Assignment Date	22 October2022
Student Name	Swathi R
Student Roll Number	2019504053
Maximum Marks	2 Marks

ASSIGNMENT-4

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.

Source Code:

```
 #include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic,byte* payload, unsigned int payloadLength);
#define ORG "w1e0ay"
#define DEVICE_TYPE "nodeMCU"
#define DEVICE_ID "1004"
#define TOKEN "95245848"
String data3;
char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/distance/fmt/json";
char subscribeTopic[]="iot-2/cmd/test/fmt/String";
char authMethod[]="use-token-auth";
char token[]=TOKEN;
char clientID[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server,1883,callback,wifiClient);
#define ECHO_PIN 12
#define TRIG_PIN 13
#define led 14
void setup() {
// put your setup code here, to run once:
Serial.begin(115200);
pinMode(led, OUTPUT);
pinMode(TRIG_PIN, OUTPUT);
pinMode(ECHO_PIN, INPUT);
wificonnect();
mqttconnect();
}
float readDistanceCM() {
digitalWrite(TRIG_PIN, LOW);// Clear the trigger
delayMicroseconds(2);
digitalWrite(TRIG_PIN,  HIGH);//  Sets  the  trigger  pin  to  HIGH  state  for  10
microseconds
delayMicroseconds(10);
```

```
digitalWrite(TRIG_PIN, LOW);
int duration=pulseIn(ECHO_PIN, HIGH);
//Serial.println(duration);
//duration = pulseIn(ECHO_PIN, HIGH);
return duration*0.017;
//Serial.println(duration);
}
void loop() {
float distance = readDistanceCM();
//Serial.println(distance);
bool isNearby = distance < 100;
digitalWrite(led, isNearby);
Serial.print("Measured distance: ");
Serial.println(distance);
if(distance<100){
PublishData2(distance);
}else{
PublishData1(distance);
}
//PublishData(distance);
delay(1000);
if(!client.loop()){
mqttconnect();
}
//delay(2000);
}
void PublishData1(float dist){
mqttconnect();
String payload= "{\"distance\":";
payload += dist;
payload+="}";
Serial.print("Sending payload:");
Serial.println(payload);
if(client.publish(publishTopic,(char*)payload.c_str())){
Serial.println("publish ok");
} else{
Serial.println("publish failed");
}
}
void PublishData2(float dist){
mqttconnect();
String payload= "{\"ALERT\":";
payload += dist;
payload+="}";
Serial.print("Sending payload:");
Serial.println(payload);
if(client.publish(publishTopic,(char*)payload.c_str())){
Serial.println("publish ok");
} else{
Serial.println("publish failed");
}
}
```

