Assignment-4

DistanceDetectionUsingUltrasonicSensor

AssignmentDate	19October2022
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MaximumMarks	4 Marks

Question-1:

Writecodeandconnectionsinwokwiforultrasonicsensor.Wheneverdistanceislessthan100cms send "alert" to ibm cloud and display in device recent events.

WOKWILINK: https://wokwi.com/projects/345964118720643668

CODE:

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


voidcallback(char*subscribetopic,byte*payload,unsignedint
payloadLength);

//-------credentialsofIBMAccounts------ #define

ORG "f59trs"//IBM ORGANITION ID
#defineDEVICE_TYPE"ultrasonicsensor"//Devicetypementionedin
ibmwatsonIOTPlatform
#defineDEVICE_ID"distancedetection"//DeviceIDmentionedinibmwatson
IOT Platform
#defineTOKEN "AlGMGaaF01nawa1QA3"      //Token
String data3;
floatdist;


//--------Customisetheabovevalues--------
charserver[]=ORG".messaging.internetofthings.ibmcloud.com";//
Server Name
charpublishTopic[]="iot-2/evt/Data/fmt/json";//topicnameand type
of event perform and format in which data to be send
charsubscribetopic[]="iot-2/cmd/test/fmt/String";//
cmdREPRESENTcommandtypeANDCOMMANDISTESTOFFORMATSTRING
charauthMethod[]="use-token-auth";//authenticationmethod char
token[] = TOKEN;
charclientId[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;//client id


//
WiFiClientwifiClient;//creatingtheinstanceforwificlient
```

```
PubSubClientclient(server,1883,callback,wifiClient);
//callingthepredefinedclientidbypassingparameterlike server
id,portandwificredential

int LED = 4;
int trig = 5;
intecho=18;
void setup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED,OUTPUT);
delay(10);
wificonnect();
mqttconnect();
}
voidloop()//RecursiveFunction
{

 digitalWrite(trig,LOW);
  digitalWrite(trig,HIGH);
  delayMicroseconds(10);
  digitalWrite(trig,LOW);
  floatdur=pulseIn(echo,HIGH); float
  dist= (dur * 0.0343)/2;
  Serial.print("Distanceincm");
  Serial.println(dist);


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



/*.....................................retrievingto
Cloud. ............................. */

void PublishData(float dist) {
  mqttconnect();//functioncallforconnectingtoibm
  /*
     creatingtheStringininformJSontoupdatethedatato ibm cloud
  */
  Stringobject;
```

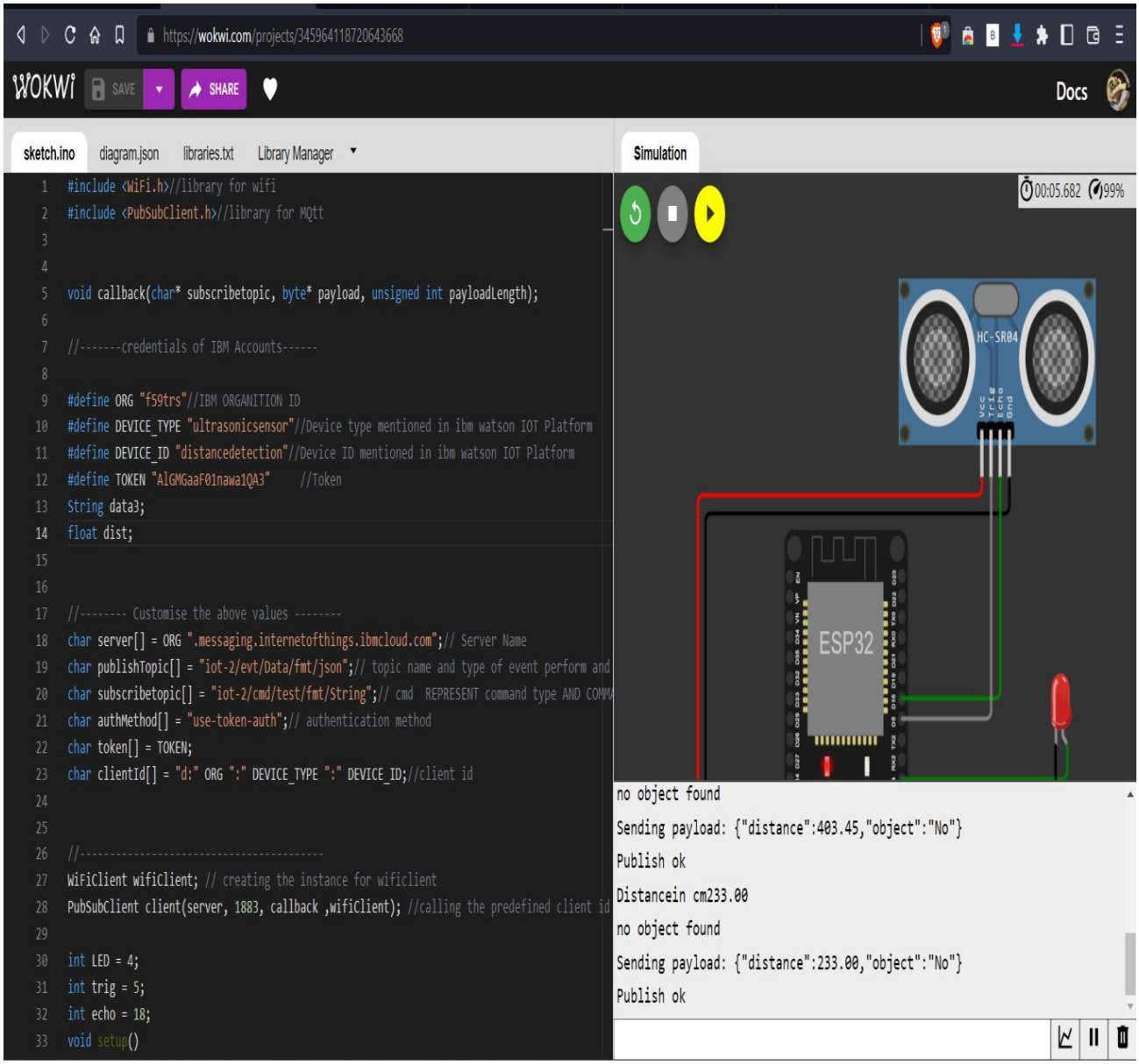
```
  if(dist<100)
  {
    digitalWrite(LED,HIGH);
    Serial.println("objectisnear");
    object = "Near";
  }
  else
  {
    digitalWrite(LED,LOW);
    Serial.println("noobjectfound"); object
    = "No";
  }

