# Assignment-4

| | |
|---|---|
| **Assignment Date** | **31.10.2022** |
| **Student Name** | **NANDHAKUMAR G** |
| **Student Roll No** | **19L228** |
| **Team Id** | **PNT2022TMID12813** |

**Question :**

**Write code and connections in wokwi for ultrasonic sensor.**

**Whenever distance is less than 100 cms send "alert" to ibm cloud and display in devicerecent events.**

## Solution :

## Code:

```
#include  <WiFi.h>
#include
<PubSubClient.h>
WiFiClient wifiClient;

String data3;
#define ORG "szro21"
#define DEVICE_TYPE
"aarthidevicetype"#define DEVICE_ID
"aarthideviceid" #define TOKEN
"0987654321"
#define speed 0.034
#define led 15

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
```

```
char  publishTopic[]  =  "iot-2/evt/Data/fmt/json";
char  topic[]  =  "iot-2/cmd/command/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);

void publishData();



const int trigpin=13;
const int echopin=12;
String command;
String data="";

long duration;
float dist;




void setup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin,
  OUTPUT);
  pinMode(echopin, INPUT);
```

```
  wifiConnect();
  mqttConnect();
}

void loop()
{
  bool isNearby = dist < 100;
  digitalWrite(led, isNearby);

  publishData();
  delay(500);

  if (!client.loop())
   {
    mqttConnect();
  }
}

void wifiConnect()
 {
  Serial.print("Connecting to ");
  Serial.print("Wifi");
  WiFi.begin("Wokwi-GUEST", "",
  6);
  while (WiFi.status() != WL_CONNECTED)
  {
    delay(500);
```

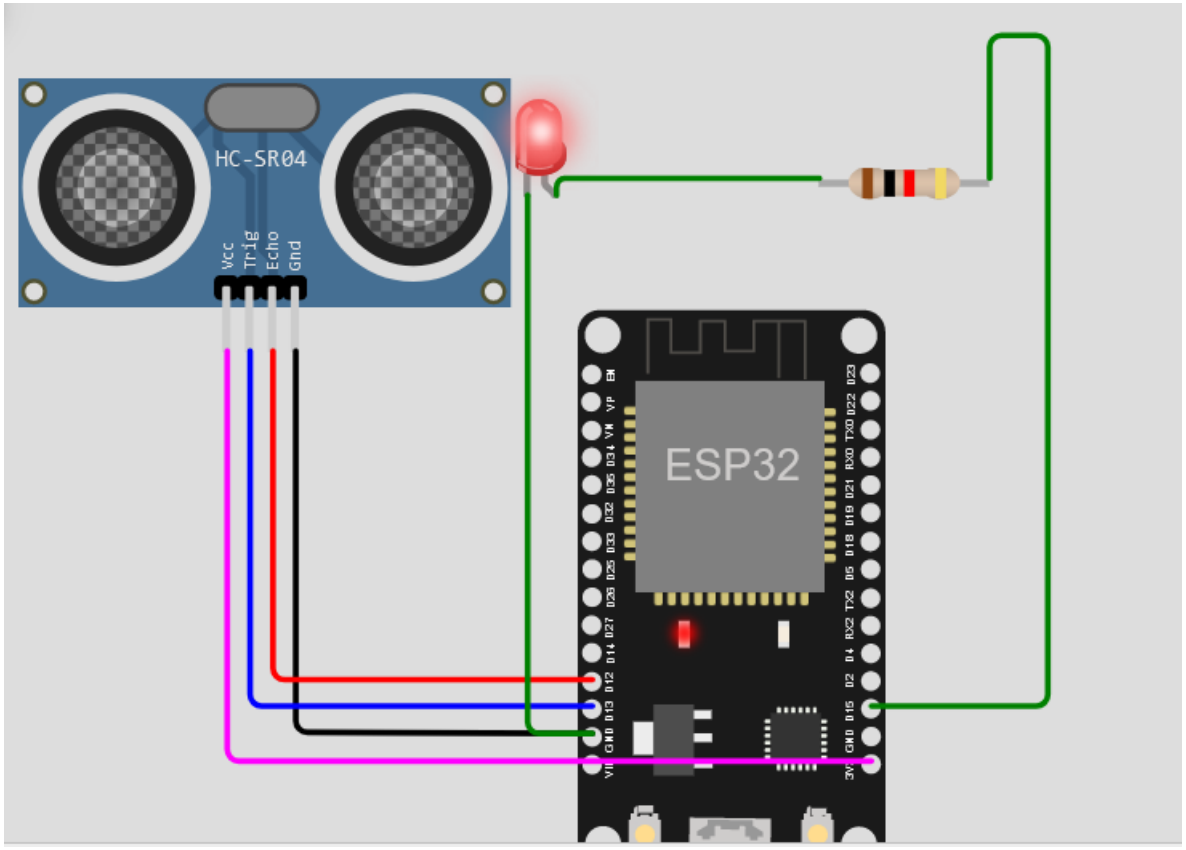
```
    Serial.print(".");
  }
  Serial.print("WiFi connected, IP address:
  ");Serial.println(WiFi.localIP());
}

void mqttConnect()
{
  if (!client.connected())
   {
    Serial.print("Reconnecting MQTT client to
    ");Serial.println(server);
    while (!client.connect(clientId, authMethod, token))
     {
      Serial.print(".")
      ;delay(500);
    }
    initManagedDevice()
    ;Serial.println();
  }
}

void initManagedDevice()
 {
  if (client.subscribe(topic))
  {
```

```
   // Serial.println(client.subscribe(topic));
   Serial.println("IBM subscribe to cmd
   OK");
  }
   else
   {
   Serial.println("subscribe to cmd FAILED");
  }
}
void publishData()
{
  digitalWrite(trigpin,LOW);
  digitalWrite(trigpin,HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin,LOW);
  duration=pulseIn(echopin,HIGH)
  ;dist=duration*speed/2;
  if(dist<100)
  {
   String payload = "{\"Alert
   Distance\":";payload += dist;
   payload += "}";

   Serial.print("\n");
   Serial.print("Sending payload:
   ");Serial.println(payload);
   if (client.publish(publishTopic, (char*) payload.c_str()))
```