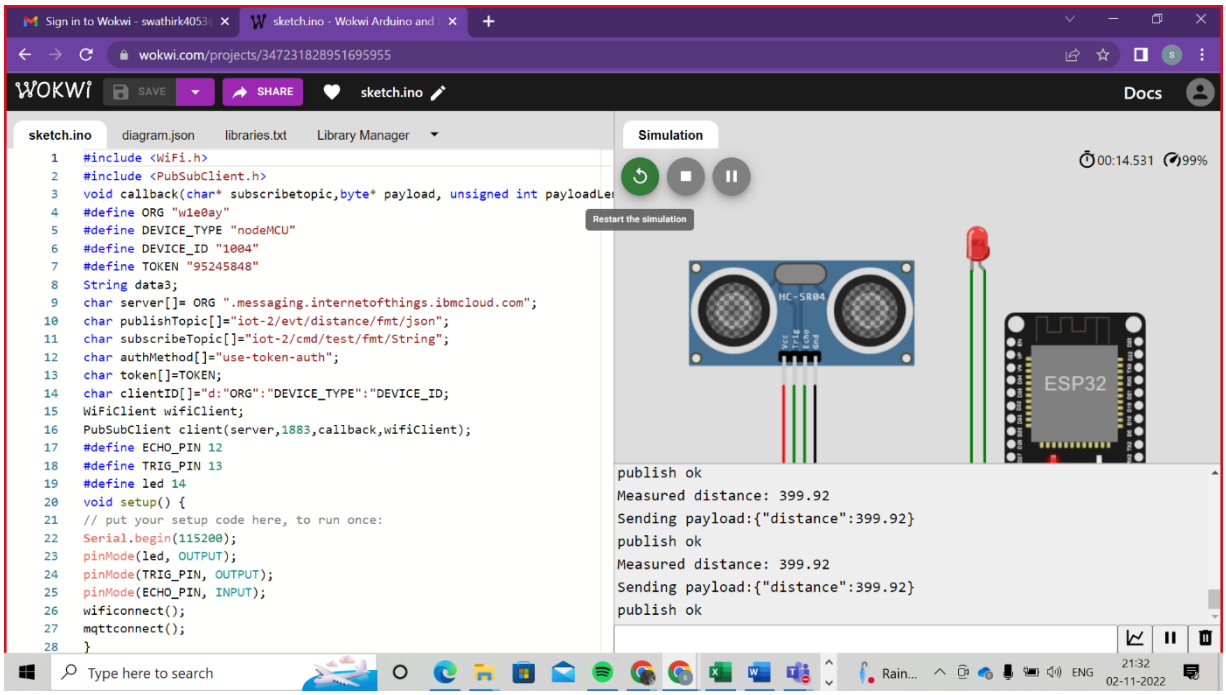
```
void mqttconnect(){
if(!client.connected()){
Serial.print("Reconnecting to ");
Serial.println(server);
while(!!!client.connect(clientID, authMethod, token)){
Serial.print(".");
delay(500);
}
initManagedDevice();
Serial.println();
}
}
void wificonnect(){
Serial.println();
Serial.print("Connecting to");
WiFi.begin("Wokwi-GUEST","",6);
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++){
data3 += (char)payload[i];}
Serial.println("data:"+ data3);
if(data3=="lighton"){
Serial.println(data3);
digitalWrite(led,HIGH);
}else{
Serial.println(data3);
digitalWrite(led,LOW);}
data3="";
}
```

WOKWI LINK:

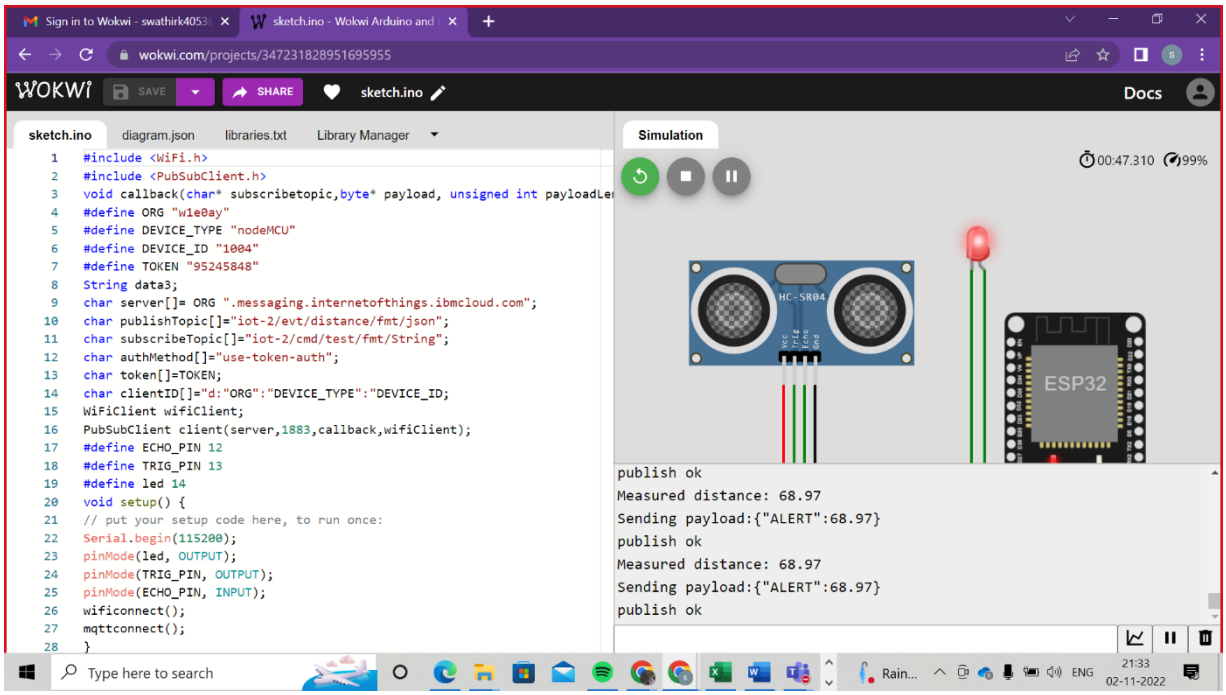
https://wokwi.com/projects/347231828951695955