  Stringpayload="{\"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");//ifitsucessfullyuploaddata on the
cloud then it will print publish ok in Serial monitor or else it
will print publish failed
  }else{
    Serial.println("Publishfailed");
  }

}
voidmqttconnect(){
  if (!client.connected()) {
    Serial.print("Reconnectingclientto");
    Serial.println(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);//passingthewificredentials to
establish the connection
  while(WiFi.status()!=WL_CONNECTED){
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFiconnected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}

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

voidcallback(char*subscribetopic,byte*payload,unsignedint
payloadLength)
{

  Serial.print("callbackinvokedfortopic:");
  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);
```

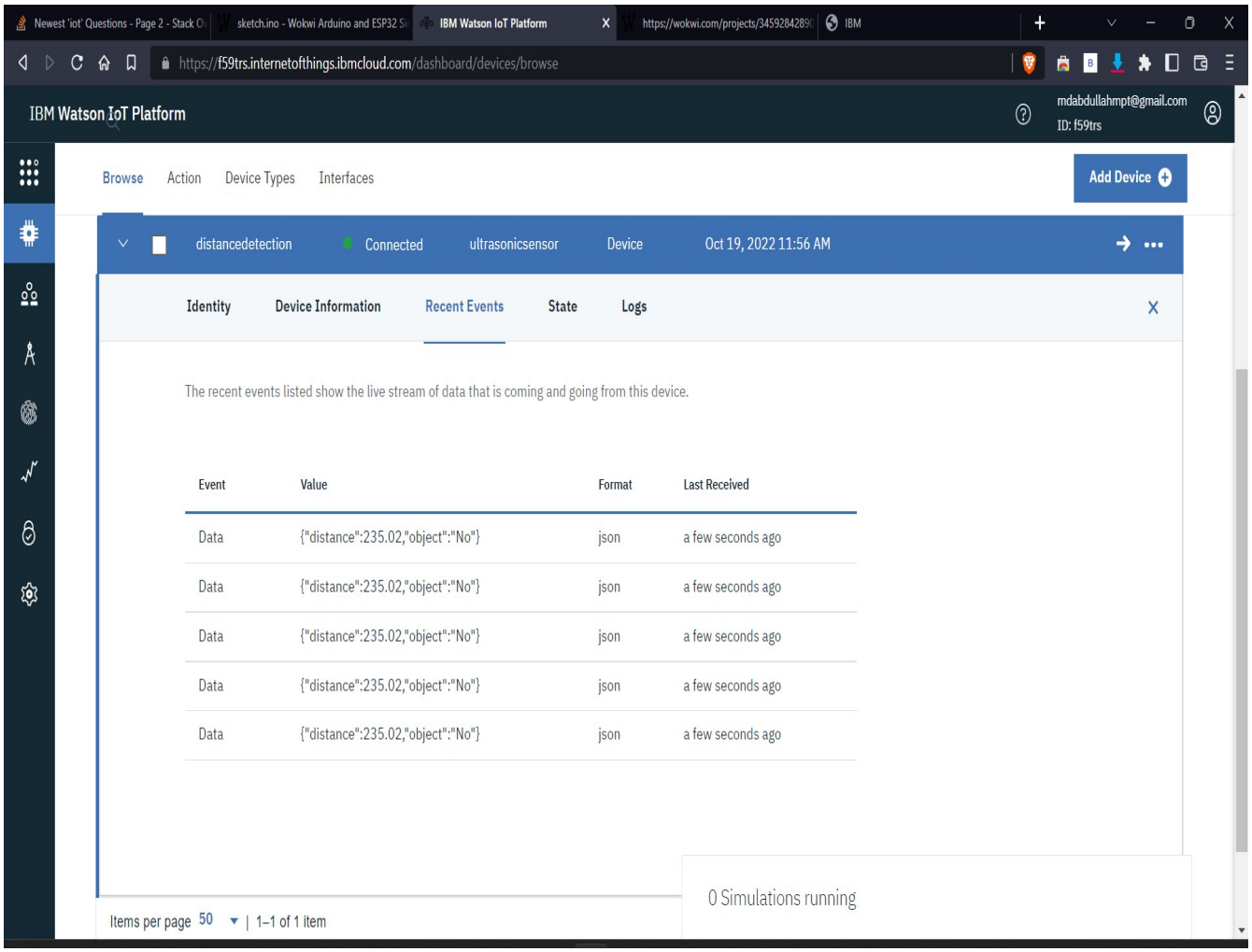
```
//digitalWrite(LED,LOW);

