Assignment -4

Assignment Date	31 Oct 2022
Student Name	D.VIJAYARAJ
Student Roll Number	2127190701127
Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud

Program:

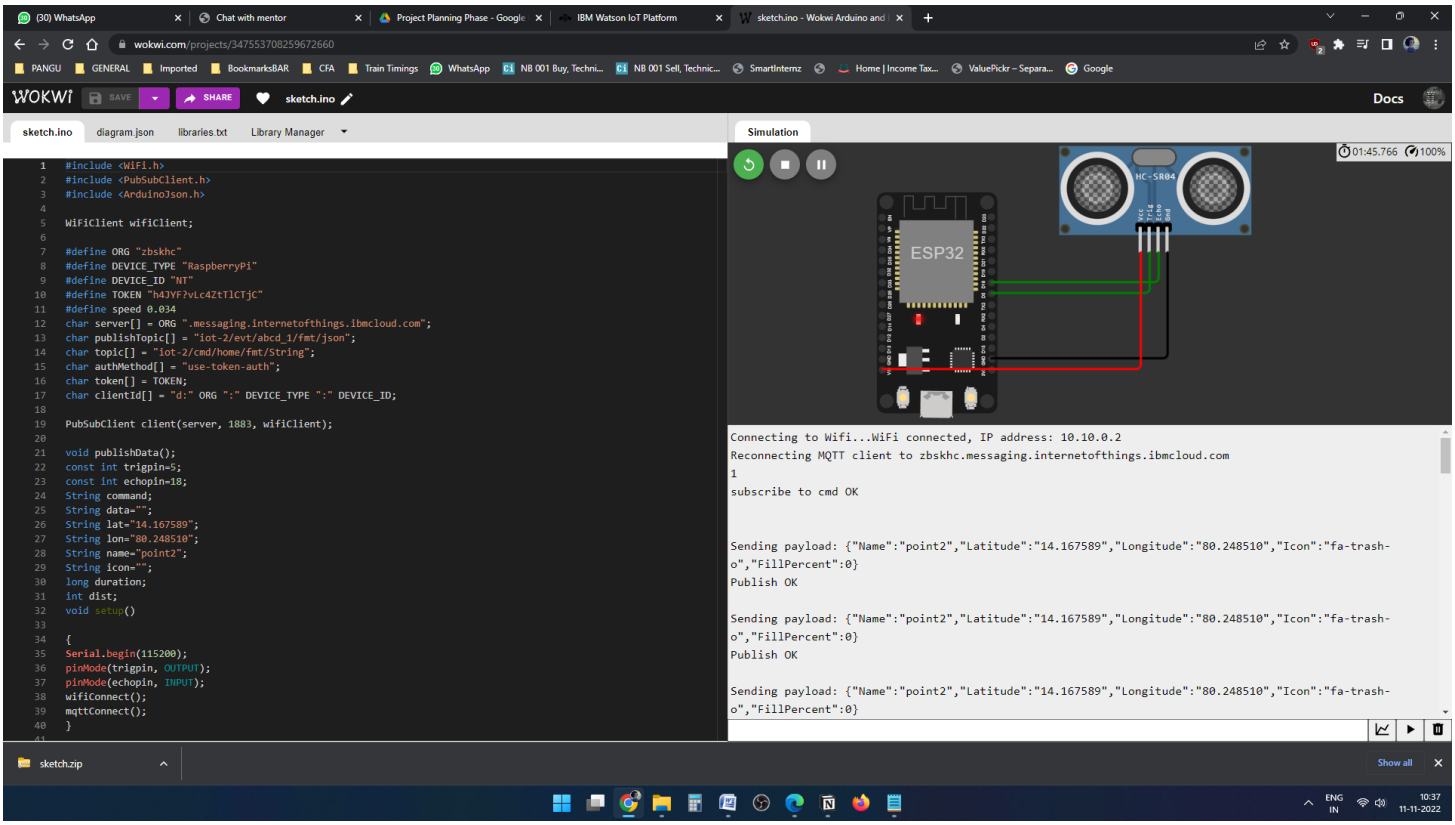
```
#include <WiFi.h>
#include <PubSubClient.h>
#include <ArduinoJson.h>

WiFiClient wifiClient;

#define ORG "zbskhc"
#define DEVICE_TYPE "RaspberryPi"
#define DEVICE_ID "NT"
#define TOKEN "h4JYF?vLc4ZtTlCTjC"
#define speed 0.034
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/abcd_1/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

PubSubClient client(server, 1883, wifiClient);

void publishData();
const int trigpin=5;
const int echopin=18;
String command;
String data="";
String lat="14.167589";
String lon="80.248510";
String name="point2";
String icon="";
long duration;
int dist;
void setup()

{
Serial.begin(115200);
pinMode(trigpin, OUTPUT);
pinMode(echopin, INPUT);
wifiConnect();
mqttConnect();
}

void loop() {
publishData();
```

