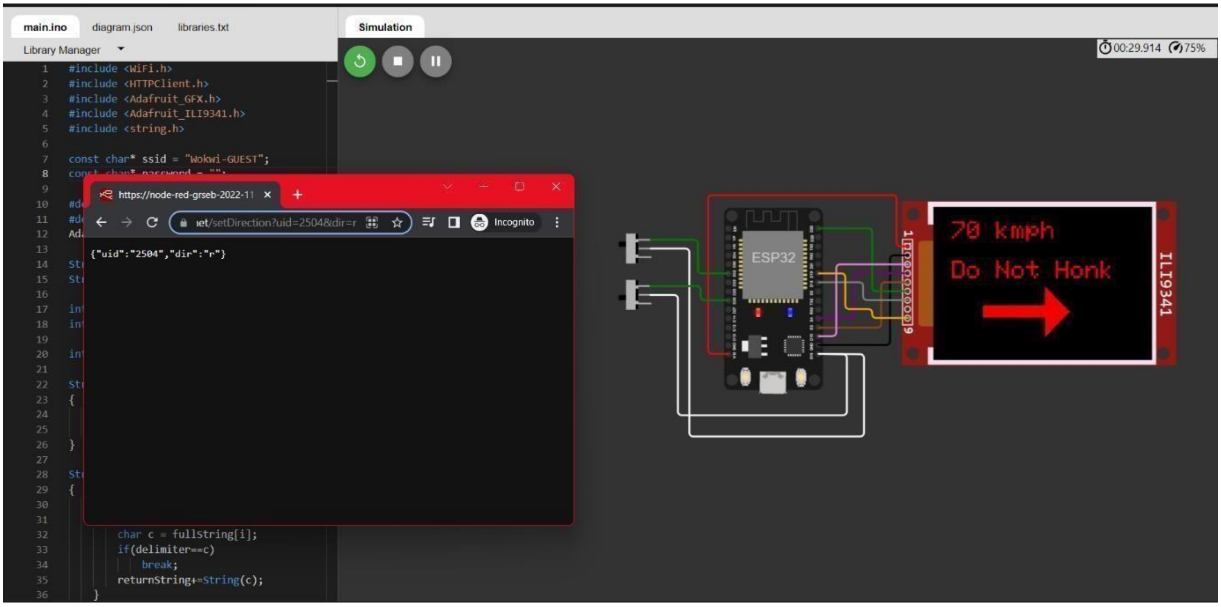
        if(delimiter==c)
            break;
        returnString+=String(c);
    }
```



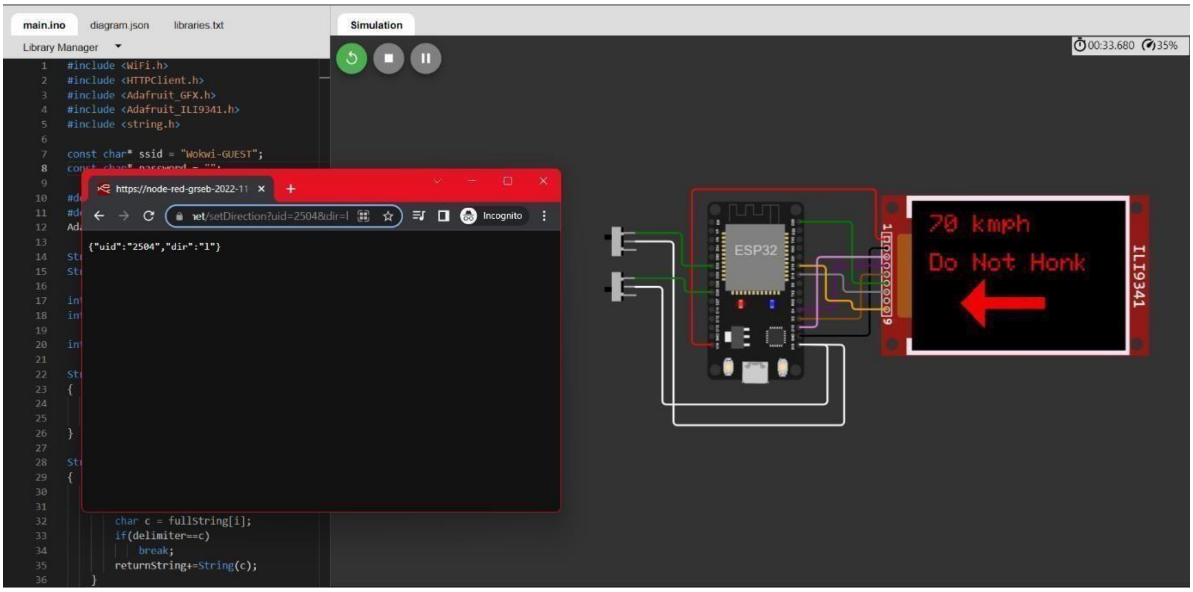
```
#include <WiFi.h>
#include <HTTPClient.h>
#include <Adafruit_GFX.h>
#include <Adafruit_ILI9341.h>
#include <string.h>

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

```
iet/setDirection?uid=2504&dir=r
```

```
{"uid":"2504","dir":"r"}
```

```
        char c = fullString[i];
        if(delimiter==c)
            break;
        returnString+=String(c);
    }
```



```
#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 = "";

#d
#d
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St

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in

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St
{


}

St
{


    char c = fullString[i];
    if(delimiter==c)
      break;
    returnString+=String(c);
  }
```

net/setDirection?uid=2504&dir=l

```
{"uid":"2504","dir":"l"}
```