//    }
data3="";


}
```

OUTPUT:

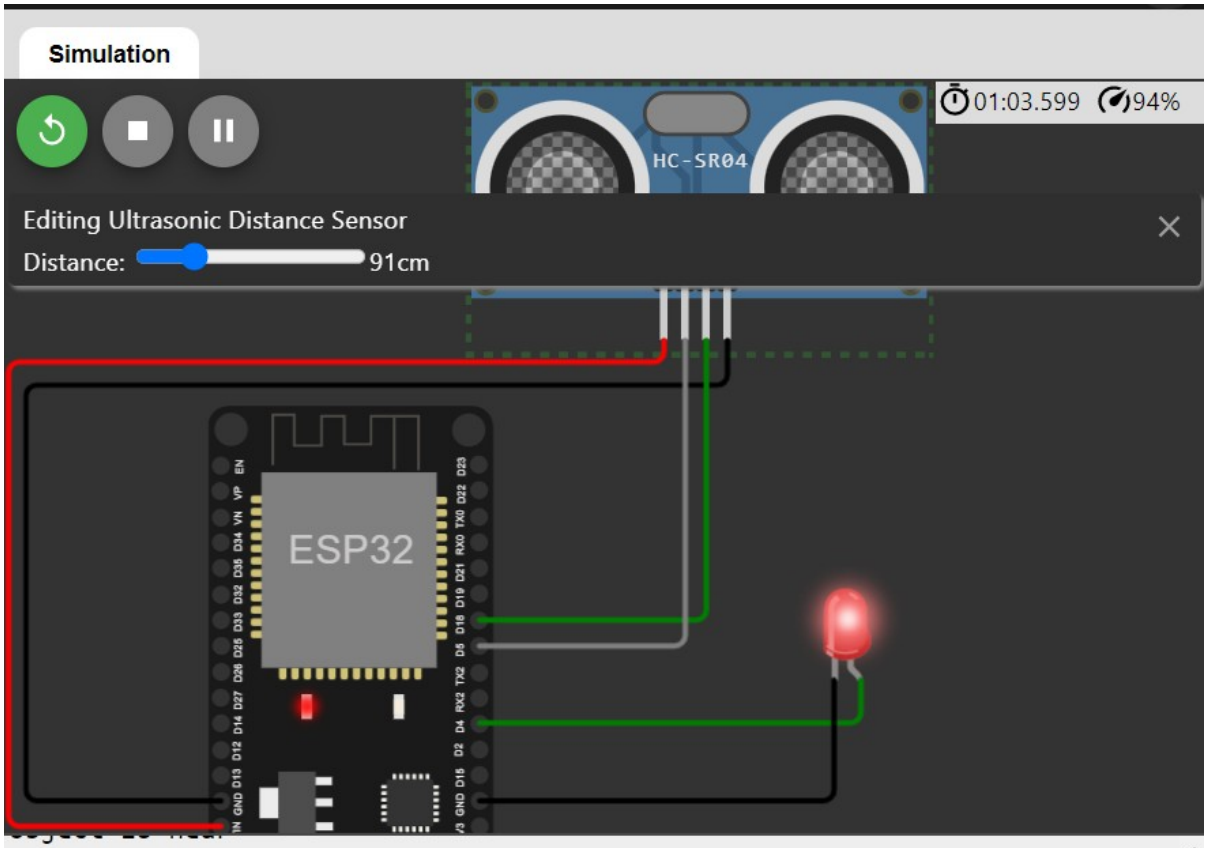
Whenobjectisnotneartotheultrasonic sensor



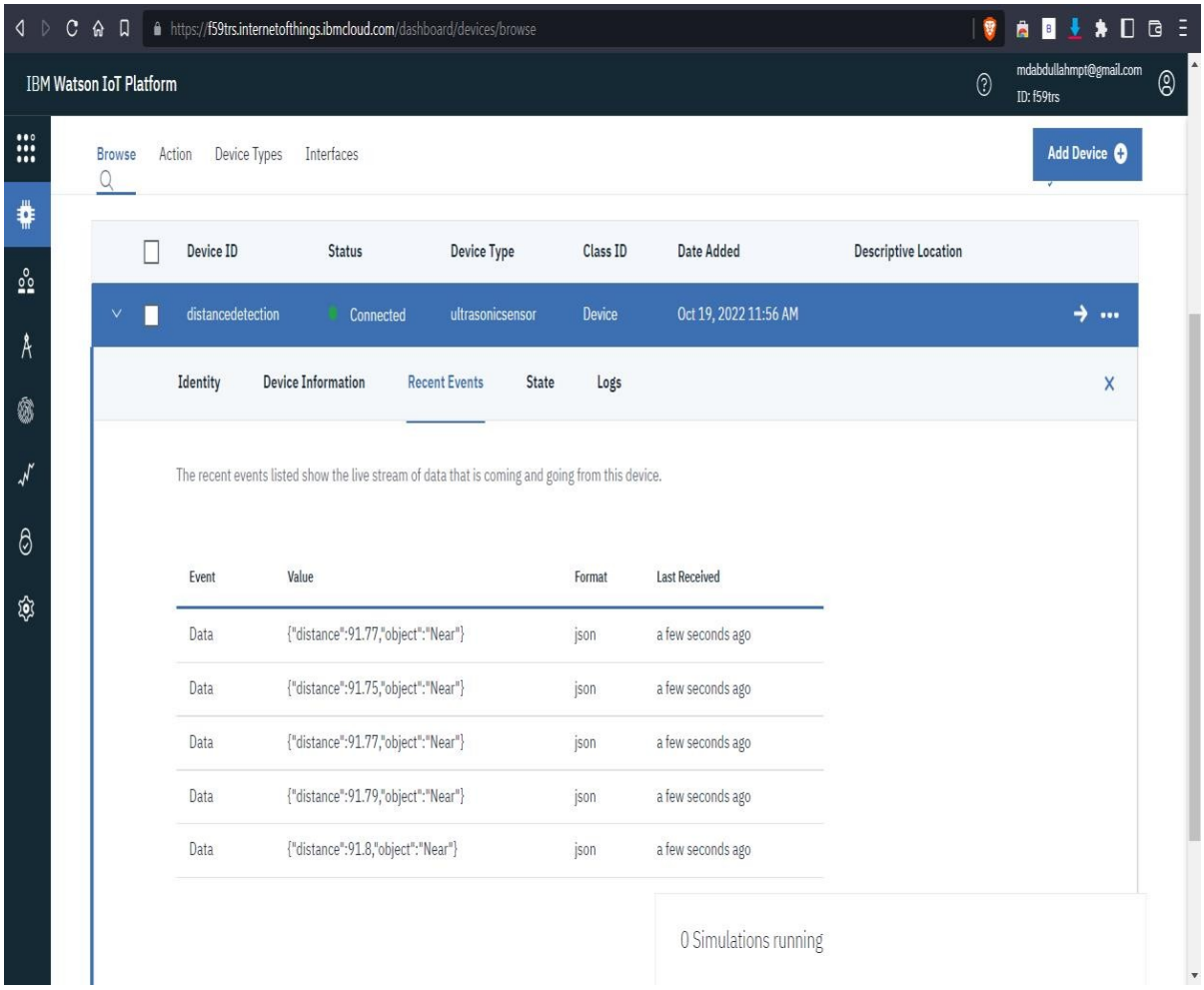
DatasenttotheIBMclouddevicewhentheobjectisfar



Whenobjectisnearertotheultrasonicsensor



DatasenttotheIBMclouddevicewhentheobjectisnear



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