Assignment-4

Assignment Date	**31.10.2022**
Student Name	**Sangeetha S**
Student Roll No	**811019106032**
Maximum Marks	**2 Marks**

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 device recent events.

Solution :

Wokwi Link

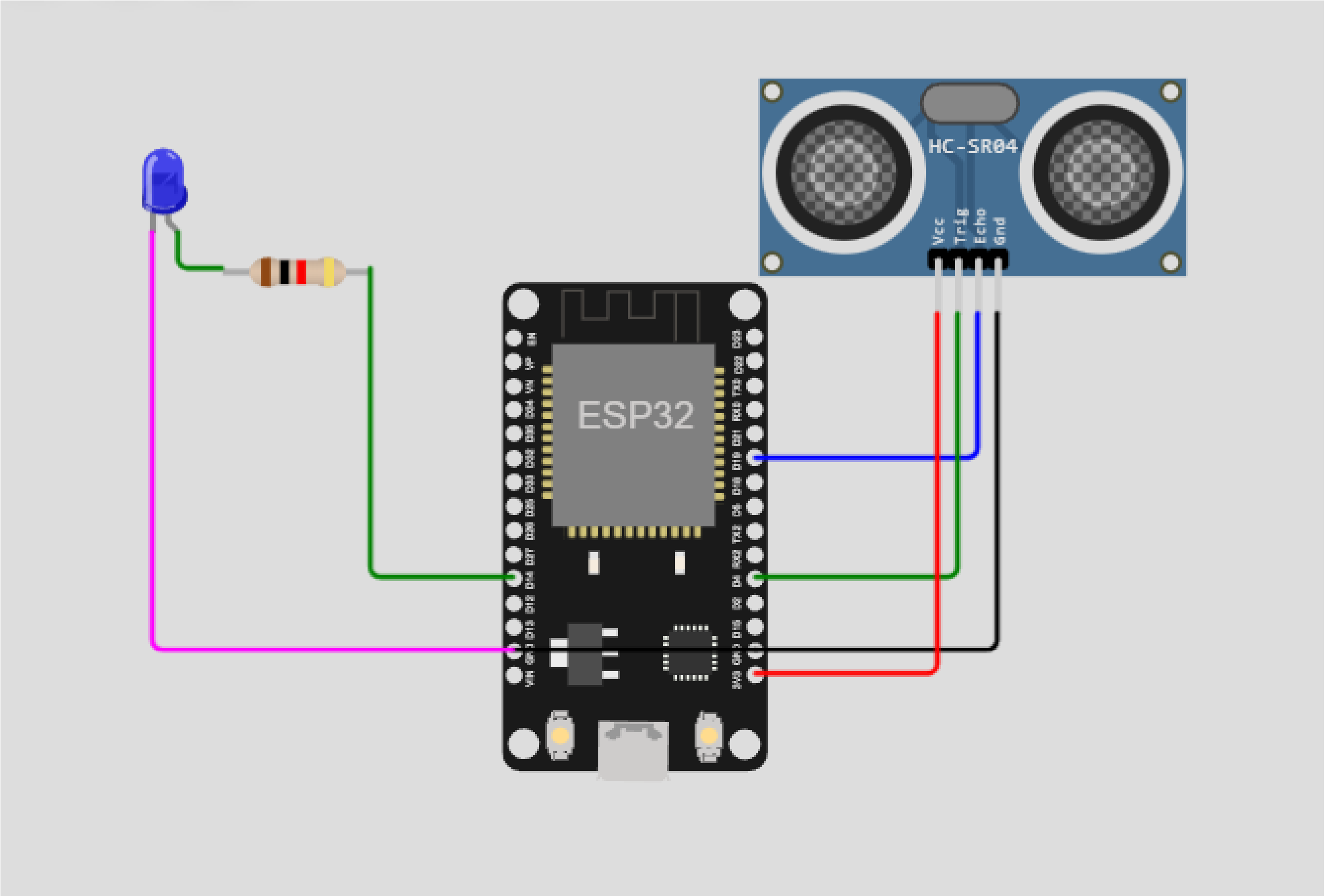
https://wokwi.com/projects/346963035247608403

Code :