OUTPUT:

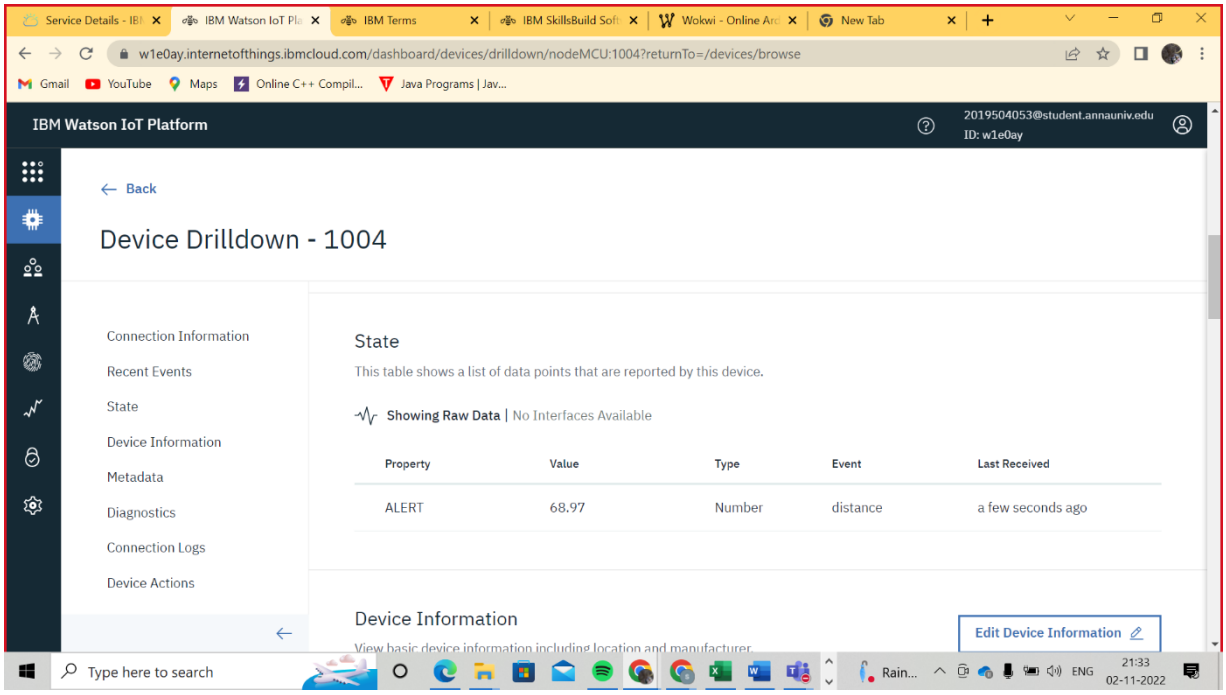
NORMAL CASE:

