Project	Signs with smart connectivity for better road safety
Team ID	PNT2022TMID39232
workload	Assignment -4

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cmssend "alert" to ibm cloud and display in device recent events.

Program:

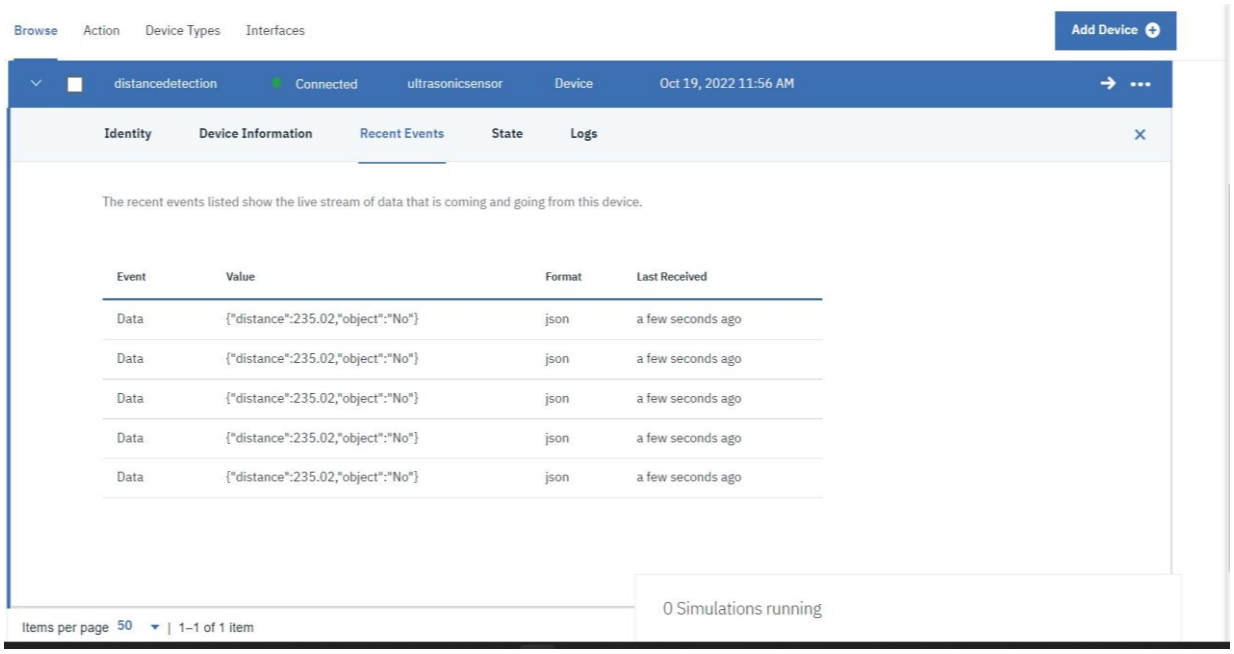
```
/*-----------------------------------------------------------------------------------------------------------------------
----*/


#include <WiFi.h>//library for wifi
#include <PubSubClient.h> //library for MQtt

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

/*-------credentials of IBM Accounts------*/

#define ORG "ezj2wy"                //IBM ORGANITION ID
#define DEVICE_TYPE "NodeMCU"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678"  //Token
String data3;
float dist;

//-------- Customise the above values --------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and format in
which data to be send
char subscribetopic[] = "iot-2/cmd/test/fmt/String";//cmd REPRESENT command type AND
COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication method char token[] = TOKEN;


char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id


//  -------------------------------------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient

PubSubClient client(server, 1883, callback ,wifiClient);
//calling the predefined client id by passing parameter like server id,portand wificredential

int LED = 4; int trig = 5; int echo = 18;
void setup()
{
  Serial.begin(115200);
  pinMode(trig,OUTPUT);
```

```
 pinMode(echo,INPUT);
 pinMode(LED, OUTPUT);
 delay(10);
 wificonnect();
 mqttconnect();
}

void loop()// Recursive Function
{
 digitalWrite(trig,LOW);
 digitalWrite(trig,HIGH);
 delayMicroseconds(10);
 digitalWrite(trig,LOW);
 float dur = pulseIn(echo,HIGH);
 float dist = (dur * 0.0343)/2;
 Serial.print ("Distancein cm");
 Serial.println(dist);

 PublishData(dist);
 delay(1000);
 if (!client.loop())
  { mqttconnect();
  }
}



/*.....retrieving toCloud.....*/

void PublishData(float dist)
 {  mqttconnect();               //function call for connecting to ibm
 /*creating the String in in form JSon to update the data to ibm cloud*/
   String object;




  if (dist <100)
   {
     digitalWrite(LED,HIGH);
     Serial.println("object is near");
     object = "Near";
    }
   else
   {
     digitalWrite(LED,LOW);
     Serial.println("no object found");
     object = "No";
    }

   String payload = "{\"distance\":"; payload += dist;
   payload += "," "\"object\":\""; payload += object;
   payload += "\"}";
```