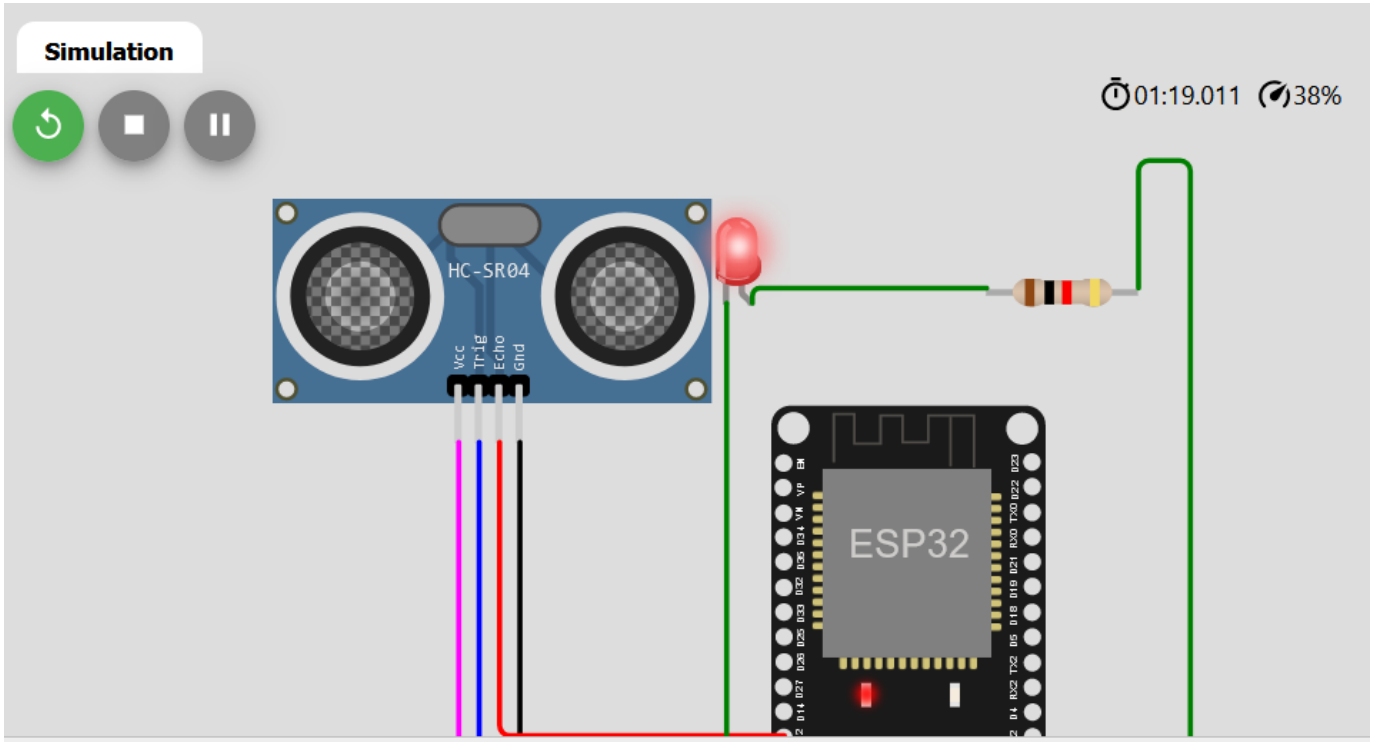
```
  {
   Serial.println("Publish OK");
  }

}
  if(dist>101 && dist<150)
  {
  String payload = "{\"Normal
  distance\":";payload += dist;
  payload += "}";

  Serial.print("\n");
  Serial.print("Sending payload:
  ");Serial.println(payload);
   if(client.publish(publishTopic, (char*) payload.c_str()))
    {
    Serial.println("Warning crosses 110cm -- it automaticaly of the loop");
    digitalWrite(led,HIGH);
  }
  else
  {
   Serial.println("Publish FAILED");
  }

}
```

```
  }
  void callback(char* subscribeTopic, byte* payload, unsigned int
payloadLength){
  Serial.print("callback invoked for
  topic:");Serial.println(subscribeTopic);
  for(int i=0; i<payloadLength; i++)
  {
    dist += (char)payload[i];
  }
  Serial.println("data:"+ data3);
  if(data3=="lighton")
  {
    Serial.println(data3);
    digitalWrite(led,HIGH
    );
  }
  data3="";
}
```

## Circuit Diagram :



## Output :




```
Connecting to Wifi..WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to szro21.messaging.internetofthings.ibmcloud.com
IBM subscribe to cmd OK


Sending payload: {"Alert Distance":58.97}
Publish OK

Sending payload: {"Alert Distance":58.94}
Publish OK
```