Assignment - 4

Assignment Date	25 October 2022
Team ID	PNT2022TMID47912
Project Title	Smart Waste Management System For Metropolitan Cities
Maximum Marks	2 Marks

Question-1:

Write a code and make a connection in wokwi for ultrasonic sensor. Whenever distance is less than 100 send 'alert' to ibm cloud and display in device recent events.

Solution:

Code:

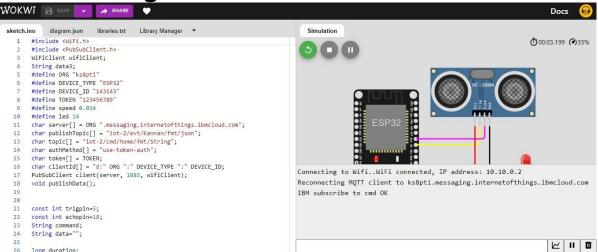
```
#include <WiFi.h>
#include < PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "4yi0vc"
#define DEVICE_TYPE "nodeMcu"
#define DEVICE_ID "Assignment4"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/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(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 = "{\"Normal 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>101 && dist<111){
 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("Warning crosses 110cm -- it automatically of the loop");
  digitalWrite(led,HIGH);
 }else {
  Serial.println("Publish 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++){</pre>
dist += (char)payload[i];
Serial.println("data:"+ data3);
if(data3=="lighton"){
Serial.println(data3);
digitalWrite(led,HIGH);
}
data3="";
```

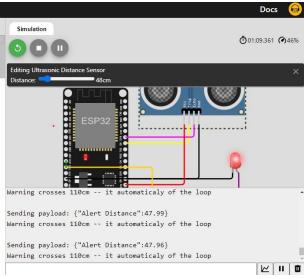
OUTPUT

Distance is greater than 100



IBM cloud is connected and LED is off state

Distance is less than 100



LED is on state