Assignment - 4

Assignment Date	22 October 2022
Student Name	Suzith R
Team ID	PNT2022TMID43416
Project Name	Smart Waste Management System For Metropolitan Cities
Maximum Marks	2 Marks

Question:

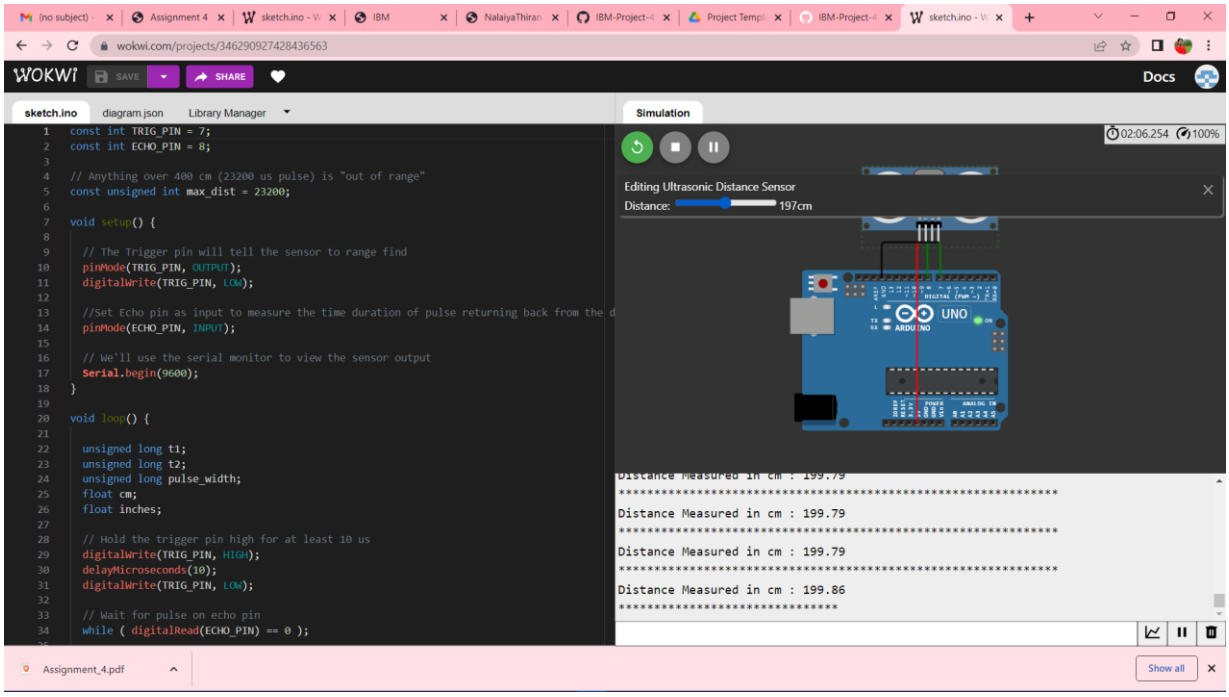
Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100cms send “alert” to ibm cloud and display in device recent events