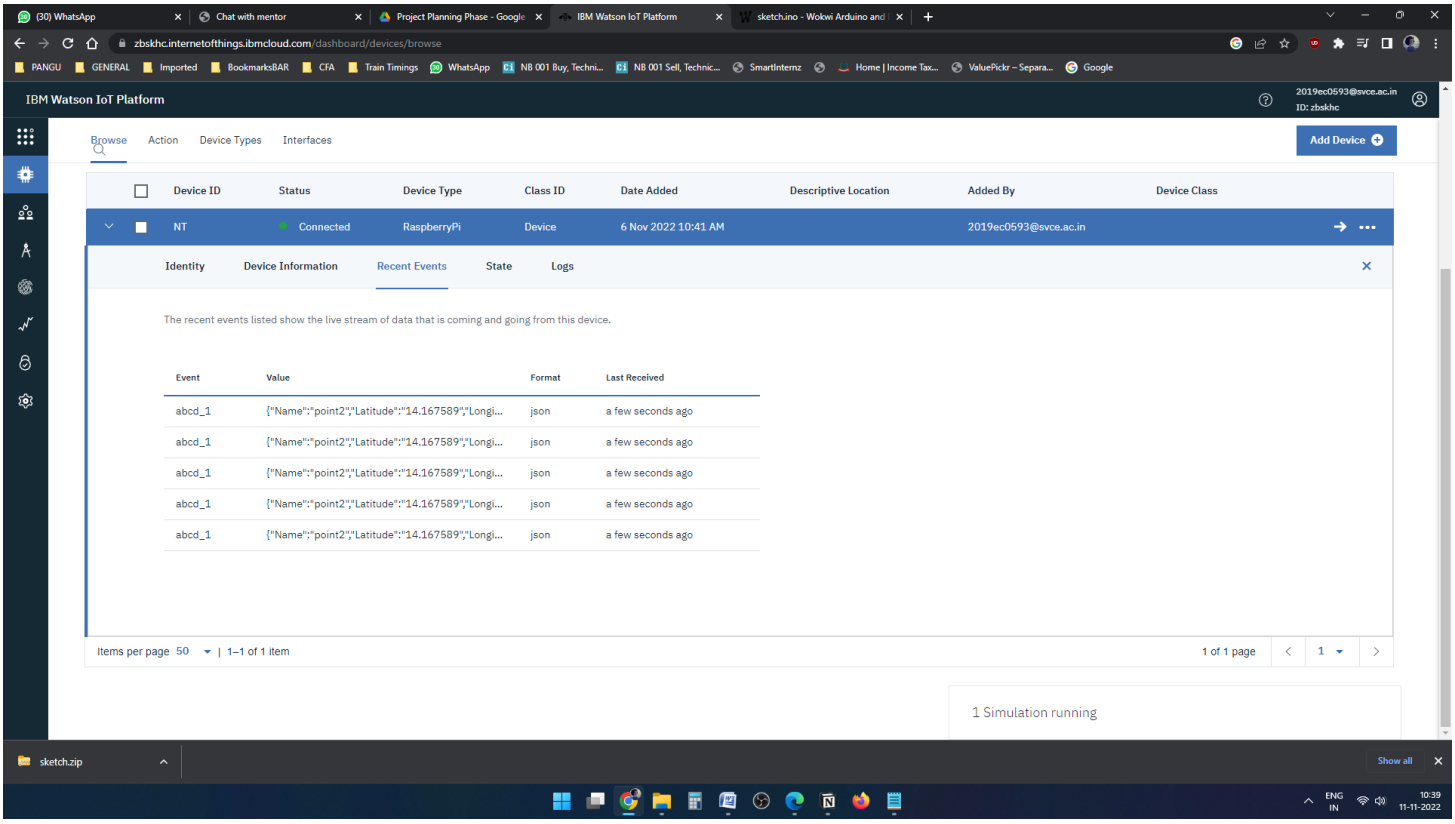
```
delay(500);
if (!client.loop()) {
mqttConnect();
}
}

void wifiConnect() {
Serial.print("Connecting to "); Serial.print("Wifi");
WiFi.begin("Wokwi-GUEST", "", 6);
while (WiFi.status() != WL_CONNECTED) {
delay(500);
Serial.print(".");
}
Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
}

 /*while (!client.connected()) { Serial.println("Connecting to MQTT...");
  if (client.connect("ESP32Client", mqttUser, mqttPassword ))
   { Serial.println("connected " + String(client.state())); client.subscribe(topic, "XXXX"); }
   else { Serial.print("failed with state ");
   Serial.print(client.state());
   delay(2000); }
*/
void mqttConnect() {
if (!client.connected()) {
Serial.print("Reconnecting MQTT client to "); Serial.println(server);
while (!client.connect(clientId, authMethod, token)) {
Serial.print(".");
delay(500);
}
initManagedDevice();
Serial.println();
}
}

void initManagedDevice() {
if (client.subscribe(topic)) {
Serial.println(client.subscribe(topic));
Serial.println("subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}

void publishData()
{
digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH);
delayMicroseconds(10);
digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<100){
dist=100-dist;
icon="fa-trash";
}else{
dist=0;
icon="fa-trash-o";
}
```

