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Team ID	PNT2022TMID26030

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.

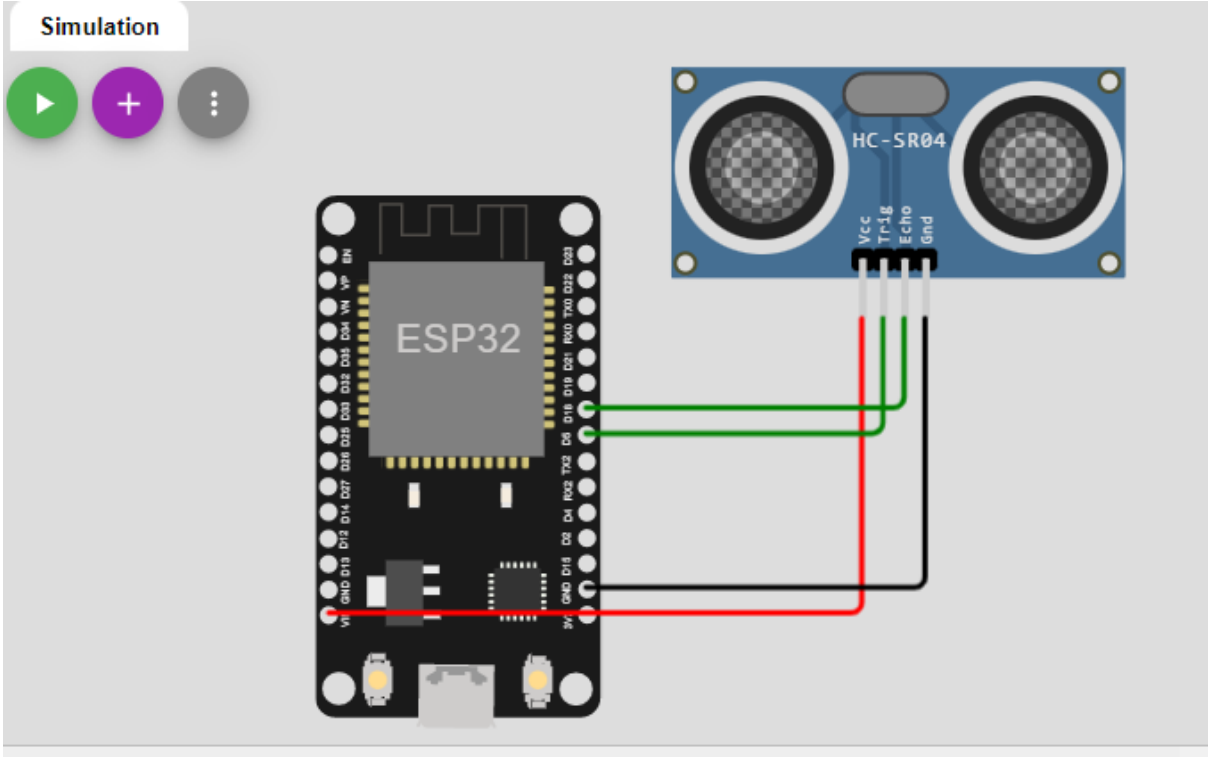
Code:

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

WiFiClient wifiClient;

#define ORG "xl1n9k"
#define DEVICE_TYPE "ESP32_Controller"
#define DEVICE_ID "BME280_Sensor"
#define TOKEN "d*5Hemuh*FTpEJUx2I"
#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="";
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());
}

