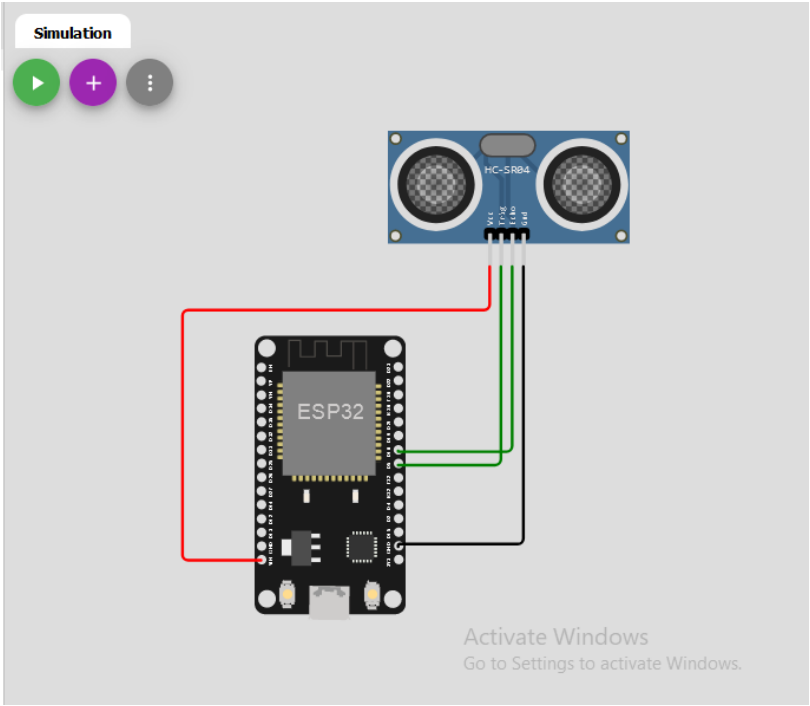
ASSIGNMENT – 4

Qn. Write code and connections in wokwi for the Ultrasonic Sensor. Whenever the distance is less than 100cms, send an alert to ibm cloud and display in the device recent events.

Circuit Diagram:



Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "t5y3in"
#define DEVICE_TYPE "UltrasonicSensor"
#define DEVICE_ID "12345"
#define TOKEN "dnf*JvI-?(Ud3wbkpv"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Beautlin J D/fmt/json";
char topic[] = "iot-2/cmd/led/fmt/String";
char authMethod[] = "use-token-auth";
```

```
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);

const int trigpin=5;
const int echopin=18;
String command;
String data="";

long duration;
float dist;

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

void loop() {
bool isNearby = dist < 100;
digitalWrite(led, isNearby);

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());
}
```

```
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("IBM 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){
String payload = "{\"Alert Distance\":";
payload += dist;
payload += "}";

Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish OK");
}

}
if(dist>100){
String payload = "{\"Distance\":";
payload += dist;
```

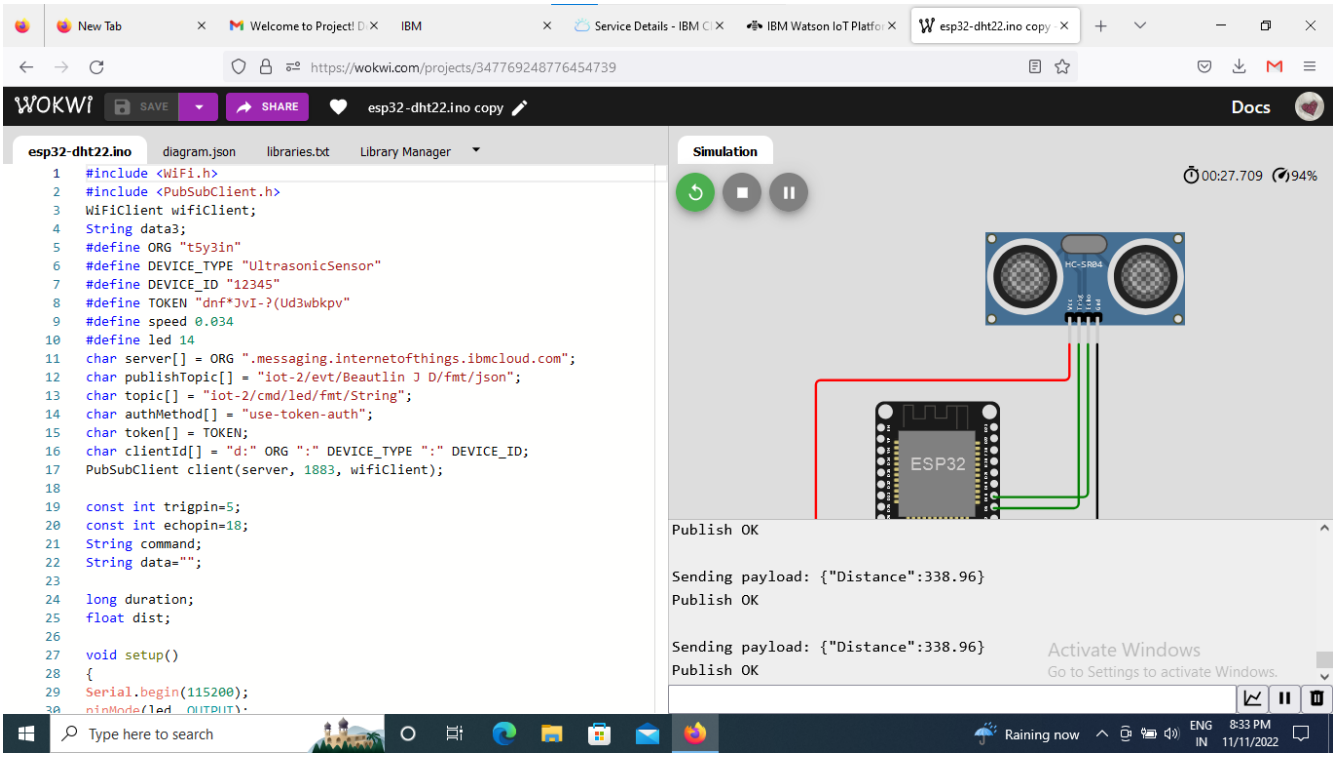
```
payload += "}";