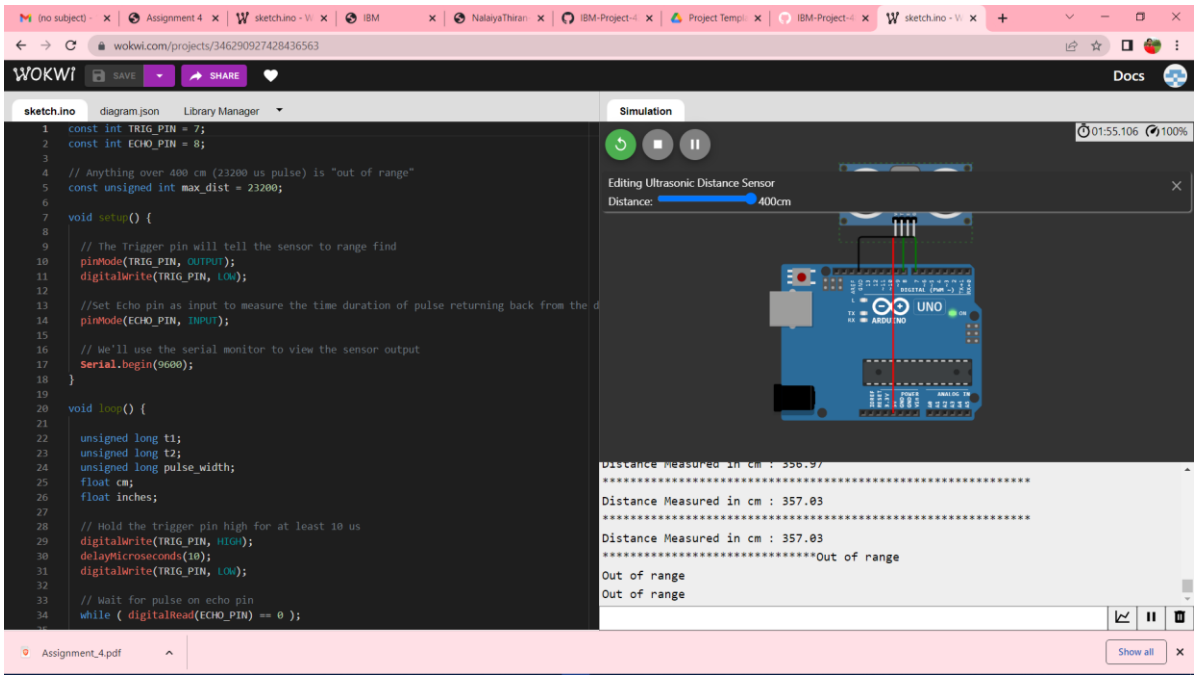
PROGRAM:

