Assignment -4

Distance Detection Using Ultrasonic Sensor

Assignment Date	25 October 2022
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Maximum Marks	2 Marks

Question-1:

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.

WOKWI LINK: https://wokwi.com/projects/346502216516895315

CODE:

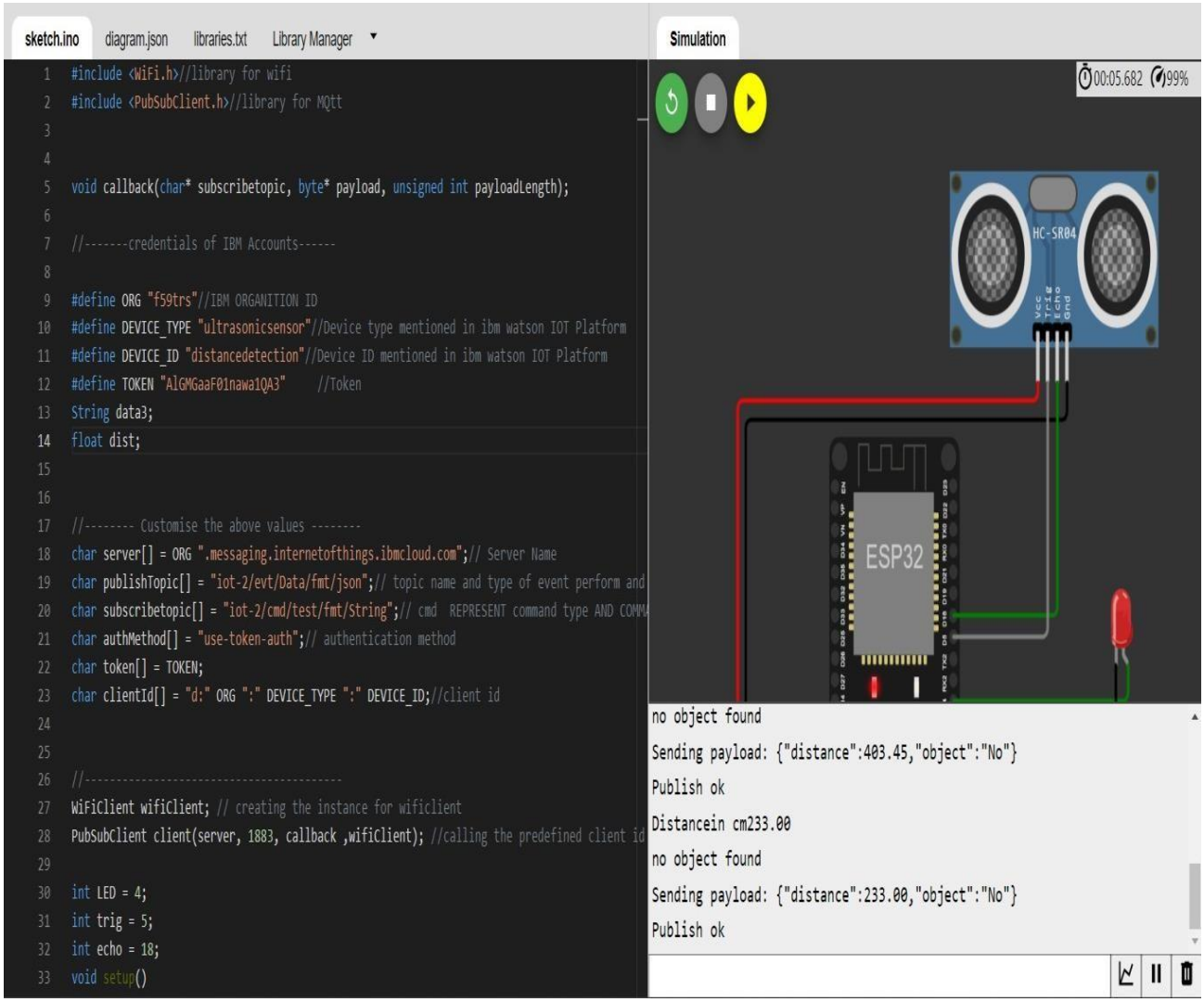
```
#include <WiFi.h>//library for wifi #include
<PubSubClient.h>//library for MQtt


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

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

#define ORG "f59trs"//IBM ORGANITION ID
#define DEVICE_TYPE "ultrasonicsensor"//Device type mentioned inibm watson IOT
Platform
#define DEVICE_ID "distancedetection"//Device ID mentioned in ibmwatson IOT
Platform
#define TOKEN "AlGMGaaF01nawa1QA3"            //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 andtype 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 methodchar token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//clientid


//                                                                -
WiFiClient wifiClient; // creating the instance for wificlient
```

```
  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();
  }
}
  String object;
```

