ASSIGNMENT IV

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REGISTER NUMBER : 210419104172

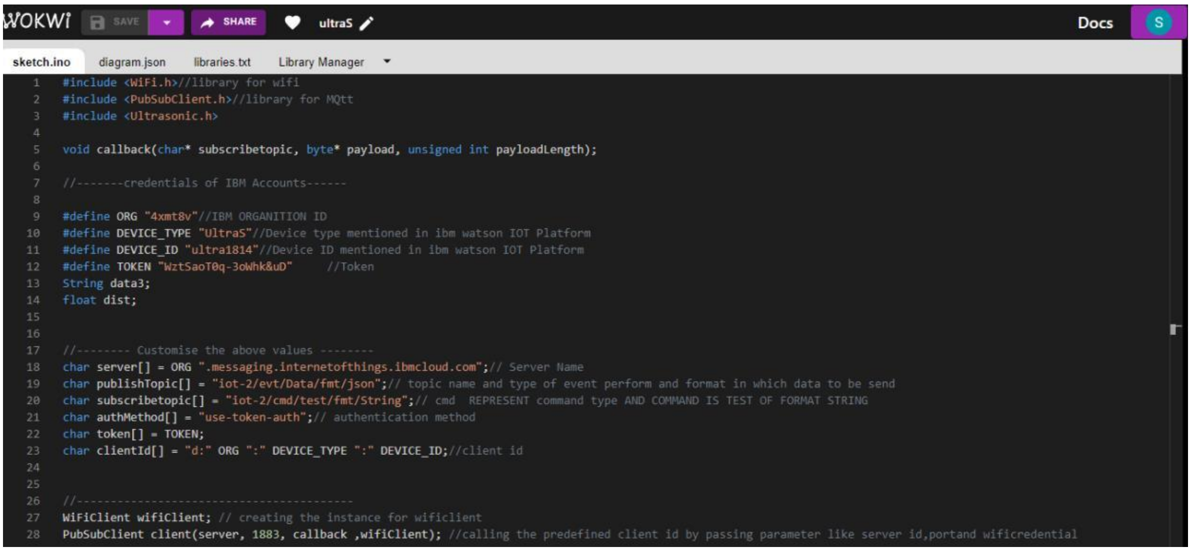
Question:

Write code and connections in wokwi for ultrasonic sensor. Whenever the distance is less than 100cm sent “alert” to IBM cloud and display in device recent.

WOKWI LINK:

https://wokwi.com/projects/347469744763306579

CODE:



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

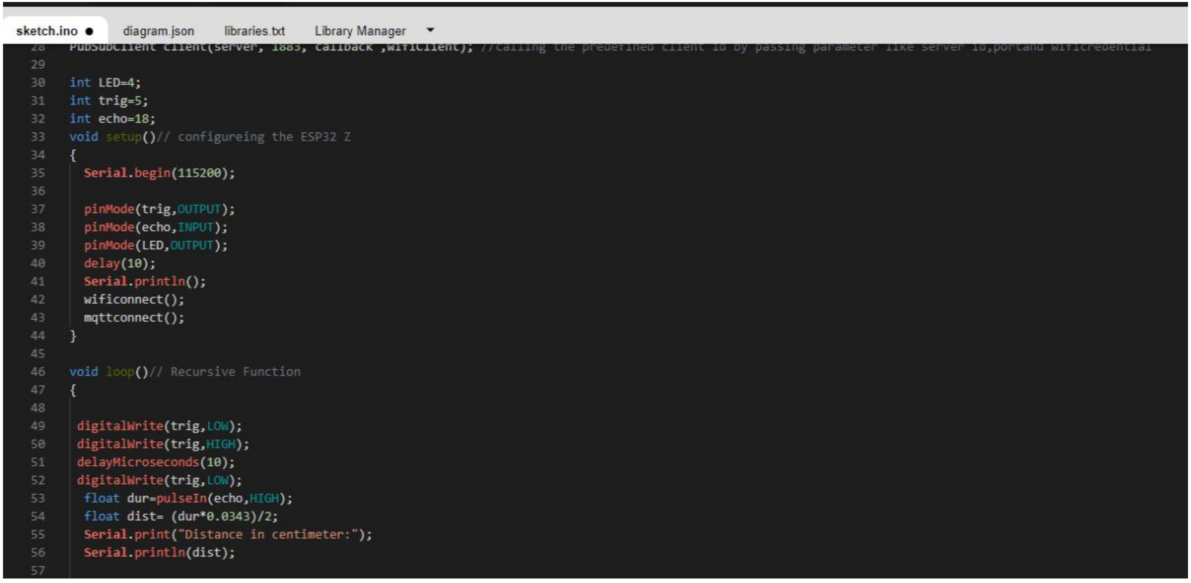
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