void mqttConnect() {
  if (!client.connected()) {
    Serial.print("Reconnecting MQTT client to "); Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) {
      Serial.print(".");
      delay(1000);
    }
    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");
  }
}
```

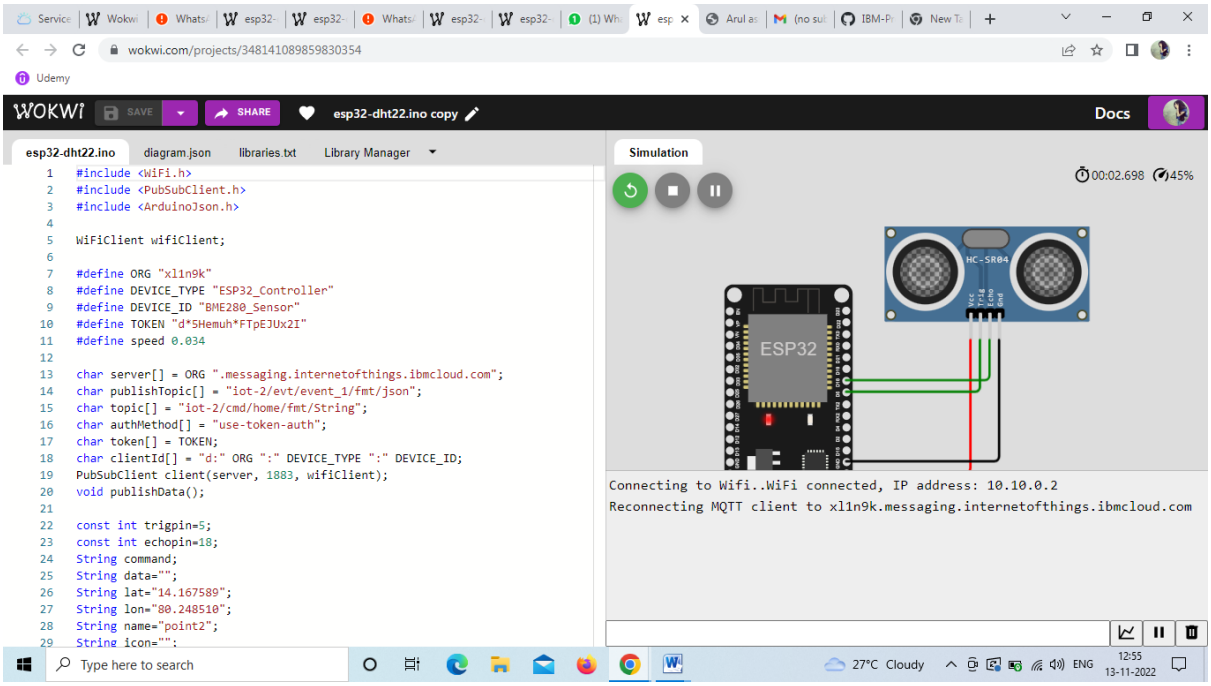
Diagram :



Wokwi link :

https://wokwi.com/projects/348141089859830354

Output :

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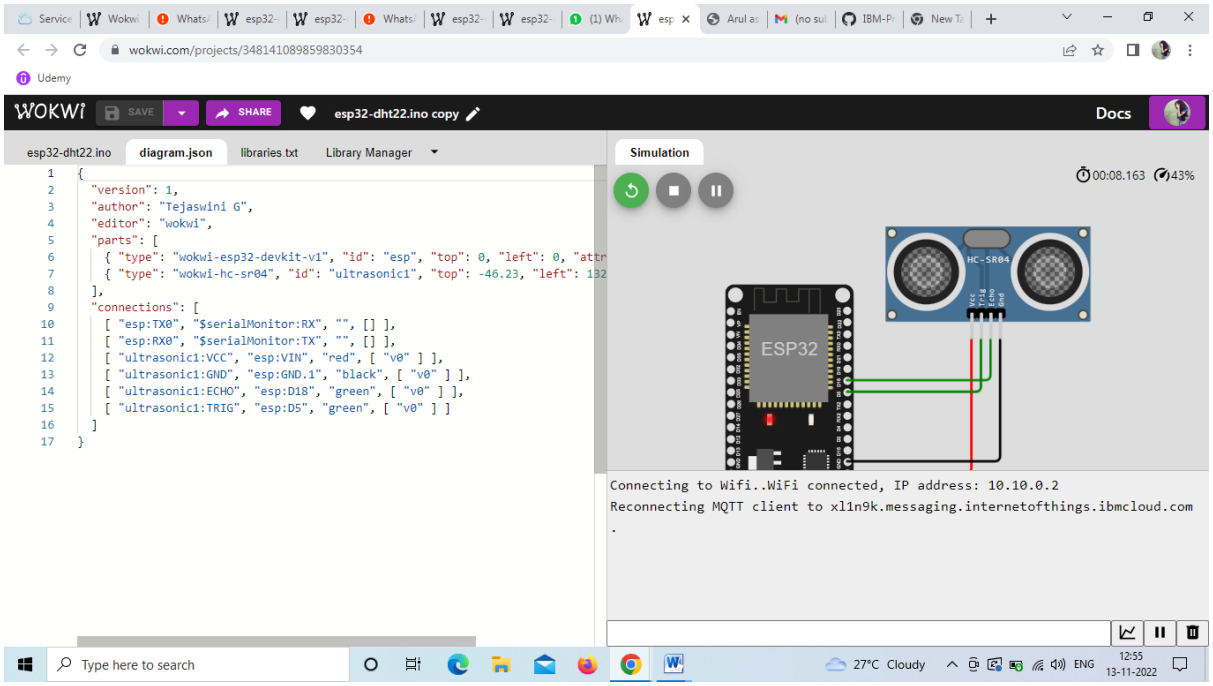
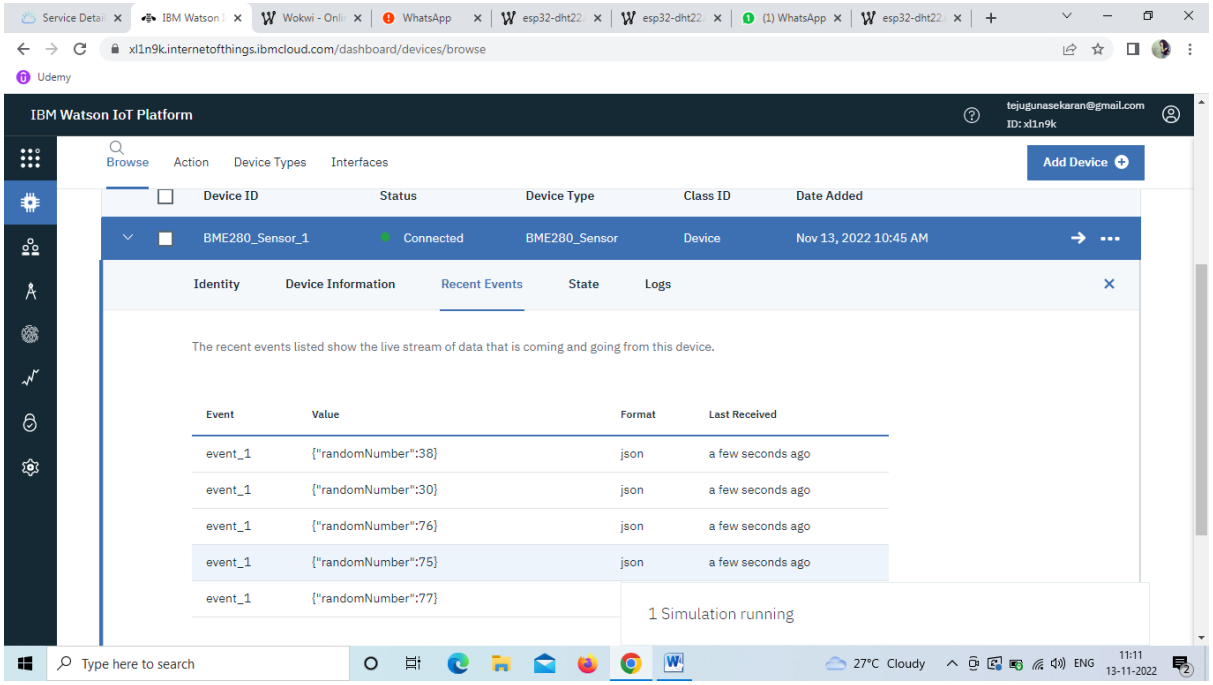

wokwi.com/projects/348141089859830354
WOKWI
SAVE
SHARE
esp32-dht22.ino copy
Docs
esp32-dht22.ino
diagram.json
libraries.txt
Library Manager
{
"version": 1,
"author": "Tejaswini G",
"editor": "wokwi",
"parts": [
{ "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": 0, "left": 0,
{ "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": -46.23, "left":
],
"connections": [
["esp:TX0", "$serialMonitor:RX", "", []],
["esp:RX0", "$serialMonitor:TX", "", []],
["ultrasonic1:VCC", "esp:VIN", "red", ["v0"]],
["ultrasonic1:GND", "esp:GND.1", "black", ["v0"]],
["ultrasonic1:ECHO", "esp:D18", "green", ["v0"]],
["ultrasonic1:TRIG", "esp:D5", "green", ["v0"]]
]
}
Simulation
00:08.163
43%
HC-SR04
ESP32
Connecting to Wifi..WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to xl1n9k.messaging.internetofthings.ibmcloud.com
.
Type here to search
27°C Cloudy
ENG
12:55
13-11-2022


xl1n9k.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
tejugunasekaran@gmail.com
ID: xl1n9k
Browse
Action
Device Types
Interfaces
Add Device
Device ID
Status
Device Type
Class ID
Date Added
BME280_Sensor_1
Connected
BME280_Sensor
Device
Nov 13, 2022 10:45 AM
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":38}
json
a few seconds ago
event_1
{"randomNumber":30}
json
a few seconds ago
event_1
{"randomNumber":76}
json
a few seconds ago
event_1
{"randomNumber":75}
json
a few seconds ago
event_1
{"randomNumber":77}
1 Simulation running
Type here to search
27°C Cloudy
ENG
11:11
13-11-2022