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

// }
data3="";


}
```

```
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];
  }

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

//          }

//          else
//          {
// Serial.println(data3);
```

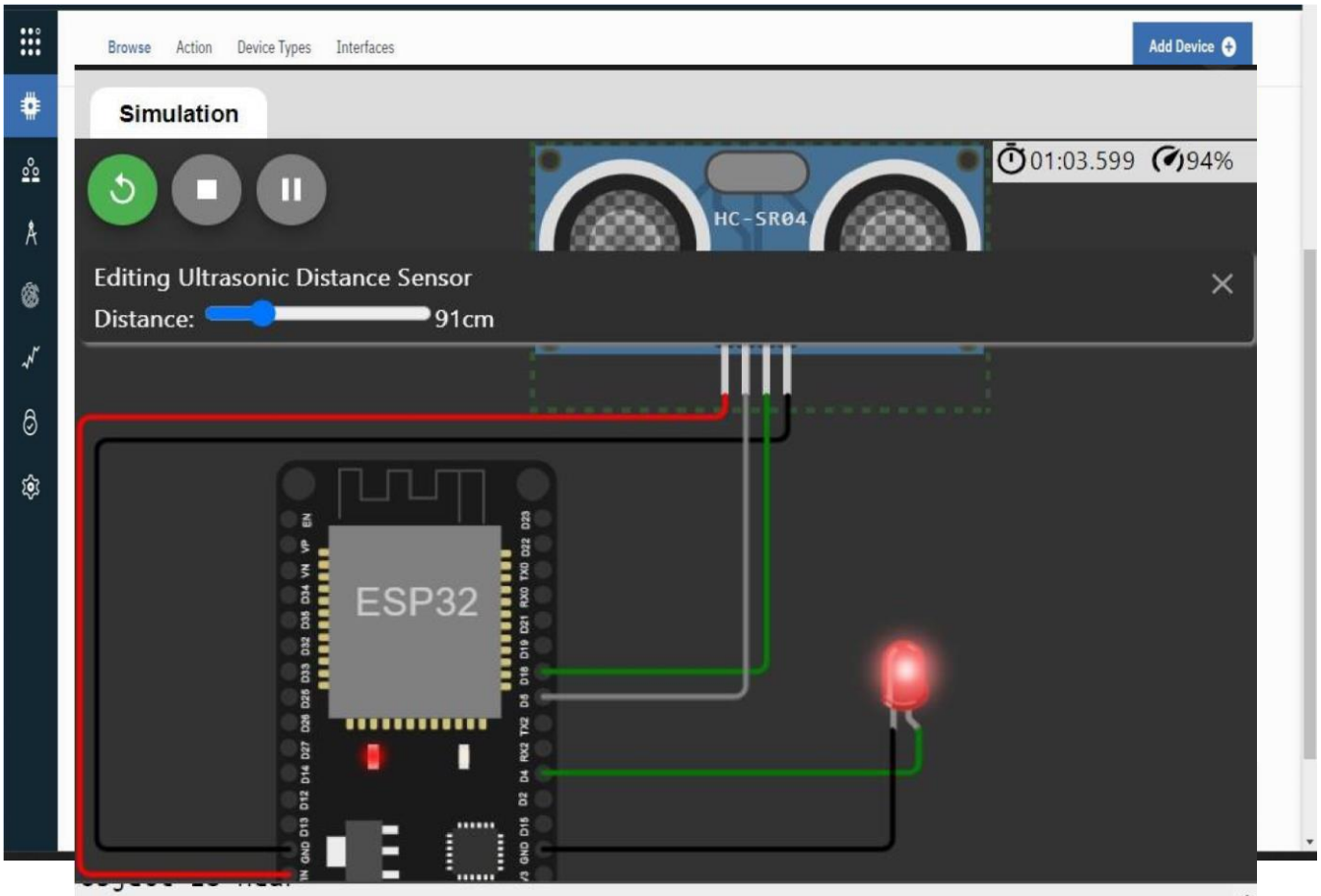
OUTPUT: When object is not near to the ultrasonic



sensor

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

When object is nearer to the ultrasonic sensor Data sent




```
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
```

to the IBM cloud device when the object is near