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

#define ORG "4xmt8v"//IBM ORGANITION ID
#define DEVICE_TYPE "UltraS"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "ultra1814"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "WztSaoT0q-3oWhk&uD"     //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
```



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

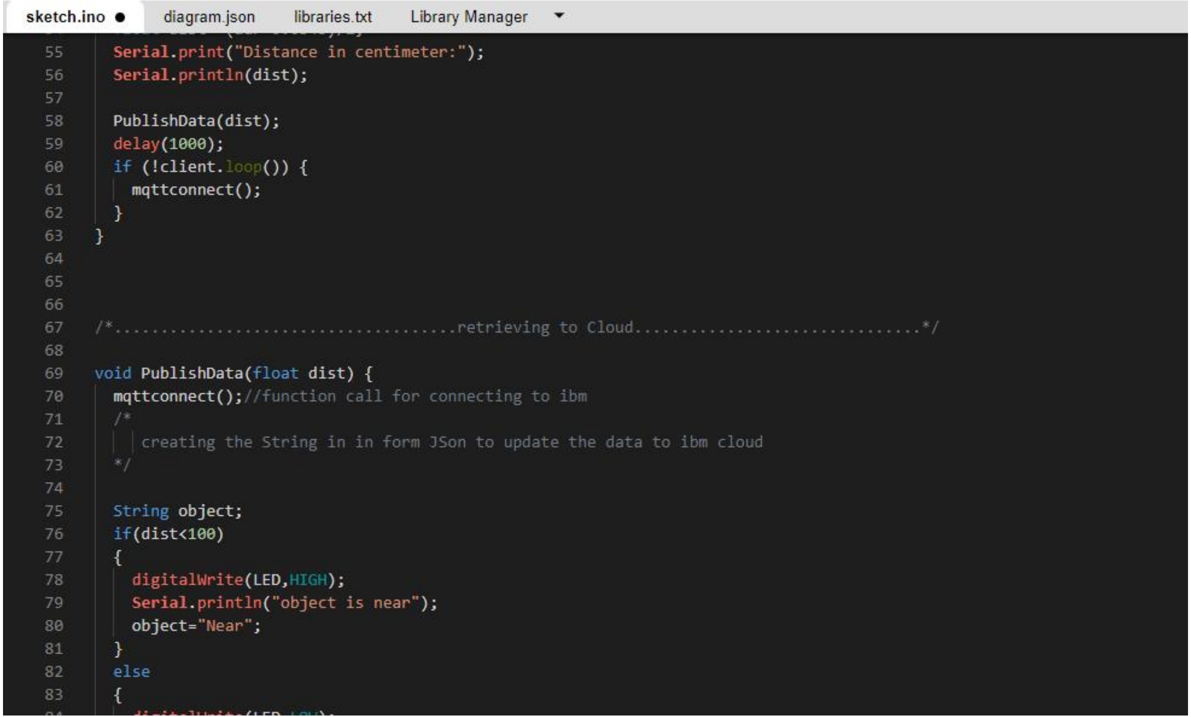
int LED=4;
int trig=5;
int echo=18;
void setup()// configureing the ESP32 Z
{
  Serial.begin(115200);

  pinMode(trig,OUTPUT);
  pinMode(echo,INPUT);
  pinMode(LED,OUTPUT);
  delay(10);
  Serial.println();
  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("Distance in centimeter:");
  Serial.println(dist);

```



```
  Serial.print("Distance in centimeter:");
  Serial.println(dist);

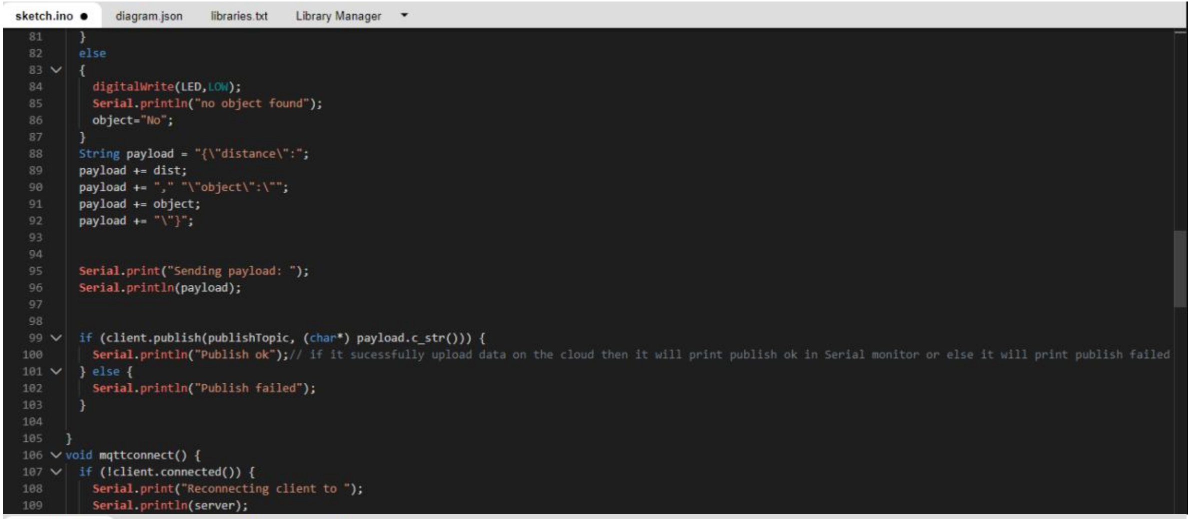
  PublishData(dist);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}



/*....................................retrieving to Cloud...............................*/

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
  {
```

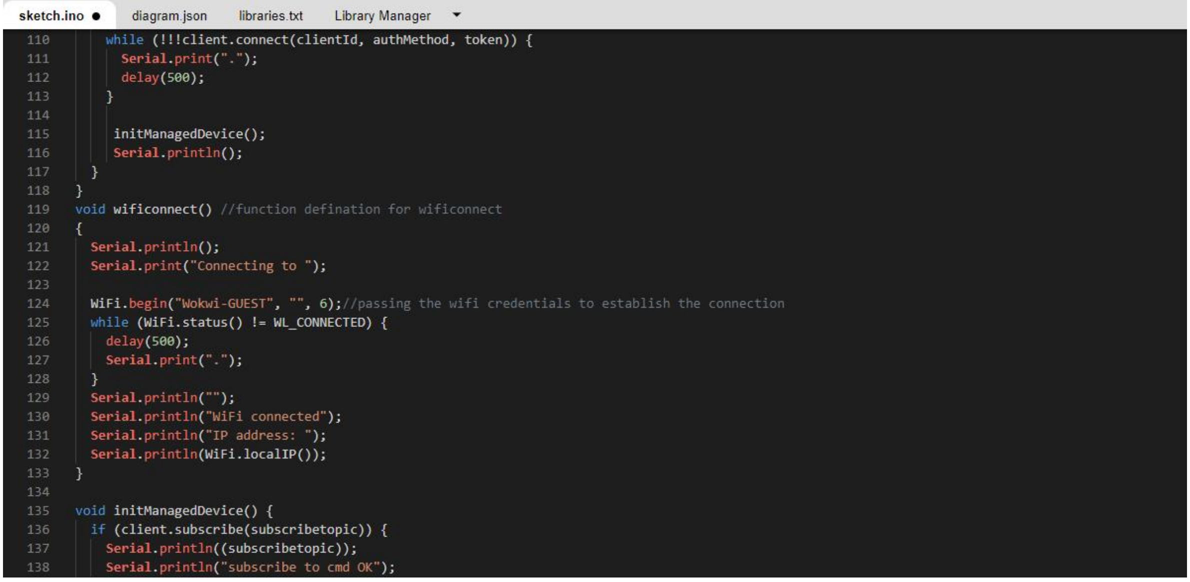


```
  }
  else
  {
    digitalWrite(LED,LOW);
    Serial.println("no object found");
    object="No";
  }
  String payload = "{\"distance\":";
  payload += dist;
  payload += "," "\"object\":\"";
  payload += object;
  payload += "\"}";


  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);
```