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");
}
}
}
```

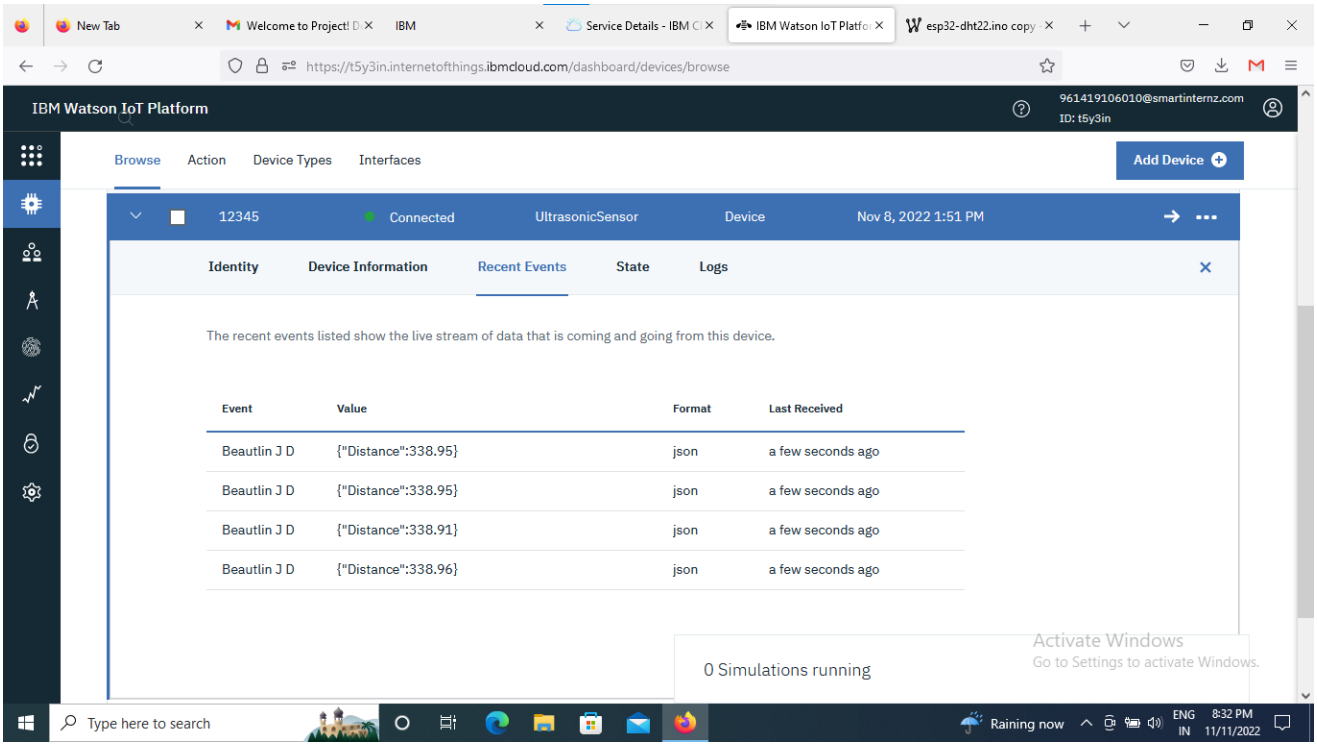
Wokwi Simulation Link:

https://wokwi.com/projects/347769248776454739

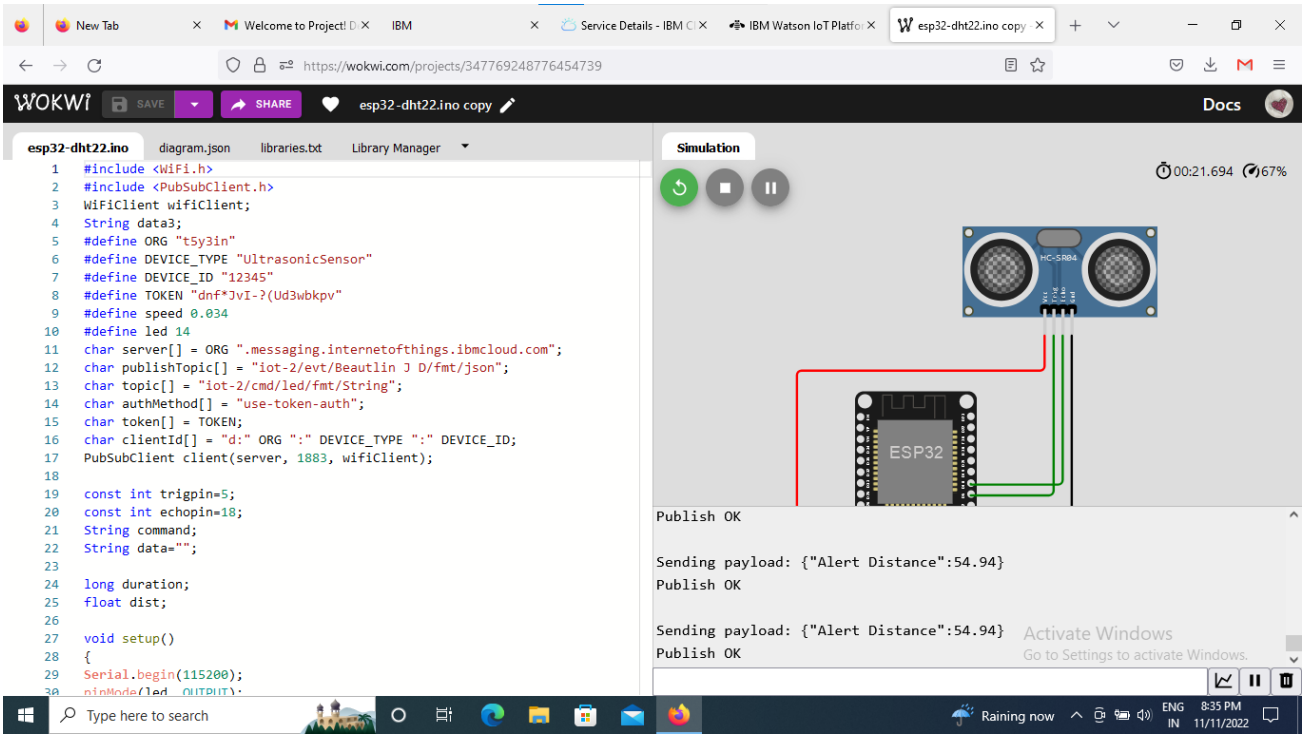
Output:

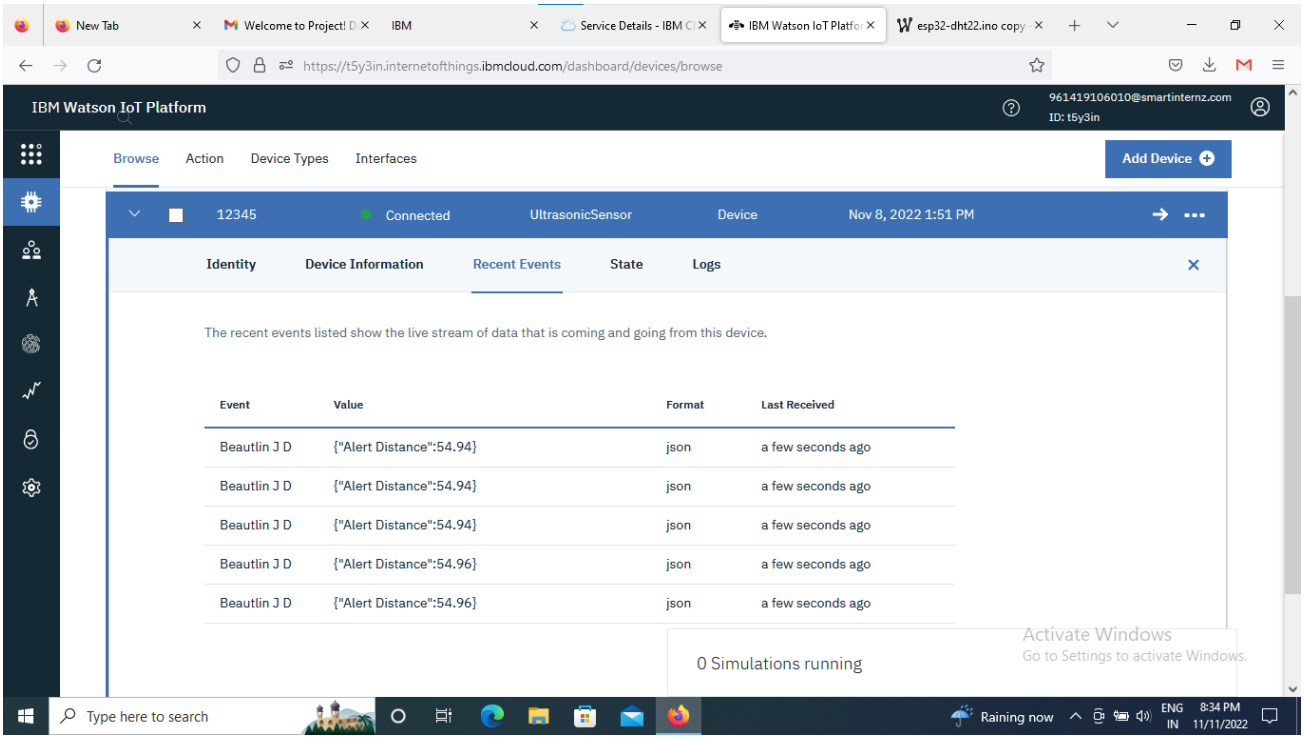
1. **When the distance is greater than 100 cms**





2. When the distance is less than 100 cms




New Tab
Welcome to Project! D
IBM
Service Details - IBM C
IBM Watson IoT Platfo
esp32-dht22.ino copy
https://t5y3in.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
961419106010@smartinternz.com
ID: t5y3in
Browse
Action
Device Types
Interfaces
Add Device
12345
Connected
UltrasonicSensor
Device
Nov 8, 2022 1:51 PM
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
Beautlin J D
{"Alert Distance":54.94}
json
a few seconds ago
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{"Alert Distance":54.94}
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0 Simulations running
Activate Windows
Go to Settings to activate Windows.
Type here to search
Raining now
ENG
IN
8:34 PM
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