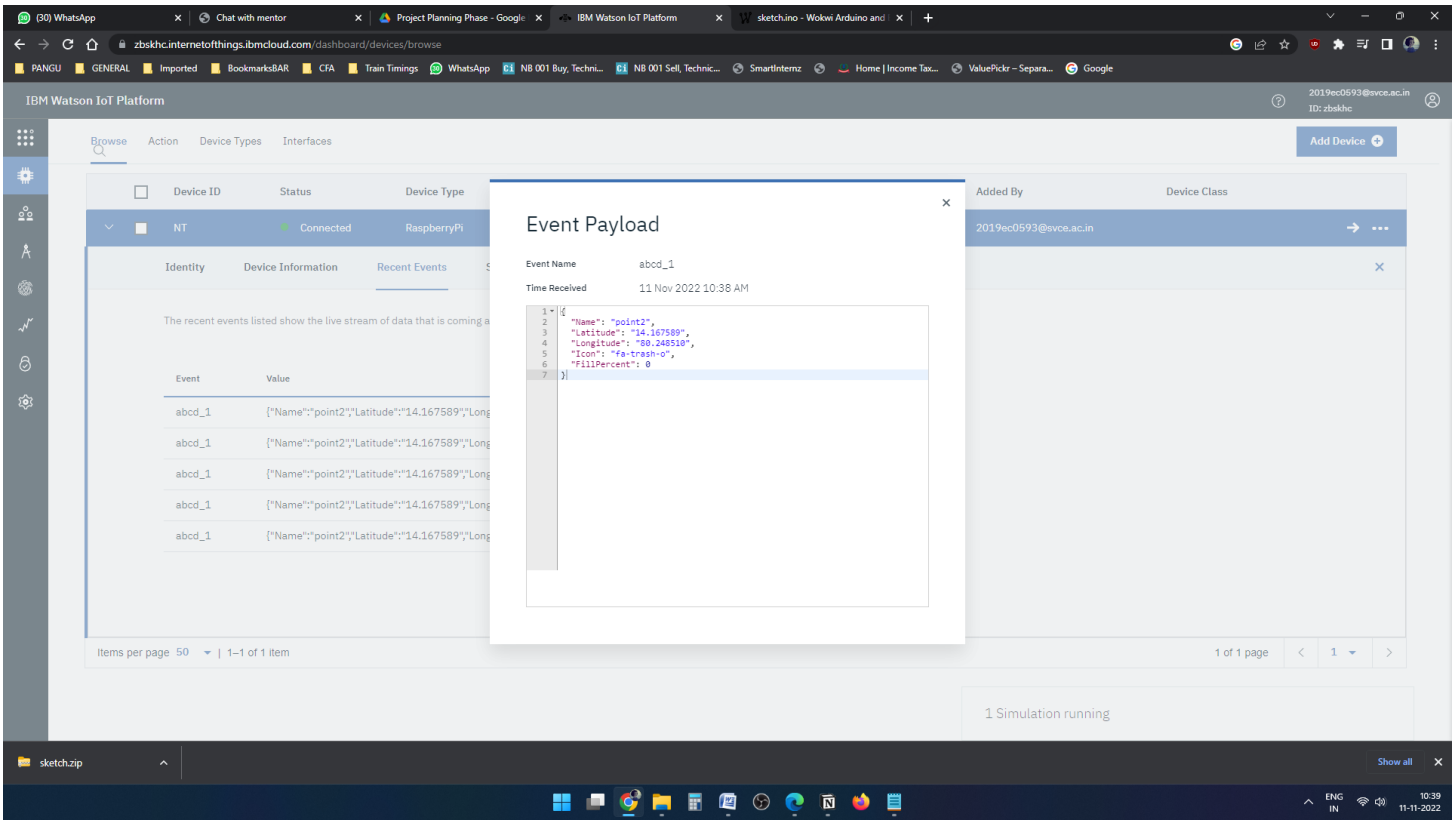
```
DynamicJsonDocument doc(1024);
String payload;
doc["Name"]=name;
doc["Latitude"]=lat;
doc["Longitude"]=lon;
doc["Icon"]=icon;
doc["FillPercent"]=dist;
serializeJson(doc, payload);
delay(3000);
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish OK");
} else {
Serial.println("Publish FAILED");
}
}
```