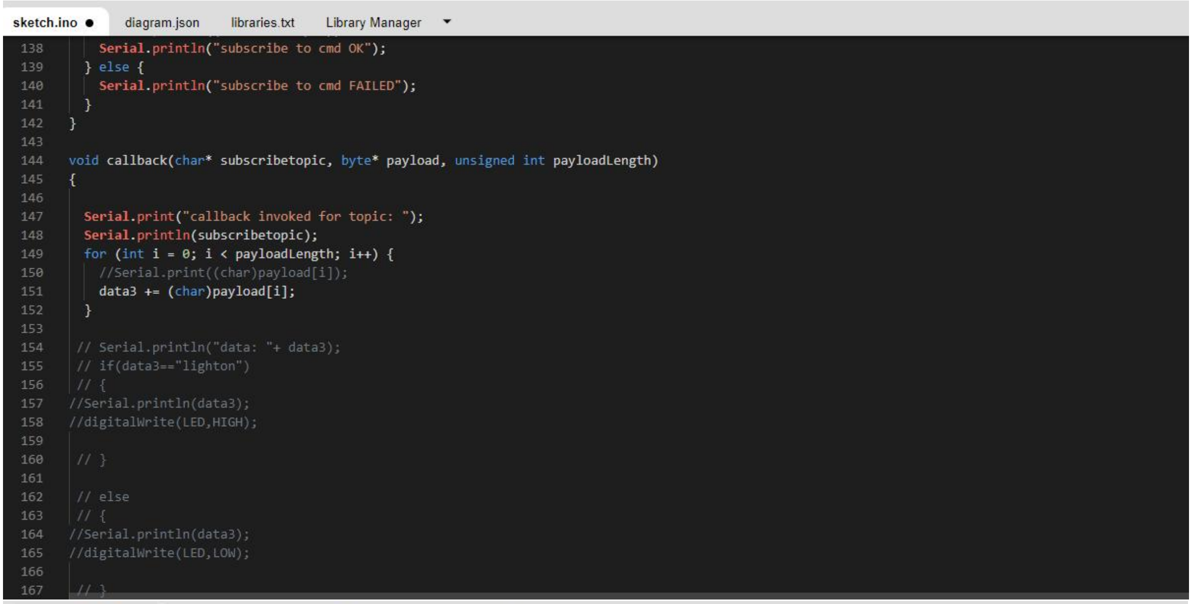


```
    while (!!!client.connect(clientId, authMethod, token)) {
      Serial.print(".");
      delay(500);
    }

    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");
```



```
    Serial.println("subscribe to cmd OK");
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}

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

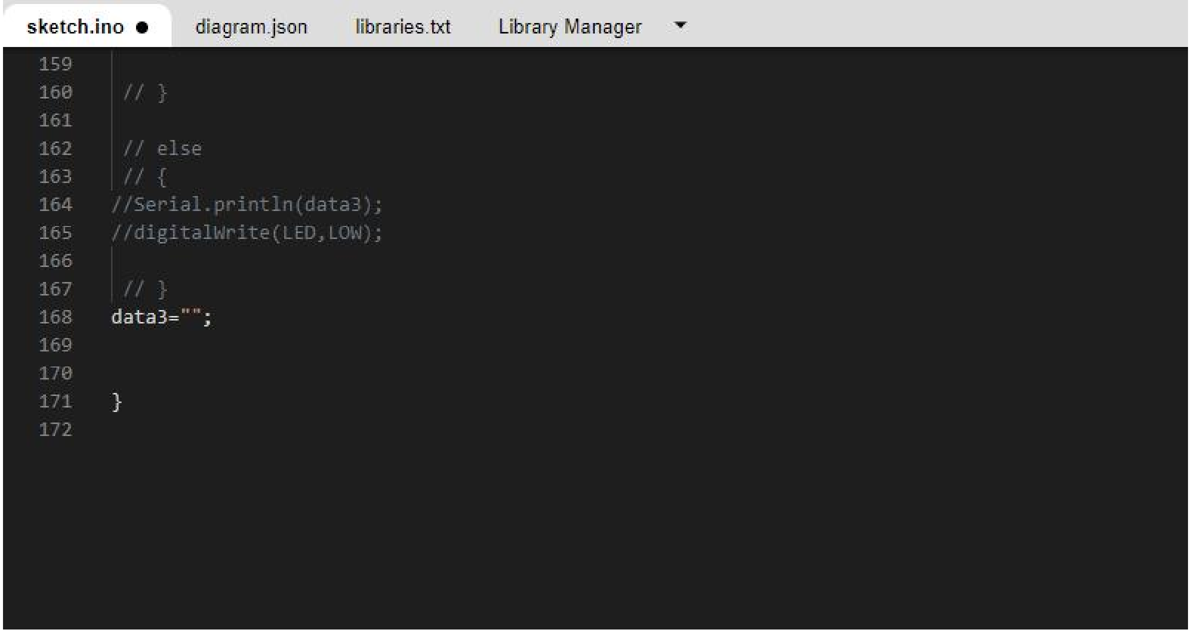
  Serial.print("callback invoked for topic: ");
  Serial.println(subscribetopic);
  for (int i = 0; i < payloadLength; i++) {
    //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
  }

 // Serial.println("data: "+ data3);
 // if(data3=="lighton")
 // {
//Serial.println(data3);
