Assignment -4

Assignment Date	1 November 2022
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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. Upload document with wokwi share link and images of ibm cloud.

Solution:

```
#include <WiFi.h>

#include <WiFiClient.h>

#include <PubSubClient.h>

const int trigPin = 5;

const int echoPin = 18;

//define sound speed in cm/uS

#define SOUND_SPEED 0.034

#define CM_TO_INCH 0.393701

long duration;

float distanceCm;

float distanceInch;



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

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


#define ORG "0sqd61"//IBM ORGANITION ID

#define DEVICE_TYPE "team12iot"//Device type mentioned in ibm watson IOT Platform

#define DEVICE_ID "12"//Device ID mentioned in ibm watson IOT Platform
```

```
#define TOKEN "-J2fAo?G5?M96cnuMM"     //Token
String data3;




//-------- 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);


void setup() {
  Serial.begin(115200); // Starts the serial communication
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input
  Serial.println();
  wificonnect();
  mqttconnect();

}


void loop() {
  // Clears the trigPin
```

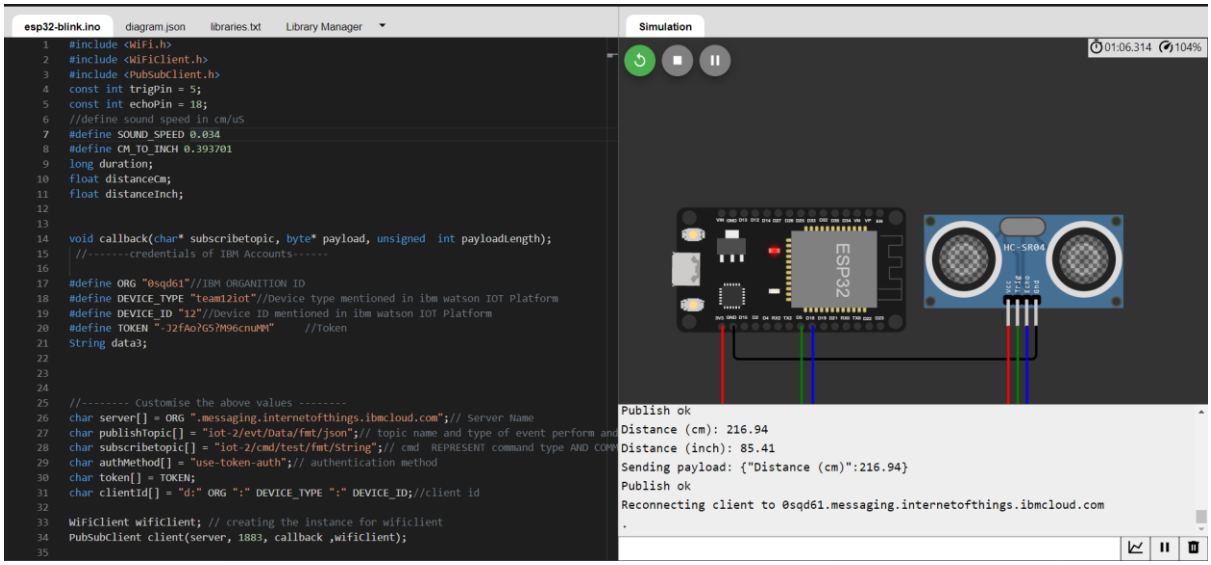
```
 digitalWrite(trigPin, LOW);
 delayMicroseconds(2);
 // Sets the trigPin on HIGH state for 10 micro seconds
 digitalWrite(trigPin, HIGH);
 delayMicroseconds(10);
 digitalWrite(trigPin, LOW);

 // Reads the echoPin, returns the sound wave travel time in microseconds
 duration = pulseIn(echoPin, HIGH);

 // Calculate the distance
 distanceCm = duration * SOUND_SPEED/2;

 // Convert to inches
 distanceInch = distanceCm * CM_TO_INCH;

 // Prints the distance in the Serial Monitor
 Serial.print("Distance (cm): ");
 Serial.println(distanceCm);
 Serial.print("Distance (inch): ");
 Serial.println(distanceInch);

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

```
 void PublishData(float Cm) {
 mqttconnect();//function call for connecting to ibm
 /*
   creating the String in in form JSon to update the data to ibm cloud
 */
 String payload = "{\"Distance (cm)\":";
 payload += Cm;
 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];
 }
}
```

Wokwi link: https://wokwi.com/projects/347025068950291027



Images of ibm cloud: