

## Assignment-4

Assignment Date	31.10.2022
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### 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 = "{\nAlert
Distance\n:";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");
}

}

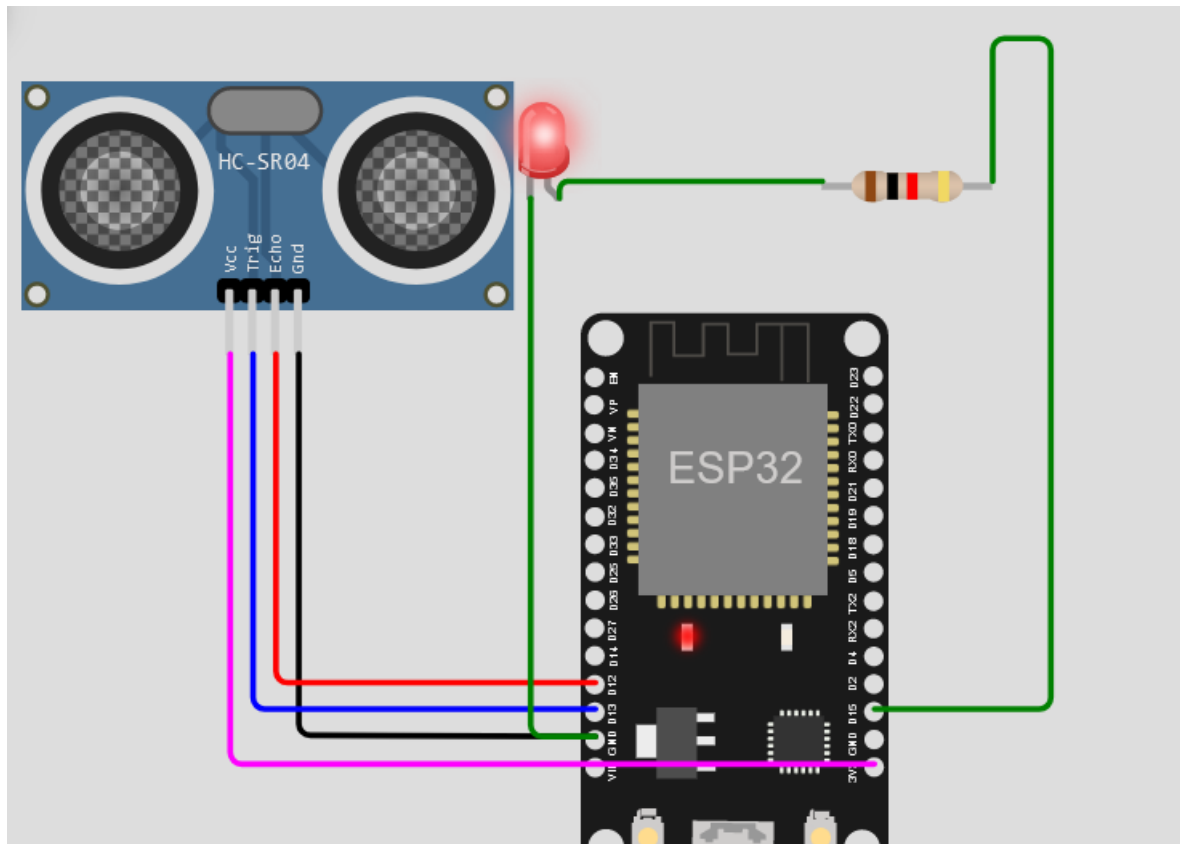
if(dist>101 && dist<150)
{
  String payload = "{\Normal
  distance\":";payload += dist;
  payload += "}";

  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 :

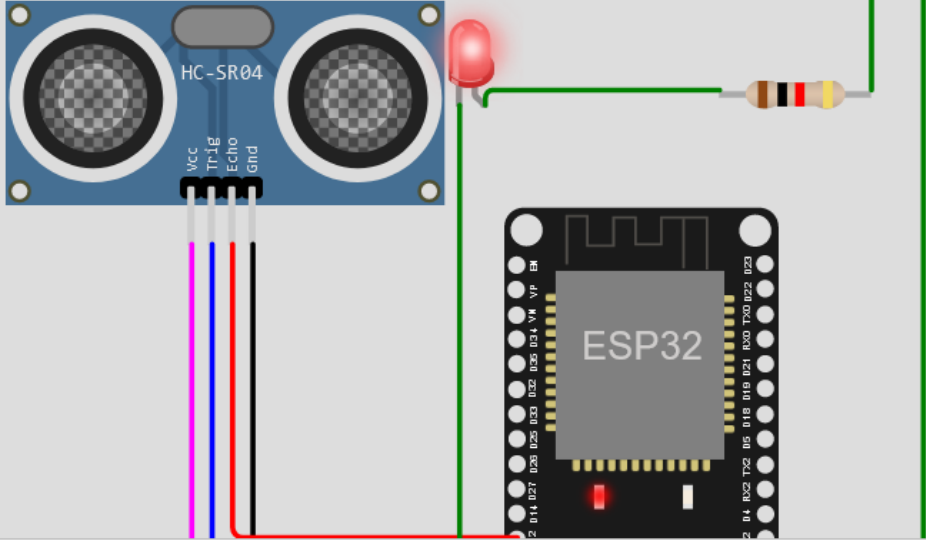




## Output :

**Simulation**

01:19.011 38%



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

Simulation controls: Run, Stop, Pause