//digitalWrite(LED,HIGH);

 // }

 // else
 // {
//Serial.println(data3);
//digitalWrite(LED,LOW);

 // }
```



```

 // }

 // else
 // {
//Serial.println(data3);
//digitalWrite(LED,LOW);

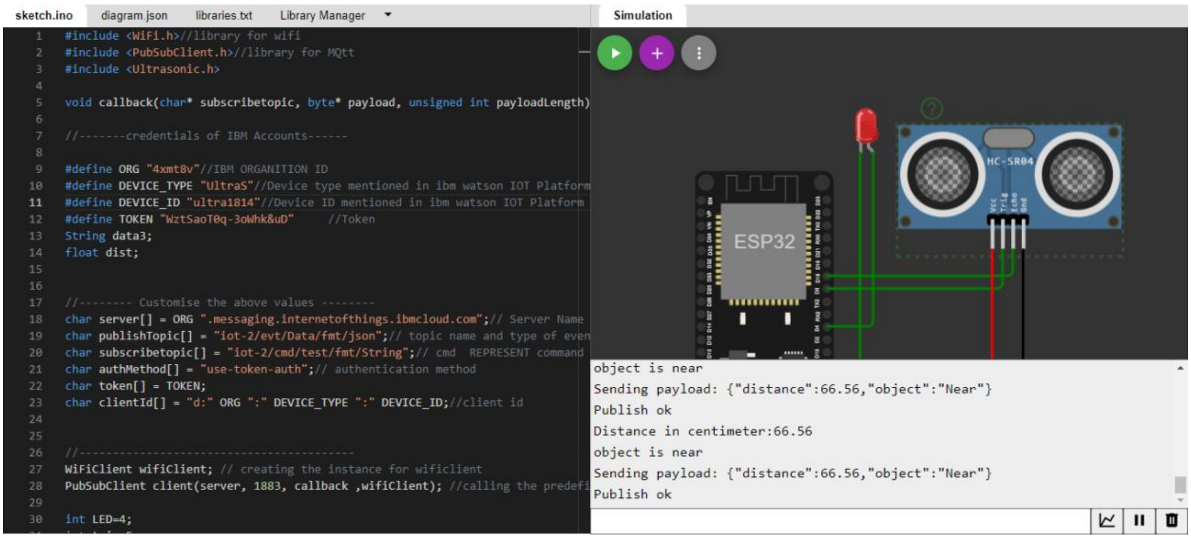
 // }
```

```
data3="";


}

```

OUTPUT:



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char token[] = TOKEN;
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//-----------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefi

int LED=4;
```

```
object is near
Sending payload: {"distance":66.56,"object":"Near"}
Publish ok
Distance in centimeter:66.56
object is near
Sending payload: {"distance":66.56,"object":"Near"}
Publish ok
```