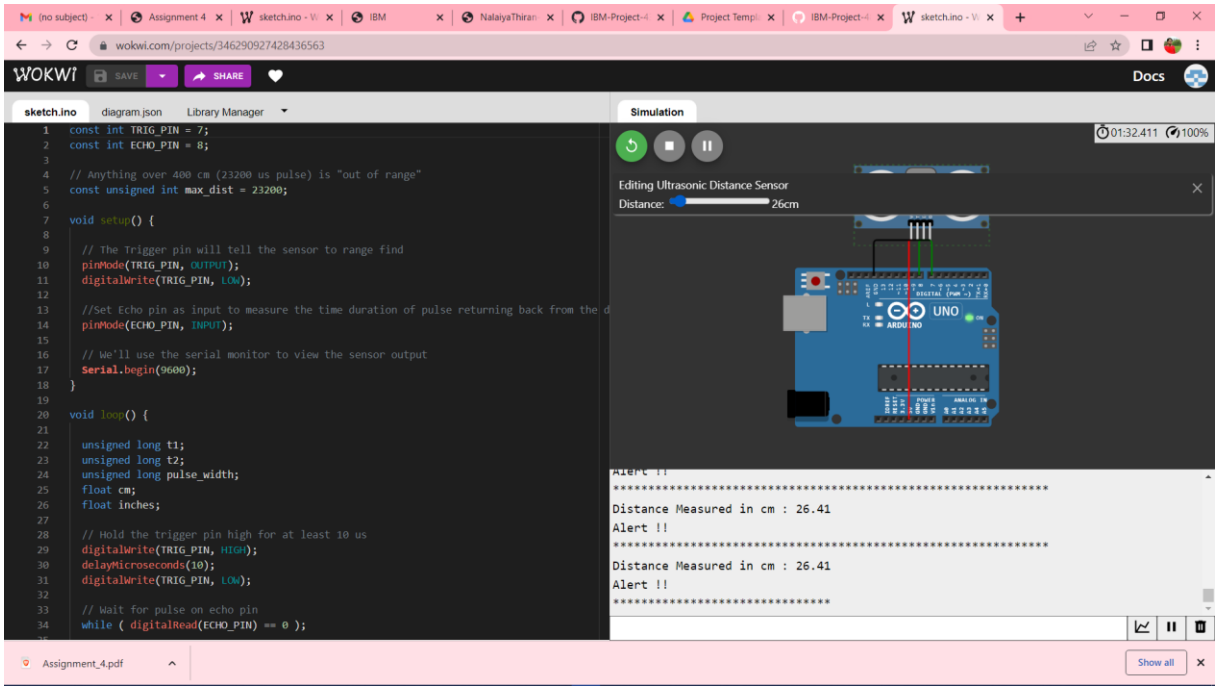
```
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;

// Anything over 400 cm (23200 us pulse) is "out of range"
const unsigned int max_dist = 23200;

void setup() {

  // The Trigger pin will tell the sensor to range find
  pinMode(TRIG_PIN, OUTPUT);
  digitalWrite(TRIG_PIN, LOW);

  //Set Echo pin as input to measure the time duration of pulse returning back from the distance sensor
  pinMode(ECHO_PIN, INPUT);

  // We'll use the serial monitor to view the sensor output
  Serial.begin(9600);
}

void loop() {

  unsigned long t1;
  unsigned long t2;
  unsigned long pulse_width;
  float cm;
  float inches;

  // Hold the trigger pin high for at least 10 us
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);
```

```
  // Wait for pulse on echo pin
  while ( digitalRead(ECHO_PIN) == 0 );

  // Measure how long the echo pin was held high (pulse width)
  // Note: the micros() counter will overflow after ~70 min
  t1 = micros();
  while ( digitalRead(ECHO_PIN) == 1);
  t2 = micros();
  pulse_width = t2 - t1;

  // Calculate distance in centimeters and inches. The constants
  // are found in the datasheet, and calculated from the assumed speed
  //of sound in air at sea level (~340 m/s).
  cm = pulse_width / 58.0;
  inches = pulse_width / 148.0;

  // Print out results
  if ( pulse_width > max_dist ) {
    Serial.println("Out of range");
  } else {
    Serial.println("******************************");
    Serial.print("Distance Measured in cm : ");
    Serial.println(cm);

    if(cm<100){
      // while(true){
      Serial.println("Alert !!");
      // }
    }

    Serial.print("******************************");
  }

  // Wait at least 1000ms before next measurement
  delay(1000);
}
```

OUTPUT:


wokwi.com/projects/346290927428436563
WOKWI
SAVE
SHARE
Docs
sketch.ino
diagram.json
Library Manager
Simulation
02:06.254
100%
Editing Ultrasonic Distance Sensor
Distance:
197cm
Distance Measured in cm : 199.79
Distance Measured in cm : 199.79
Distance Measured in cm : 199.79
Distance Measured in cm : 199.86
Assignment_4.pdf
Show all


wokwi.com/projects/346290927428436563
WOKWI
SAVE
SHARE
Docs
sketch.ino
diagram.json
Library Manager
Simulation
01:55.106
100%
Editing Ultrasonic Distance Sensor
Distance:
400cm
Distance Measured in cm : 357.03
Distance Measured in cm : 357.03
Out of range
Out of range
Assignment_4.pdf
Show all




```ino
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;

// Anything over 400 cm (23200 us pulse) is "out of range"
const unsigned int max_dist = 23200;

void setup() {

  // The Trigger pin will tell the sensor to range find
  pinMode(TRIG_PIN, OUTPUT);
  digitalWrite(TRIG_PIN, LOW);

  //Set Echo pin as input to measure the time duration of pulse returning back from the d
  pinMode(ECHO_PIN, INPUT);

  // We'll use the serial monitor to view the sensor output
  Serial.begin(9600);
}

void loop() {

  unsigned long t1;
  unsigned long t2;
  unsigned long pulse_width;
  float cm;
  float inches;

  // Hold the trigger pin high for at least 10 us
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);

  // Wait for pulse on echo pin
  while ( digitalRead(ECHO_PIN) == 0 );
```

Project Link: https://wokwi.com/projects/346290927428436563