Assignment-4

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.

CODE:

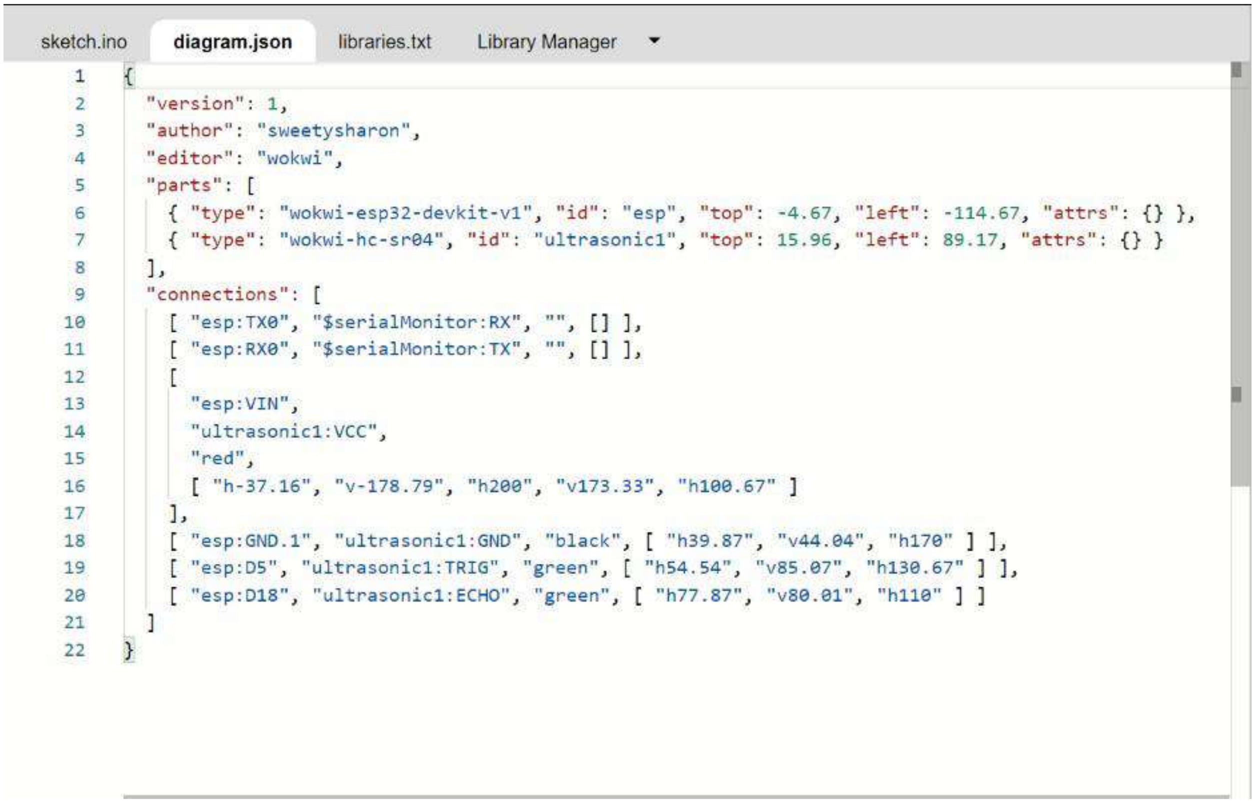
```
#include <WiFi.h>
 #include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
#define ORG "kotoq5"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm
watson IOT Platform
#define DEVICE_ID "12345
String data3;
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/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);
 const int trigPin = 5;
const int echoPin = 18;
#define SOUND_SPEED 0.034
 long duration;
float distance;
void setup() {
```

```
Serial.begin(115200); pinMode(trigPin, OUTPUT); pinMode(echoPin,
INPUT); wificonnect(); mqttconnect();
}
void loop()
{
digitalWrite(trigPin, LOW); delayMicroseconds(2); digitalWrite(trigPin,
HIGH); delayMicroseconds(10); digitalWrite(trigPin, LOW); duration =
pulseIn(echoPin, HIGH);
distance = duration * SOUND_SPEED/2;
 Serial.print("Distance (cm): ");
Serial.println(distance);
if(distance<100)
{
Serial.println("ALERT!!");
delay(1000); PublishData(distance);
delay(1000);
if (!client.loop()) { mqttconnect(); } }
delay(1000);
}
void PublishData(float dist) { mqttconnect();
String payload = "{\"Distance\":"; payload += dist;
payload += ",\"ALERT!!\":""\"Distance less than 100cms\""; 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 client 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");
}
}
```

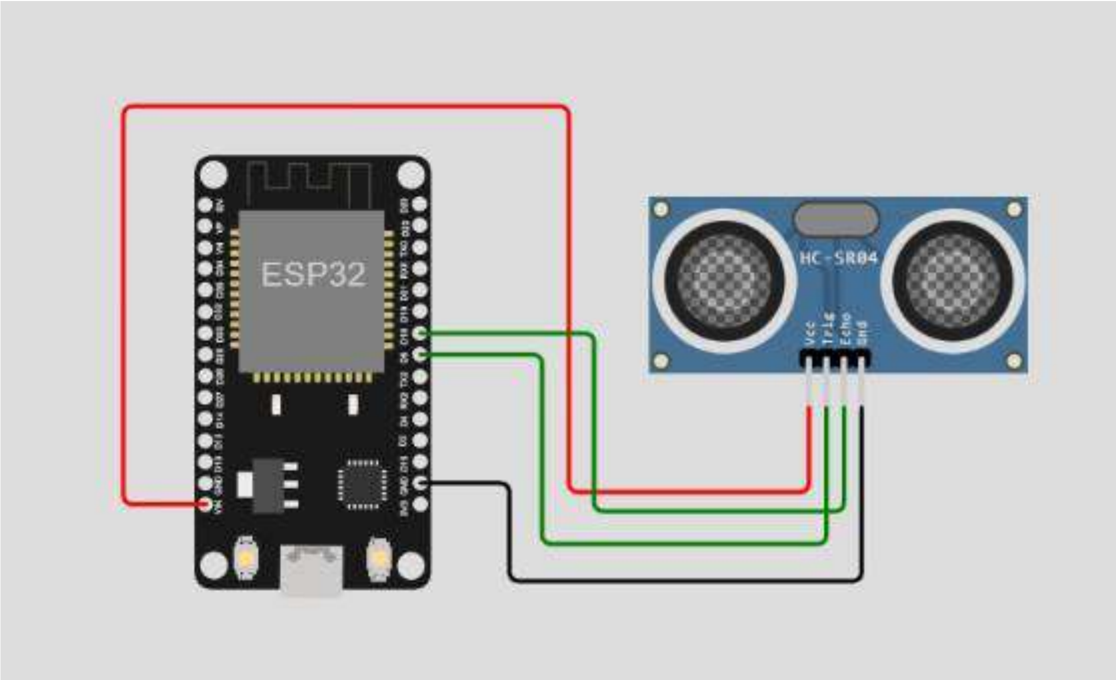
```
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength)
{
Serial.print("callback invoked for topic: ");
Serial.println(subscribetopic);
for (int i = 0; i < payloadLength; i++)
 {
//Serial.print((char)payload[i]); data3 += (char)payload[i];
}
Serial.println("data: "+ data3);

data3="";

}
```

.json CODE:



```
{
  "version": 1,
  "author": "sweetysharon",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -114.67, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left": 89.17, "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [
      "esp:VIN",
      "ultrasonic1:VCC",
      "red",
      [ "h-37.16", "v-178.79", "h200", "v173.33", "h100.67" ]
    ],
    [ "esp:GND.1", "ultrasonic1:GND", "black", [ "h39.87", "v44.04", "h170" ] ],
    [ "esp:D5", "ultrasonic1:TRIG", "green", [ "h54.54", "v85.07", "h130.67" ] ],
    [ "esp:D18", "ultrasonic1:ECHO", "green", [ "h77.87", "v80.01", "h110" ] ]
  ]
}
```

Circuit Diagram:


ESP32
HC-SR04
Vcc
Trig
Echo
Gnd