Assignment - 4

Assignment Date	22 October 2022
Student Name	MURALIDHARAN M
Student Roll Number	611819106028
Maximum Marks	2 Marks

Question-1:

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

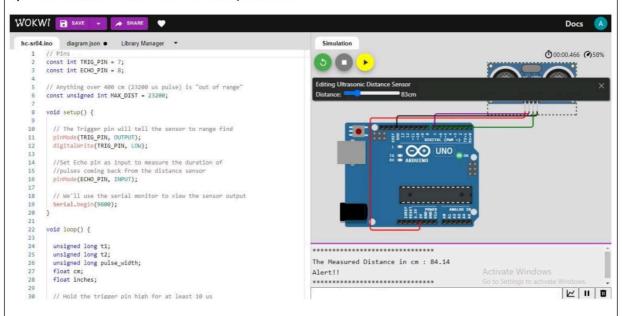
Solution:

```
// Pins
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 duration of
 //pulses coming 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("The Measured Distance 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:

1) If the distance is less than 100 cms, it alerts.



2) If the distance is more than 100 cms, it won't alert.

```
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                                                                                      Simulation
 hc-sr04.ino diagram.json ● Library Manager ▼
        // Pins
                                                                                                                                                    ₫00:00.599 (%62%
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   10
   11
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                                                                                                             OO UNO □
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          //pulses coming back from the distance sensor
   16
          pinMode(ECHO_PIN, INPUT);
   17
          // We'll use the serial monitor to view the sensor output
   19
          Serial.begin(9600);
                                                                                                             POWER ANALOG I
   20
   21
   22
         void loop() {
   23
          unsigned long t1;
                                                                                   *****************
          unsigned long t2;
                                                                                   The Measured Distance in cm : 227.10
          unsigned long pulse_width;
float cm;
   26
   27
                                                                                                                                   Activate Windows
          float inches;
                                                                                                                                   Go to Settings to activate Window
                                                                                                                                                          ∠ II 0
        // Hold the trigger pin high for at least 10 us
```

3) Simulation and code execution

