PROBLEM STATEMENT:

IoT BASED GAS LEAKAGE MONITORING AND ALERTING SYSTEM

DOMAIN:

INTERNET OF THINGS

ASSIGNMENT 4:

DISTANCE DETECTION USING ULTRASONIC SENSOR

BY

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QUESTION-1:

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.

WOKWI LINK:

https://wokwi.com/projects/347864475598062163

CODE:

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


void callback(char* subscribetopic,byte* payload,unsignedint payloadLength);
//-------credentials of IBM Accounts------
#define ORG "4ffomx"//IBM ORGANITION ID
#define DEVICE_TYPE "esp32-connected"//Device type mentioned in ibm watson IOT
Platform
#define DEVICE_ID "karthicrajalv"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "9629974338"      //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;
voidsetup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED,OUTPUT);
delay(10);
wificonnect();
mqttconnect();
}
voidloop()// 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 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
  {
    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{
```

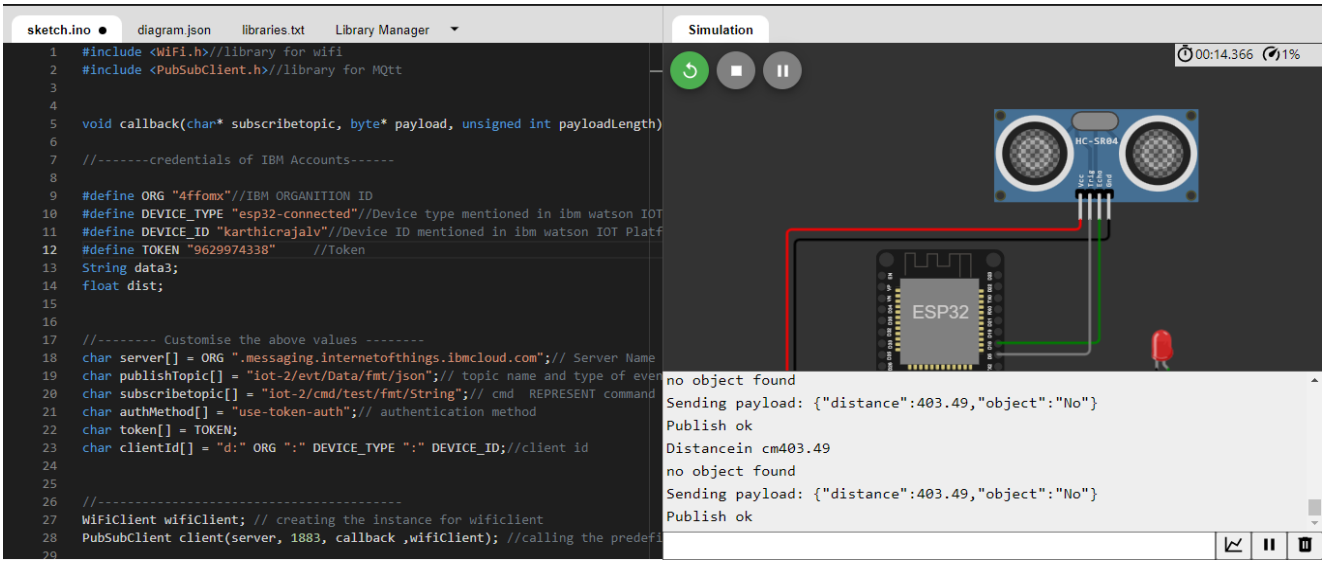
```
    Serial.println("subscribe to cmd FAILED");
  }
}
void callback(char* subscribetopic,byte* payload,unsignedint payloadLength)
{

  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=="Near")
//   {
// Serial.println(data3);
// digitalWrite(LED,HIGH);

//   }
//   else
//   {
// Serial.println(data3);
// digitalWrite(LED,LOW);
//   }
data3="";
}
```

OUTPUT:



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