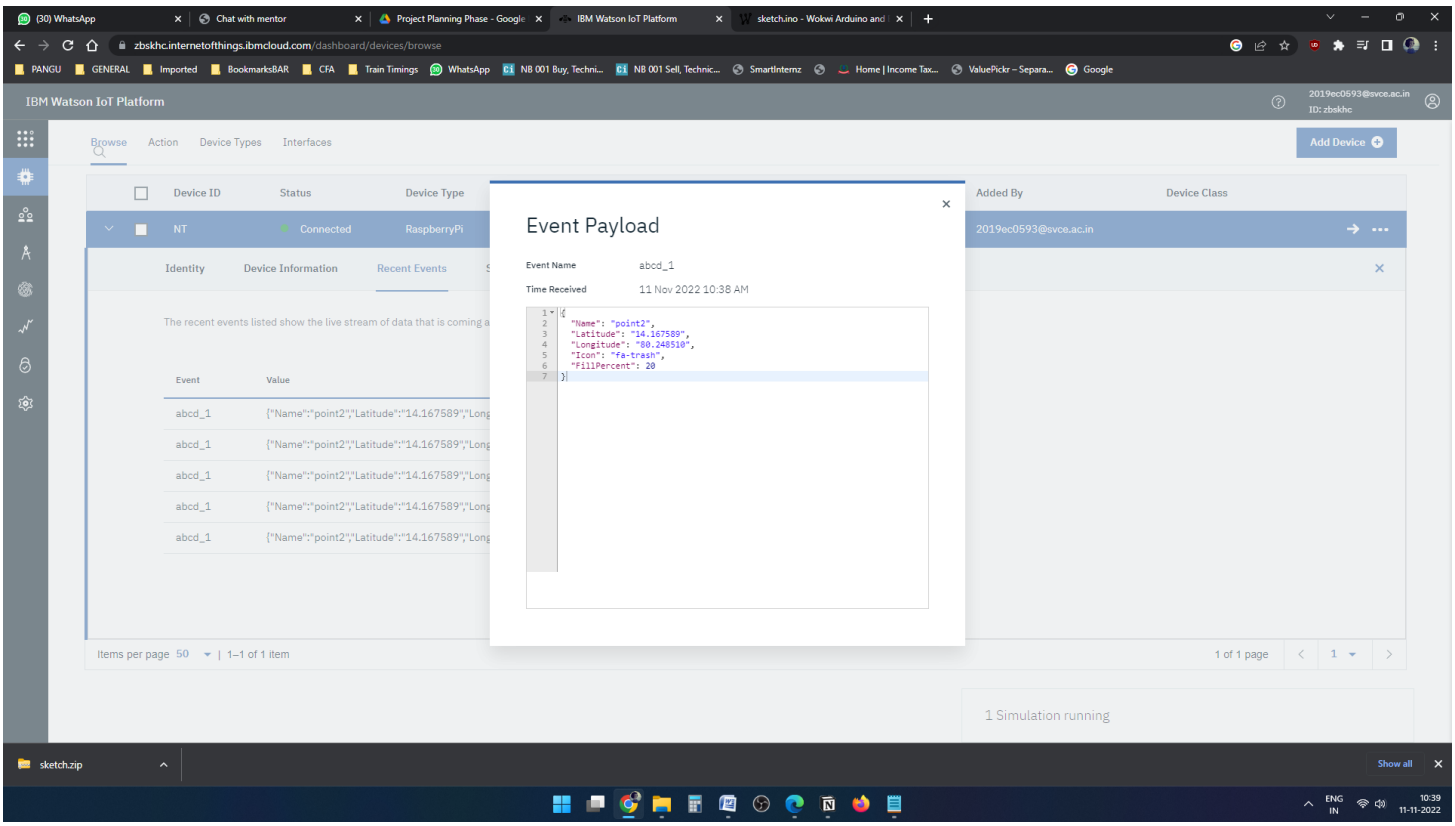
Wokwi Share link:- “https://wokwi.com/projects/347553708259672660”

