ASSIGNMENT-4

Assignment Date	15 October2022
Student Name	
Student Roll Number	7155191060
Team ID	PNT2022TMID43384
Project Name	Smart Farmer - IoT Enabled Smart Farming Application
Maximum marks	2 marks

Question: 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

PROGRAM:

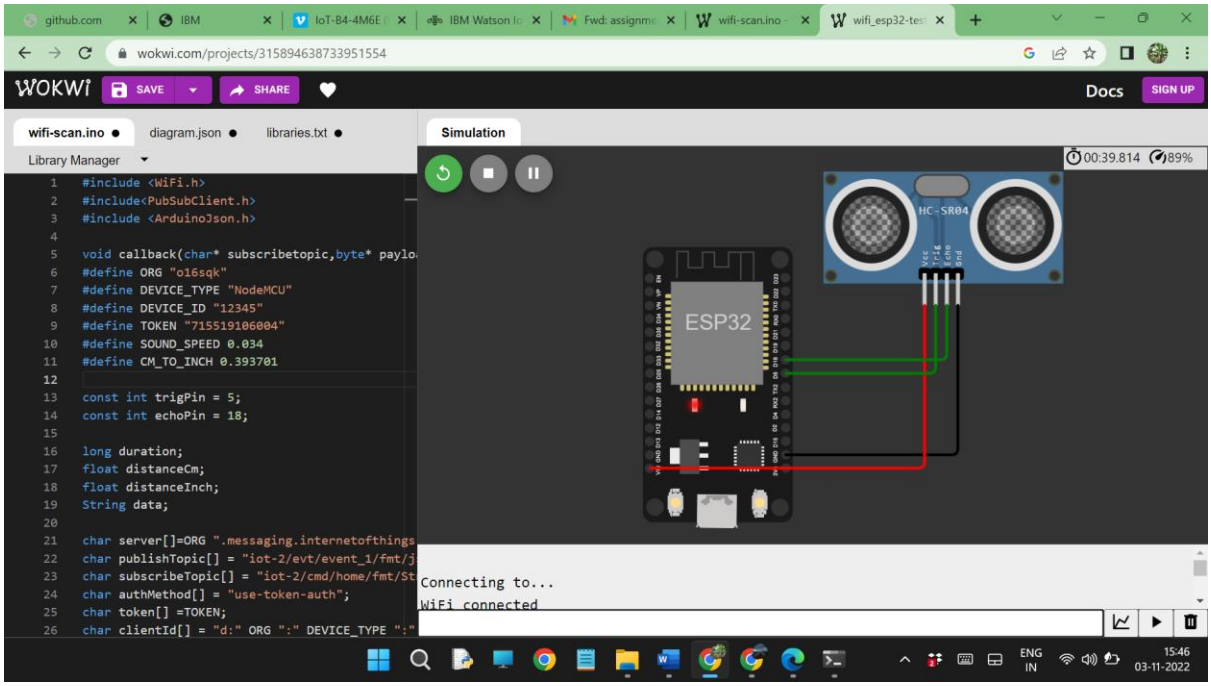
```
#include <WiFi.h>
#include<PubSubClient.h>
#include <ArduinoJson.h>

void callback(char* subscribetopic,byte* payload,unsigned int payloadLength);
#define ORG "o16sqk"
#define DEVICE_TYPE "NodeMCU"
#define DEVICE_ID "12345"
#define TOKEN "715519106004"
#define SOUND_SPEED 0.034
#define CM_TO_INCH 0.393701

const int trigPin = 5;
const int echoPin = 18;

long duration;
float distanceCm;
float distanceInch;
String data;

char server[]=ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/event_1/fmt/json";
char subscribeTopic[] = "iot-2/cmd/home/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);

void setup() {
  Serial.begin(115200); // Starts the serial communication
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input
  wificonnect();
```

```
  mqttconnect();
}

void loop() {
  // Clears the trigPin
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  // Sets the trigPin on HIGH state for 10 micro seconds
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  // Reads the echoPin, returns the sound wave travel time in microseconds
  duration = pulseIn(echoPin, HIGH);

  // Calculate the distance
  distanceCm = duration * SOUND_SPEED/2;

  // Convert to inches
  distanceInch = distanceCm * CM_TO_INCH;

  // Prints the distance in the Serial Monitor
  Serial.print("Distance (cm): ");
  Serial.println(distanceCm);

  delay(1000);

  PublishData(distanceCm);
  delay(1000);
  if(!client.loop())
  {
    mqttconnect();
  }
}

void PublishData(float distanceCm)
{

  mqttconnect ();
  String payload;

  if(distanceCm<100.0)
  {
    payload = "{\"Alert\":";
    payload += distanceCm;
    payload += "}";
  }
  else
  {
    payload = "{\"distanceCm\":";
    payload += distanceCm;
```

