Assignment - 4

Ultrasonic sensor simulation in Wokwi

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Maximum Marks	2 Marks

Question-1:

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms send an “Alert” to IBM cloud and display in the device recent events.

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
 void callback(char* subscribetopic, byte* payload, unsigned
int payloadLength);

//-------credentials of IBM Accounts------
#define ORG "ytluse"//IBM ORGANITION ID
#define DEVICE_TYPE "2702"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "O+n)Eh+lNX0y3?rG!8"      //Token
String data3;

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char    publishTopic[]    =    "iot-2/evt/Data/fmt/json";    char
subscribetopic[]     =     "iot-2/cmd/test/fmt/String";     char
authMethod[] = "use-token-auth"; char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
WiFiClient;
PubSubClient client(server, 1883, callback
,wifiClient); const int trigPin = 5; const int echoPin
= 18; #define SOUND_SPEED 0.034 long duration;
float distance;

void setup() {
  Serial.begin(115200);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
```

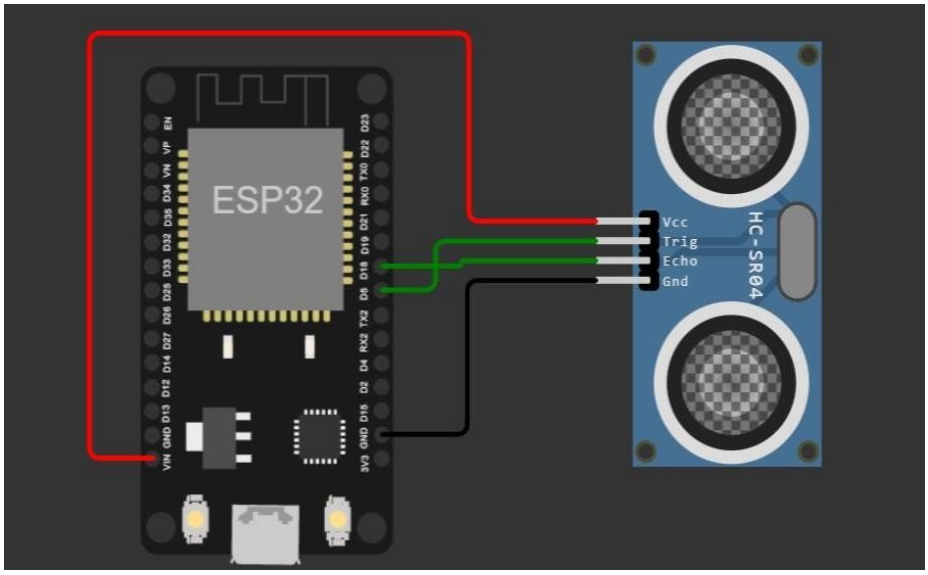
```
void   mqttconnect()   {   if
  (!client.connected()) {
    Serial.print("Reconnecting client to ");
    Serial.println(server);
    while (!!!client.connect(clientId, authMethod, token))
      { Serial.print("."); delay(500);
    }

     initManagedDevice();
     Serial.println();
  } } void
wificonnect()
{
  Serial.println();
  Serial.print("Connecting to ");

  WiFi.begin("Wokwi-GUEST", "", 6); 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];
  }
Serial.println("data: "+ data3);
data3="";
}
```

Circuit Diagram:



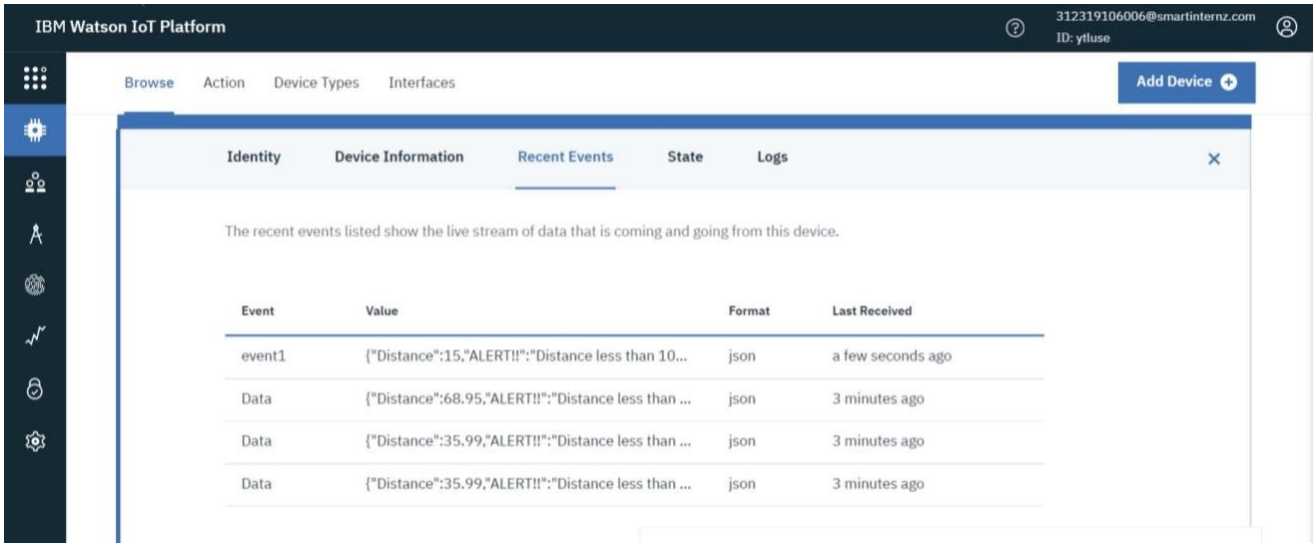
Output:

Wokwi output:

```
Connecting to ...
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 35.99
ALERT!!
Sending payload: {"Distance":35.99,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 35.99
ALERT!!
Sending payload: {"Distance":35.99,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 68.95
ALERT!!
Sending payload: {"Distance":68.95,"ALERT!!":"Distance less than 100cms"}
Publish ok
```

IBM cloud output:



Wokwi simulation link:

https://wokwi.com/projects/346236324918854227