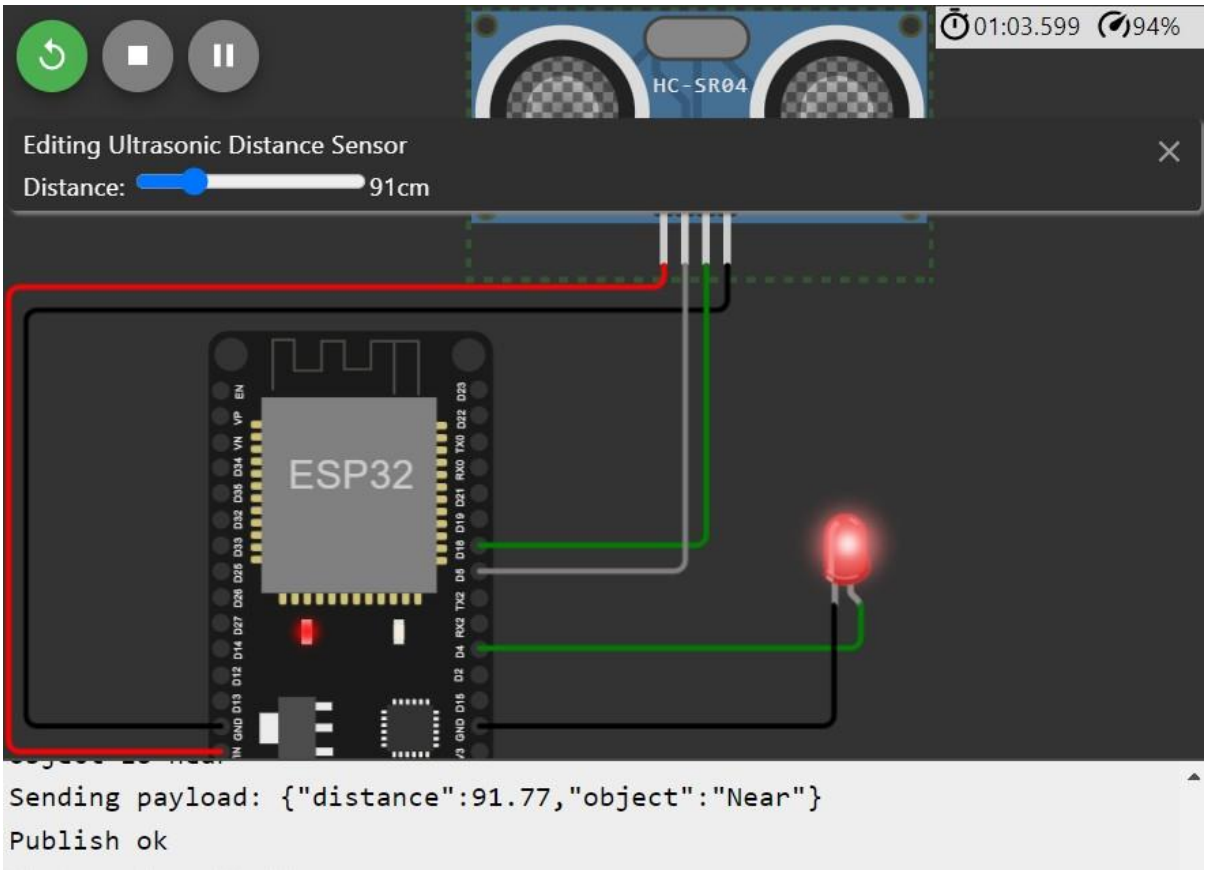
```
  Serial.print("Sending payload: ");
  Serial.println(payload);


 if (client.publish(publishTopic, (char*) payload.c_str()))
  {
   Serial.println("Publish ok");/*if it sucessfully upload data on the cloud then it will print publish ok in
Serial monitor
    or else it will print publish failed*/
  }
  else {
  Serial.println("Publish failed");
 }

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

  initManagedDevice();
  Serial.println();
 }
}

void wificonnect() //function defination for wificonnect
{
 Serial.println();
 Serial.print("Connecting to ");

 WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection
 while (WiFi.status() != WL_CONNECTED)
 { delay(500);
  Serial.print(".");
 }


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

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