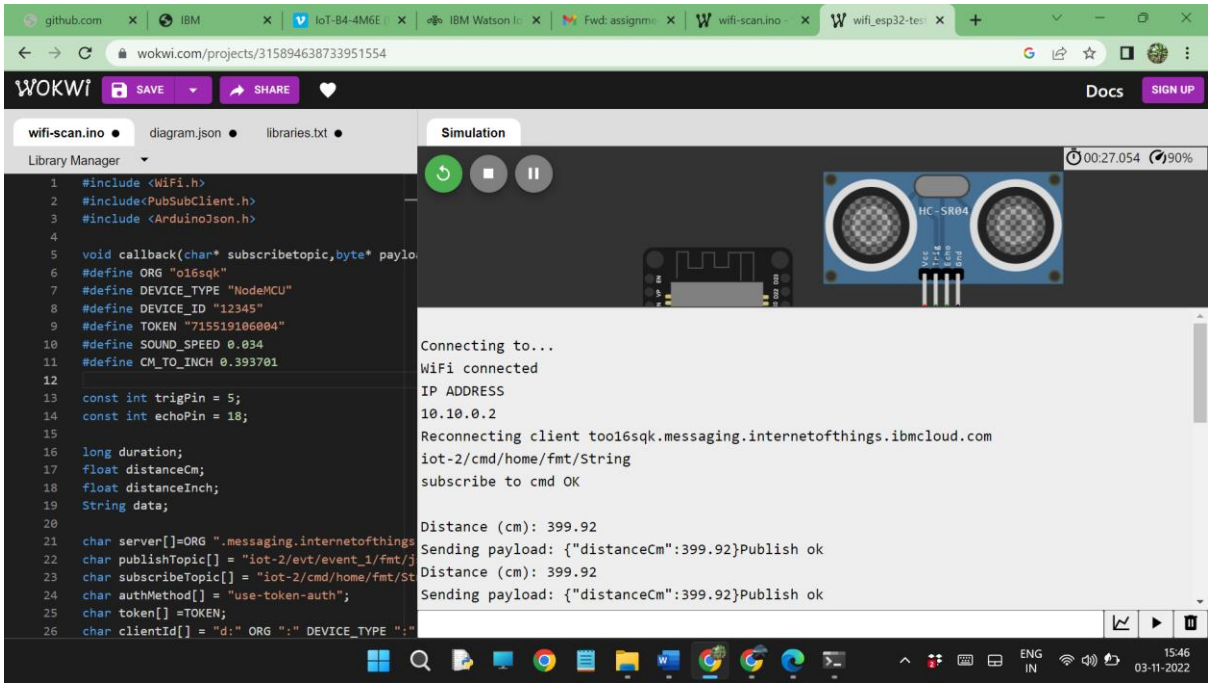
```
   payload += "}";
  }



  Serial.print("Sending payload: ");
  Serial.print(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");
```

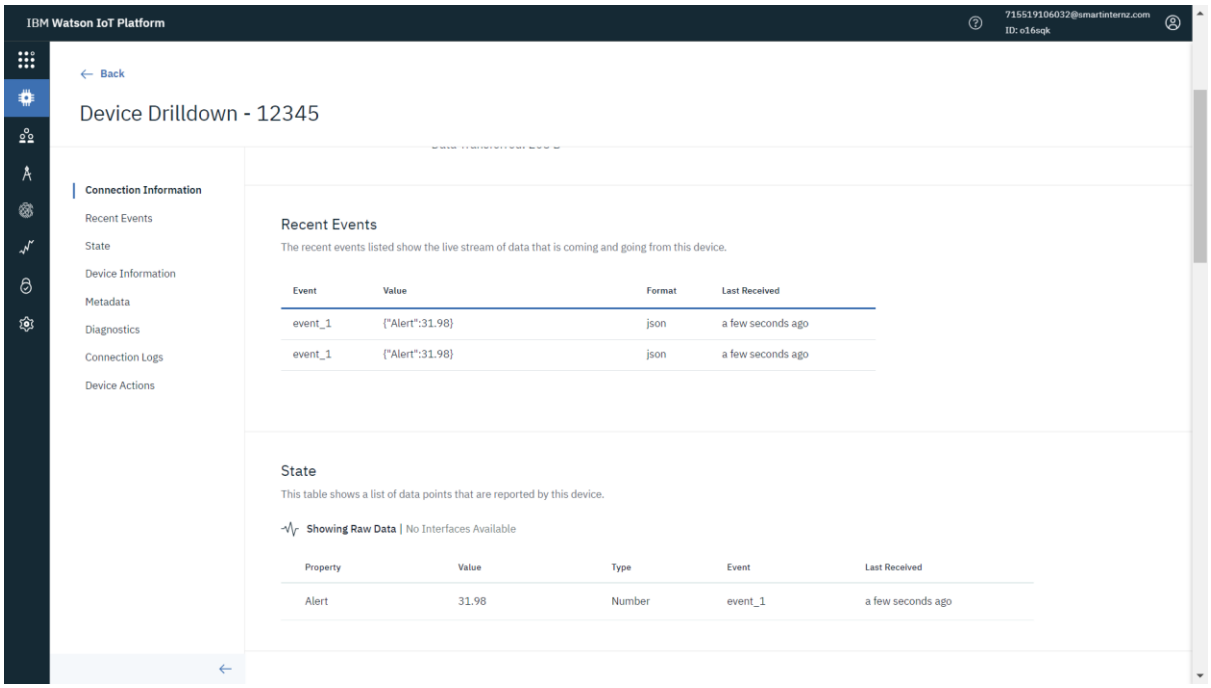
```
 Serial.println(WiFi.localIP());
}
void initManagedDevice()
{
 if(client.subscribe(subscribeTopic))
 {
  Serial.println((subscribeTopic));
  Serial.println("subscribe to cmd OK");
 }
 else
 {
  Serial.println("subscribe to cmd Failed");
 }
}



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++)
 {
  data +=(char)payload[i];
 }
 Serial.println("data: "+data);
 if(data>(char)100)
 {
  Serial.println("Alert!");
 }*/
}
```

CIRCUIT:



OUTPUT:





LINK: https://wokwi.com/projects/347386860662686292