Assignment-4

Date	7 November 2022
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Project Name	IoT Based Smart Crop Protection System for Agriculture

Question :

Write code and connections in wokwi for ultrasonic sensors. That whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events. Upload document with wokwi share link and images.

Wokwi:

https://wokwi.com/projects/348316955881505364

Code:

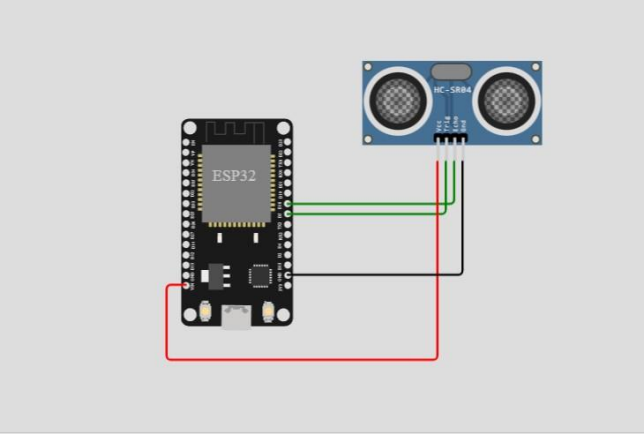
```
#include <WiFi.h>
#include <PubSubClient.h>


WiFiClient wifiClient;

#define ORG "wkmekh"
#define DEVICE_TYPE "ESP_Controller"
#define DEVICE_ID "UltraSonic_Sensor"
#define TOKEN "AVdIhflzQ49vuCn0ul"
#define speed 0.034

char server[] = ORG".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/event_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="";
long duration;
float 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()); }
void mqttConnect() {
if (!client.connected()) {
Serial.print("Reconnecting MQTT client to ");
Serial.println(server);
while (!client.connect(clientId, authMethod, token)) {
```

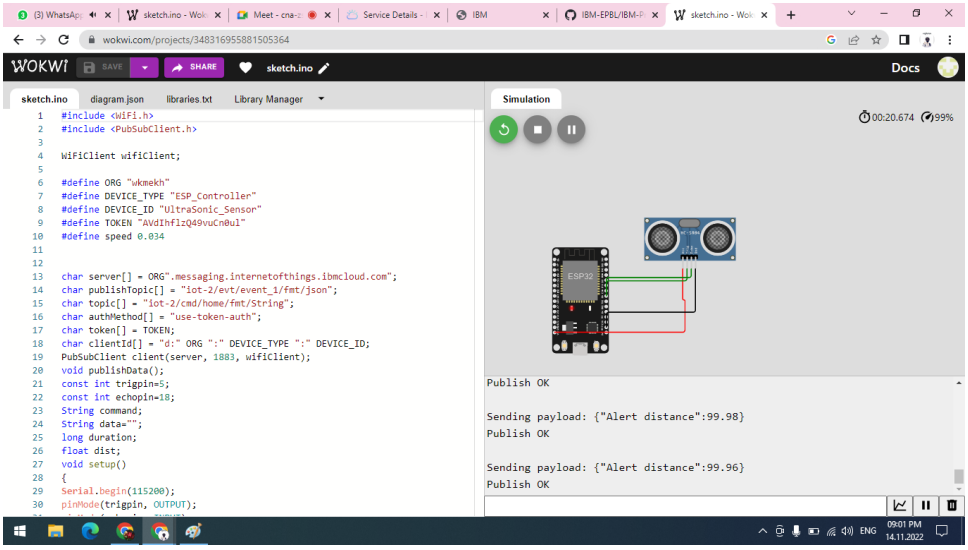
```
Serial.print(".");
delay(500);
}
initManagedDevice();
Serial.println();
}
}
void initManagedDevice() {
if (client.subscribe(topic)) {
// Serial.println(client.subscribe(topic));
Serial.println("subscribe to cmd OK");
}
else {
Serial.println("subscribe to cmd FAILED");
}
}
void publishData()
{
digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH);
delayMicroseconds(10);
digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<100){
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");
} else {
```

```
Serial.println("Publish FAILED");
}
}
}
```

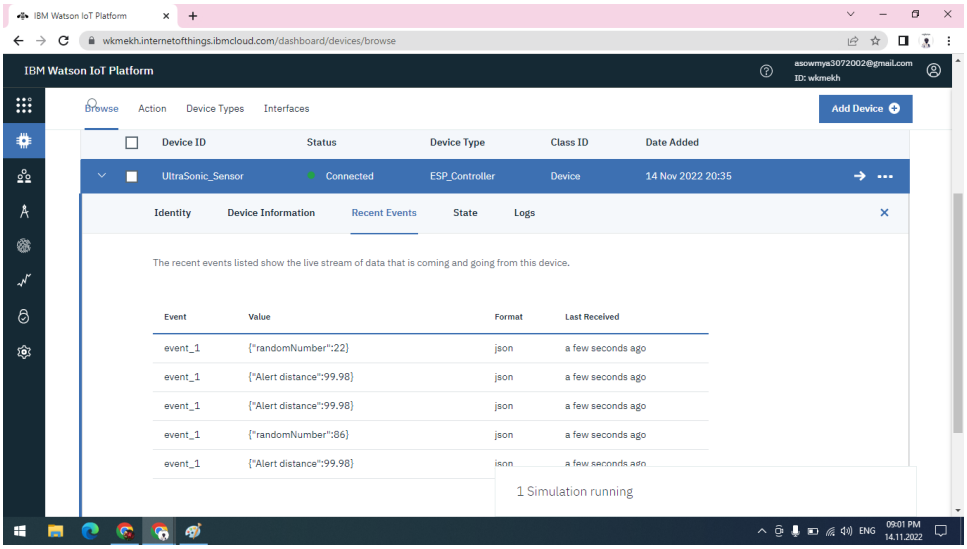
Diagram:



Wokwi Output:



IBM cloud output


IBM Watson IoT Platform
wkmekh.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
esowmya3072002@gmail.com
ID: wkmekh
Browse
Action
Device Types
Interfaces
Add Device
Device ID
Status
Device Type
Class ID
Date Added
UltraSonic_Sensor
Connected
ESP_Controller
Device
14 Nov 2022 20:35
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
event_1
{"randomNumber":22}
json
a few seconds ago
event_1
{"Alert distance":99.98}
json
a few seconds ago
event_1
{"Alert distance":99.98}
json
a few seconds ago
event_1
{"randomNumber":86}
json
a few seconds ago
event_1
{"Alert distance":99.98}
1 Simulation running
ENG
09:01 PM
14.11.2022