Output:


WOKWI
SAVE
SHARE
sketch.ino
Docs
sketch.ino
diagram.json
libraries.txt
Library Manager
Simulation
ESP32
HC-SR04
Connecting to Wifi...WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to zbskhc.messaging.internetofthings.ibmcloud.com
1
subscribe to cmd OK
Sending payload: {"Name":"point2","Latitude":"14.167589","Longitude":"80.248510","Icon":"fa-trash-o","FillPercent":0}
Publish OK
Sending payload: {"Name":"point2","Latitude":"14.167589","Longitude":"80.248510","Icon":"fa-trash-o","FillPercent":0}
Publish OK
Sending payload: {"Name":"point2","Latitude":"14.167589","Longitude":"80.248510","Icon":"fa-trash-o","FillPercent":0}


IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Added By
Device Class
NT
Connected
RaspberryPi
Device
6 Nov 2022 10:41 AM
2019ec0593@svce.ac.in
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
abcd_1
{"Name":"point2","Latitude":"14.167589","Longi...
json
a few seconds ago
Items per page 50
1–1 of 1 item
1 of 1 page
1 Simulation running


IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Device ID
Status
Device Type
Added By
Device Class
NT
Connected
RaspberryPi
2019ec0593@svce.ac.in
Identity
Device Information
Recent Events
Event
Value
abcd_1
Event Payload
Event Name
abcd_1
Time Received
11 Nov 2022 10:38 AM
{
"Name": "point2",
"Latitude": "14.167589",
"Longitude": "80.248510",
"Icon": "fa-trash-o",
"FillPercent": 0
}
Items per page 50
1–1 of 1 item
1 of 1 page
1 Simulation running
sketch.zip
Show all


IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Device ID
Status
Device Type
Added By
Device Class
NT
Connected
RaspberryPi
2019ec0593@svce.ac.in
Identity
Device Information
Recent Events
Event
Value
abcd_1
Event Payload
Event Name
abcd_1
Time Received
11 Nov 2022 10:38 AM
{
"Name": "point2",
"Latitude": "14.167589",
"Longitude": "80.248510",
"Icon": "fa-trash",
"FillPercent": 20
}
Items per page 50
1–1 of 1 item
1 of 1 page
1 Simulation running
sketch.zip
Show all