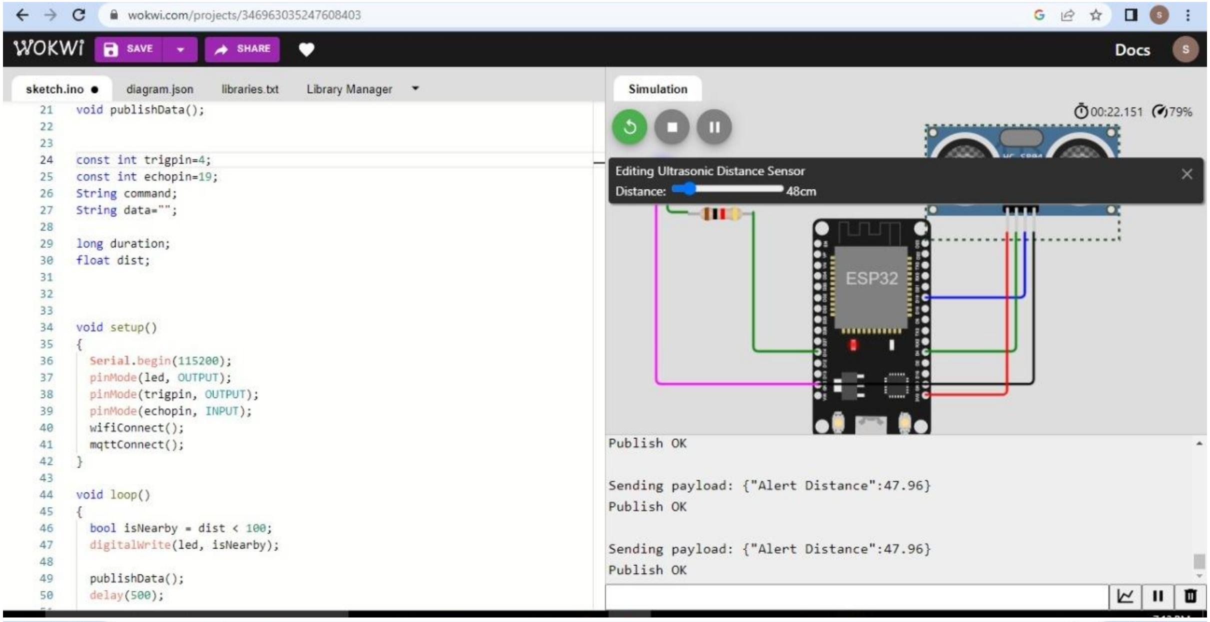
```
#include <WiFi.h>

#include <PubSubClient.h>


WiFiClient wifiClient;

String data3;


#define ORG "szro21"

#define DEVICE_TYPE "sangeedevicetype"

#define DEVICE_ID "sangeedeviceid"

#define TOKEN "0987654321"

#define speed 0.034

#define led 14


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=4;
const int echopin=19;
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 :



```
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  wifiConnect();
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}

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

  publishData();
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```

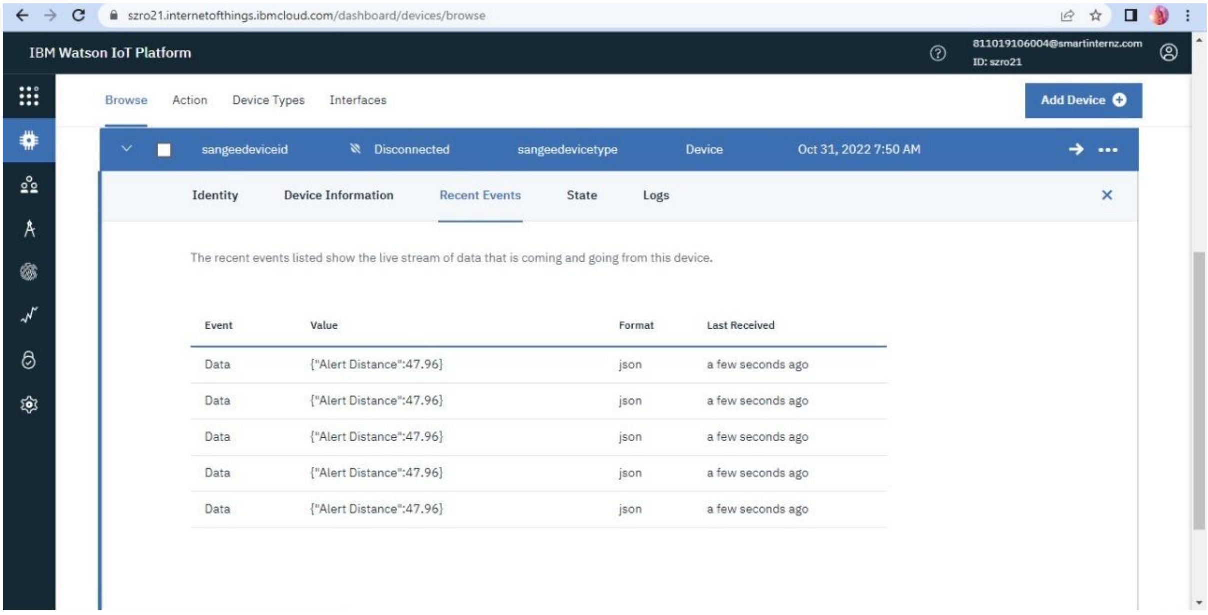
Editing Ultrasonic Distance Sensor

Distance: 48cm

```
Publish OK

Sending payload: {"Alert Distance":47.96}
Publish OK

Sending payload: {"Alert Distance":47.96}
Publish OK
```



	sangeedeviceid	Disconnected	sangeedevicetype	Device	Oct 31, 2022 7:50 AM

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"Alert Distance":47.96}	json	a few seconds ago
Data	{"Alert Distance":47.96}	json	a few seconds ago
Data	{"Alert Distance":47.96}	json	a few seconds ago
Data	{"Alert Distance":47.96}	json	a few seconds ago
Data	{"Alert Distance":47.96}	json	a few seconds ago