Assignment-4

DistanceDetectionUsingUltrasonicSens
or

AssignmentDate	26October2022
StudentName	S.NACHAMMAI
StudentRollNumber	830119106026
MaximumMarks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cmssend"alert"toIBMcloudanddisplayindevicerecentevents.

WOKWILINK:https://wokwi.com/projects/346574219953308244

CODE:

```
#include<WiFi.h>//libraryforwifi#include
<PubSubClient.h>//libraryforMQtt


voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLength);

//------credentialsofIBMAccounts------

#defineORG"f59trs"//IBMORGANITIONID
#defineDEVICE_TYPE"ultrasonicsensor"//DevicetypementionedinibmwatsonIOTPl
atform
#defineDEVICE_ID"distancedetection"//DeviceIDmentionedinibmwatsonIOTPla
tform
#defineTOKEN"AlGMGaaF01nawa1QA3"
//TokenStringdata3;
floatdist;


//-------Customisetheabovevalues--------
charserver[]=ORG".messaging.internetofthings.ibmcloud.com";//ServerName
charpublishTopic[]="iot-
2/evt/Data/fmt/json";//topicnameandtypeofeventperformandformatinwhich
datatobesend
charsubscribetopic[]="iot-2/cmd/test/fmt/String";//
cmdREPRESENTcommandtypeANDCOMMANDISTESTOFFORMATSTRING
char authMethod[] = "use-token-auth";// authentication methodchar token[] =
TOKEN;char clientId[] ="d:"ORG ":"DEVICE_TYPE ":"DEVICE_ID;//clientid


//                                                    -
WiFiClientwifiClient; //creatingtheinstanceforwificlient
```

```
PubSubClientclient(server,1883,callback,wifiClient);
//callingthe
predefinedclientidbypassingparameterlikeserverid,portandwificredential

int LED = 4;
inttrig=5;intecho
=18;voidsetup()
{
Serial.begin(115200);pin
Mode(trig,OUTPUT);pin
Mode(echo,INPUT);pinM
ode(LED,
OUTPUT);delay(10);
wificonnect();mqttconne
ct();
}
voidloop()//RecursiveFunction
{

  digitalWrite(trig,LOW);di
    gitalWrite(trig,HIGH);d
    elayMicroseconds(10);
    digitalWrite(trig,LOW);
    floatdur=pulseIn(echo,HIGH);floatdist
    = (dur * 0.0343)/2;
    Serial.print("Distanceincm");Serial.prin
    tln(dist);


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



/*                                    retrievingto
Cloud                                                                    */

voidPublishData(floatdist){mqttconnect();//functioncallforconnecti
    ngtoibm
    /*
         creatingtheStringininformJSontoupdatethedatatoibmcloud
    */
    Stringobject;
```