```
  Serial.println((subscribetopic));
  Serial.println("subscribe to cmd OK");
   }
 else
  {
  Serial.println("subscribe to cmd 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++)
 {
   //Serial.print((char)payload[i]);
   data3 += (char)payload[i];
 }
 data3="";
}
```

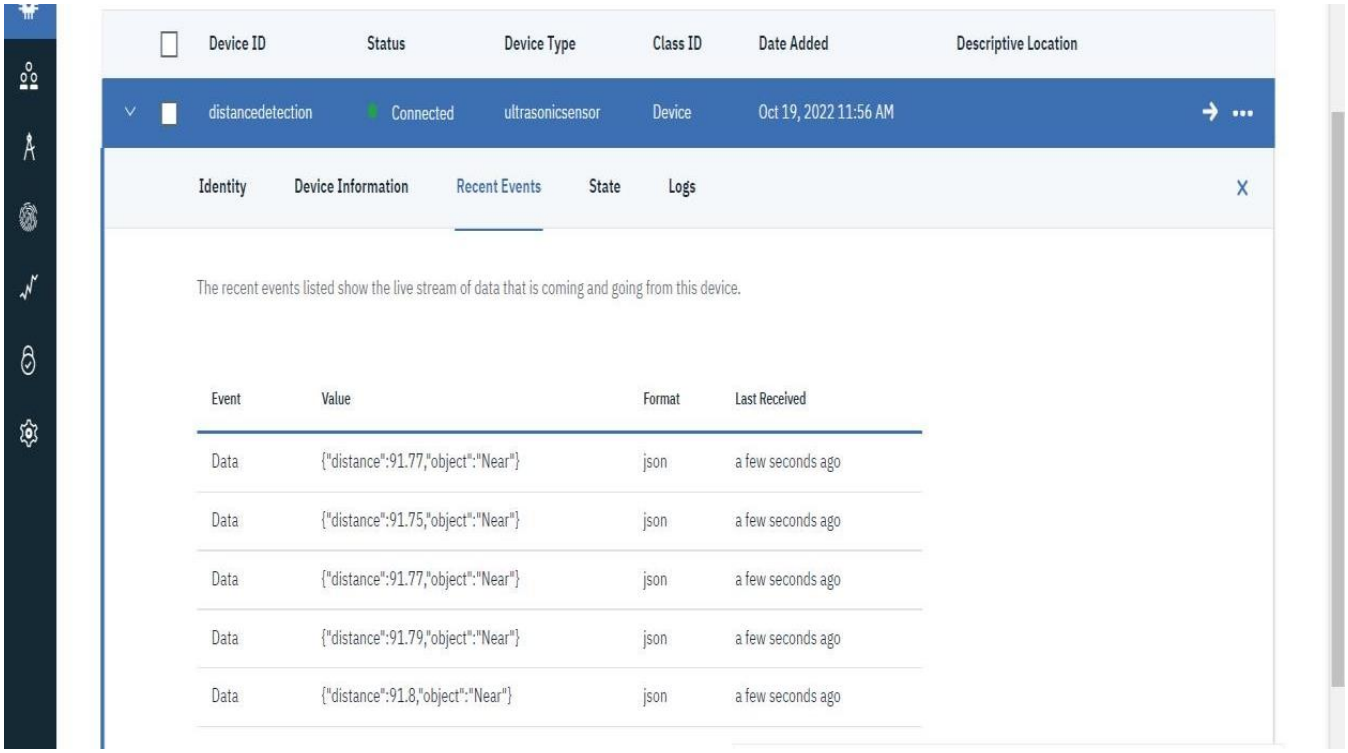
OutPut: Data sent to the IBM cloud device when the object is far



When object is nearer to the ultrasonic sensor



Data sent to the IBM cloud device when the object is near



https://wokwi.com/projects/348779089435296340