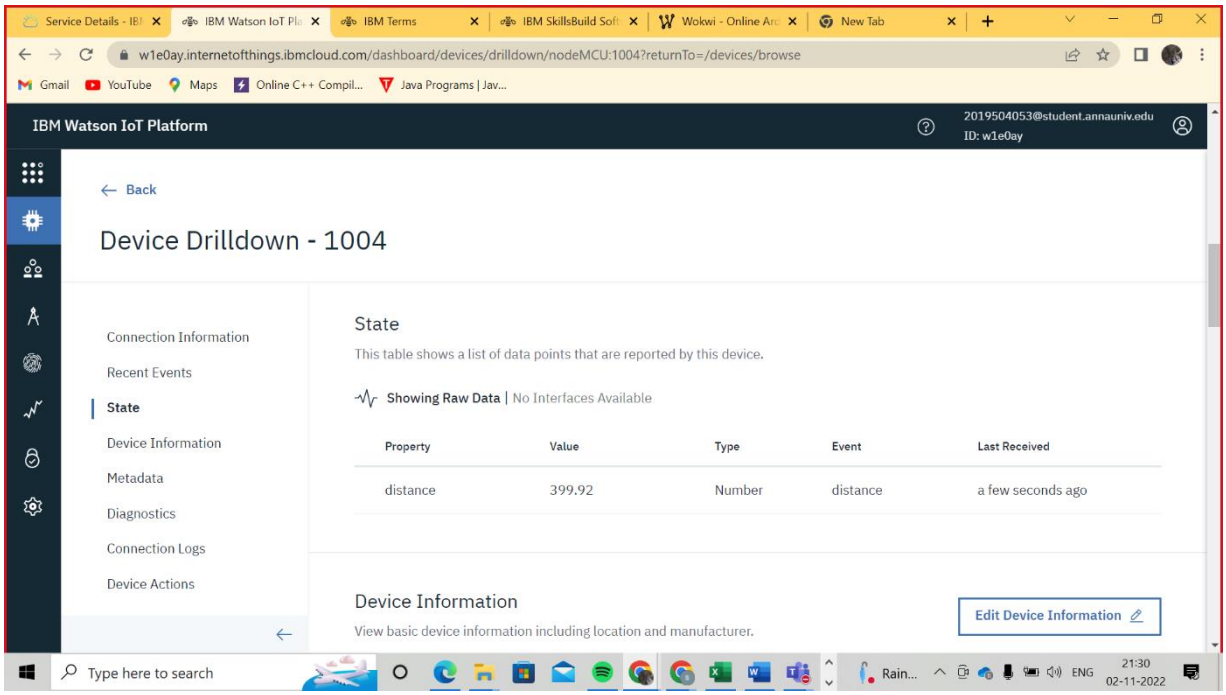


ALERT CASE:



IBM CLOUD STORAGE:




Service Details - IBI
IBM Watson IoT Pla
IBM Terms
IBM SkillsBuild Soft
Wokwi - Online Arc
New Tab
w1e0ay.internetofthings.ibmcloud.com/dashboard/devices/drilldown/nodeMCU:1004?returnTo=/devices/browse
Gmail
YouTube
Maps
Online C++ Compil...
Java Programs | Jav...
IBM Watson IoT Platform
2019504053@student.annauniv.edu
ID: w1e0ay
Back
Device Drilldown - 1004
Connection Information
Recent Events
State
Device Information
Metadata
Diagnostics
Connection Logs
Device Actions
State
This table shows a list of data points that are reported by this device.
Showing Raw Data | No Interfaces Available
Property
Value
Type
Event
Last Received
distance
399.92
Number
distance
a few seconds ago
Device Information
View basic device information including location and manufacturer.
Edit Device Information
Type here to search
Rain...
ENG
21:30
02-11-2022