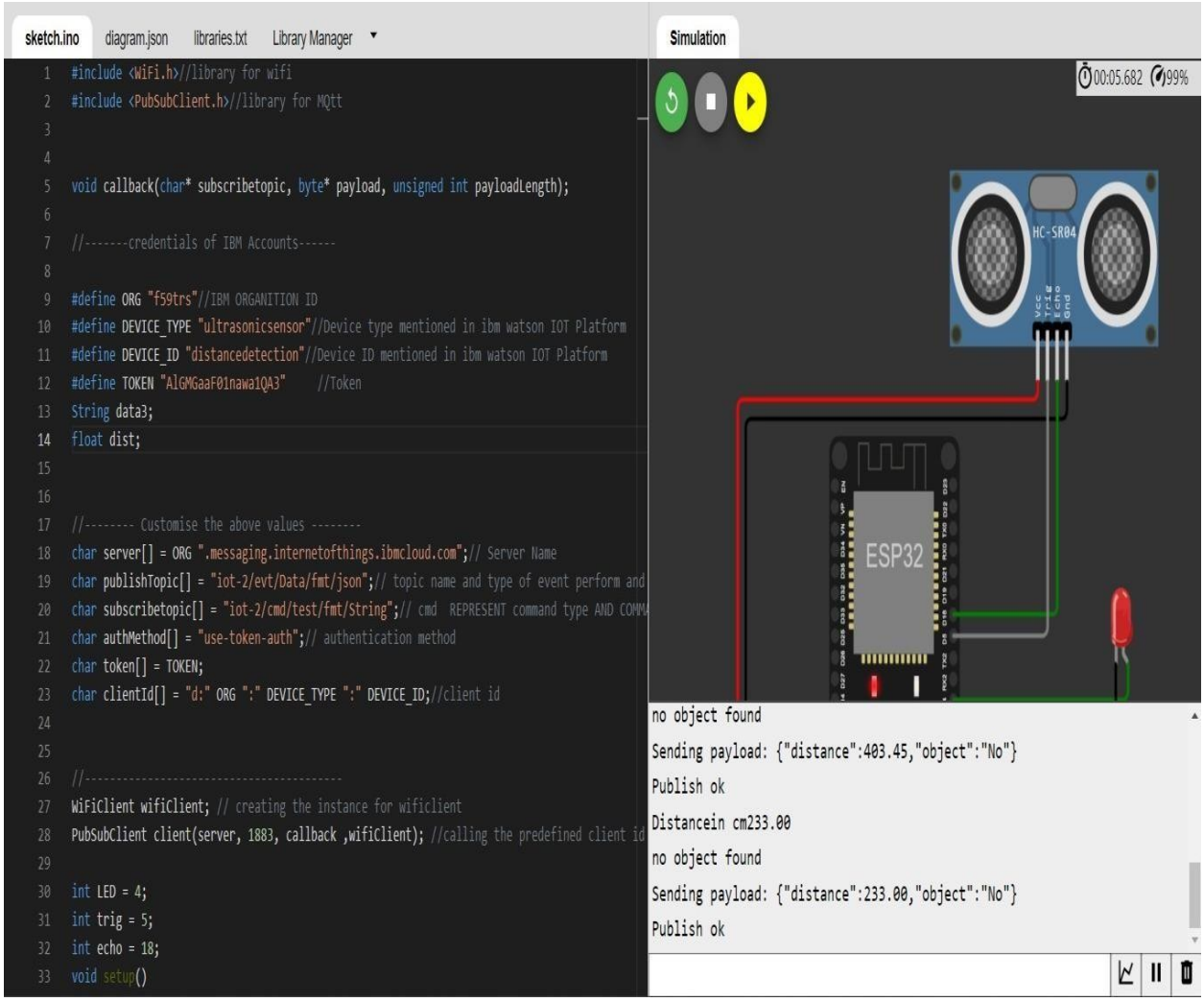
```
  if(dist<100)
  {
    digitalWrite(LED,HIGH);Serial.printl
    n("objectisnear");object="Near";
  }
  else
  {
    digitalWrite(LED,LOW);
    Serial.println("noobjectfound");object=
    "No";
  }

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


  Serial.print("Sendingpayload:");
  Serial.println(payload);




  if(client.publish(publishTopic,(char*)payload.c_str())){
    Serial.println("Publishok");//ifitsucessfullyuploaddataonthecloudthenitwillprin
tpublishokinSerialmonitor orelseitwillprintpublishfailed
  }else{
    Serial.println("Publishfailed");
  }

}
voidmqttconnect(){
  if (!client.connected())
    { Serial.print("Reconnectingclientto");Serial.p
    rintln(server);
    while(!!!client.connect(clientId,authMethod,token)) {
      Serial.print(".");
      delay(500);
    }

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

```
voidwificonnect()//functiondefinationforwificonnect
{
  Serial.println();
  Serial.print("Connectingto");

  WiFi.begin("Wokwi-
GUEST","",6);//passingthewificredentialstoestablishtheconnection
  while (WiFi.status() != WL_CONNECTED)
    {delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFiconnected");Serial.p
  rintln("IP address:
  ");Serial.println(WiFi.localIP());
}

voidinitManagedDevice(){
  if (client.subscribe(subscribetopic))
    { Serial.println((subscribetopic));Serial.println("subscribetoc
    mdOK");
  }else{
    Serial.println("subscribetocmdFAILED");
  }
}

voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLength)
{

  Serial.print("callbackinvokedfor topic:");
  Serial.println(subscribetopic);
  for(inti= 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);
```

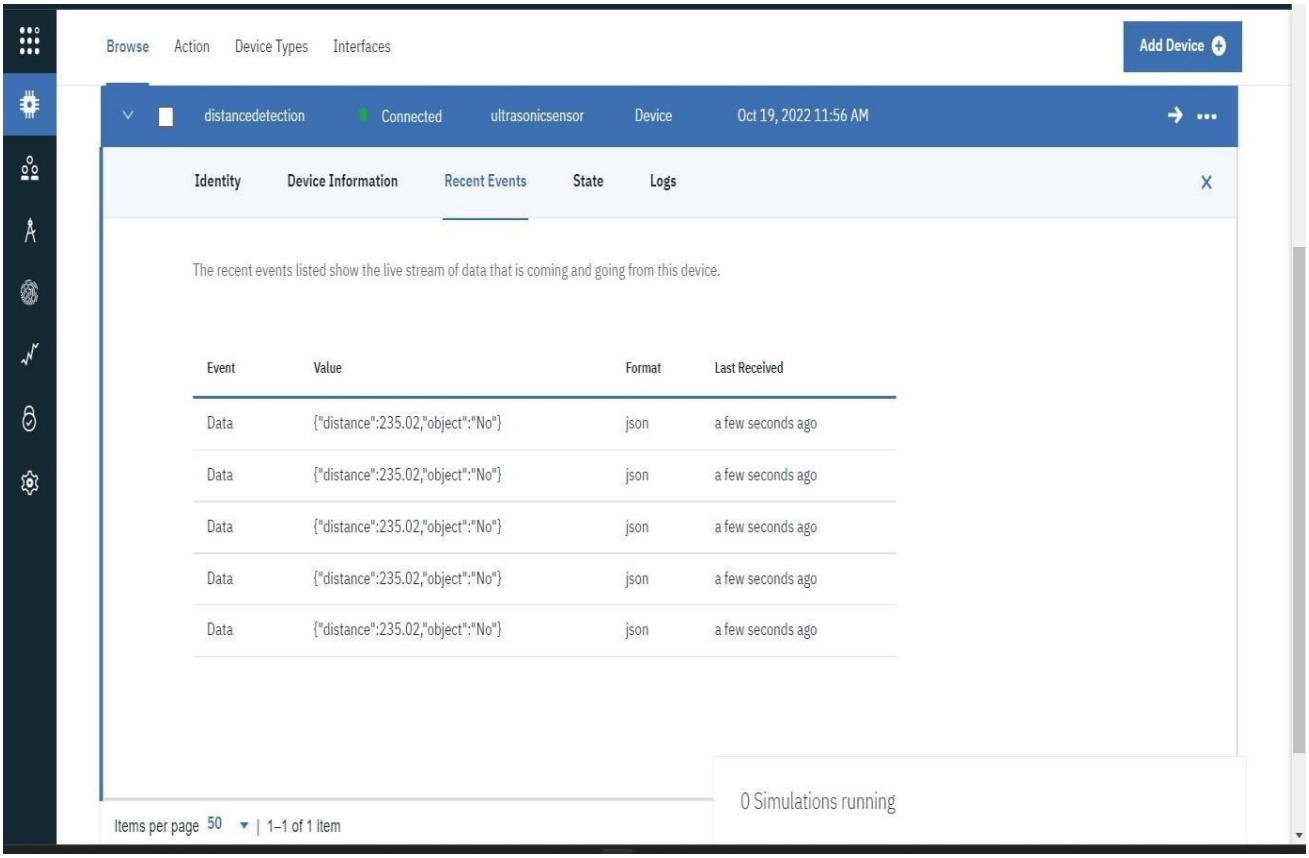
```
//digitalWrite(LED,LOW);

//
        }dat
a3="";
```

OUTPUT:

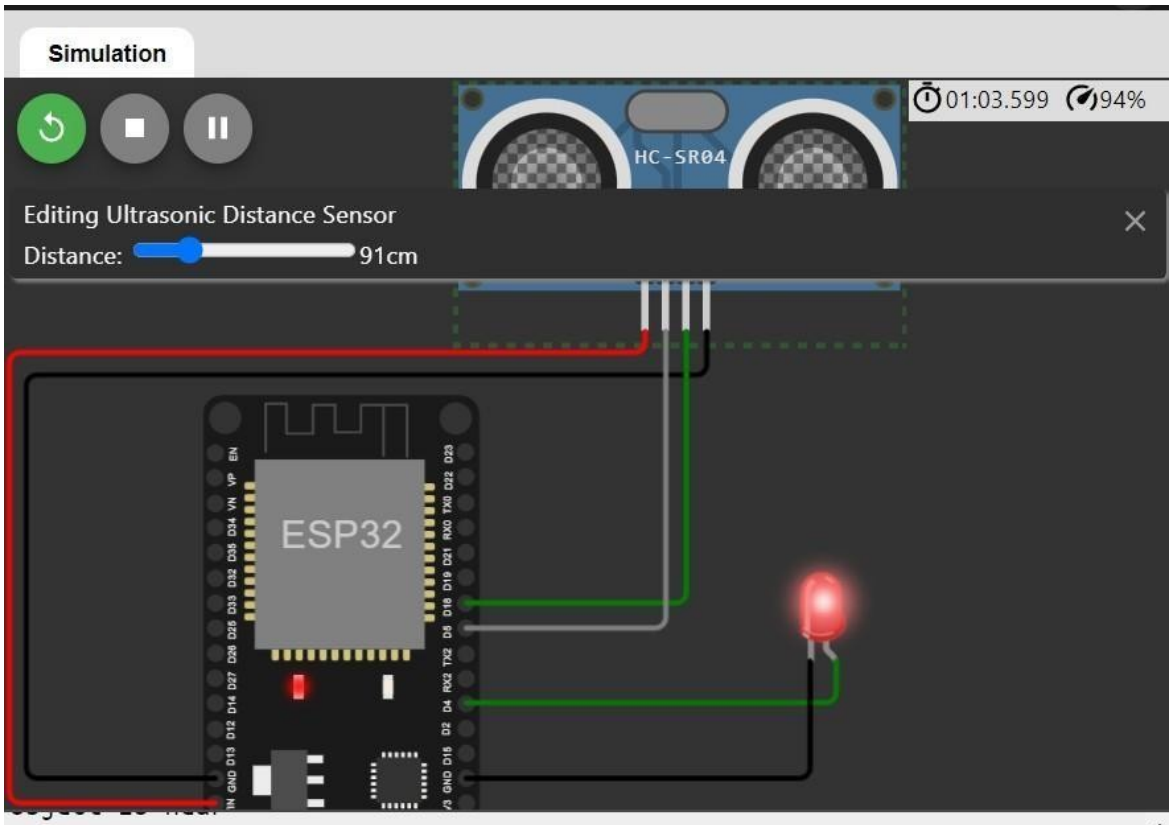
Whenobject isnotneartotheultrasonicsensor



DatasenttotheIBMclouddevicewhentheobject is far



Whenobjectisnearertotheultrasonicsensor




```
Sending payload: {"distance":91.77,"object":"Near"}
Publish ok
Distancein cm91.77
object is near
Sending payload: {"distance":91.77,"object":"Near"}
Publish ok
Distancein cm91.77
```

DatasenttotheIBMclouddevicewhentheobjectisnear