Assignment Date	26.10.2022
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Student Roll Number	611819106503
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.
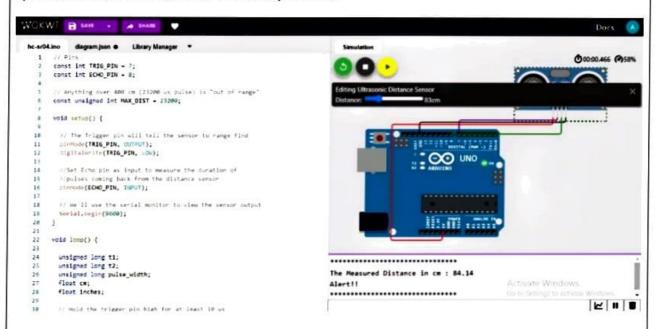
Solution:

```
// 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;
```
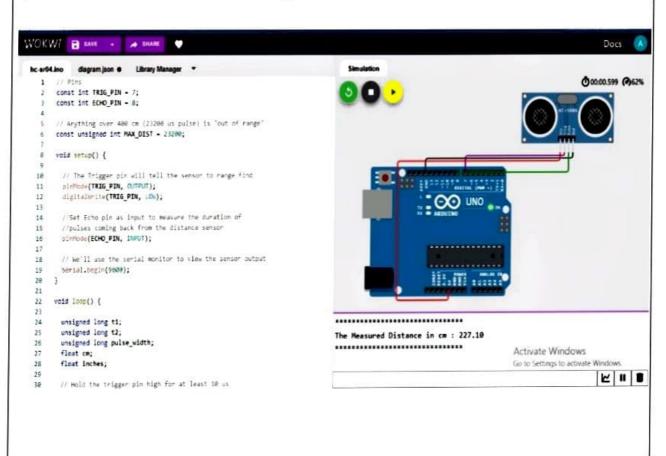
// Hold the trigger pin high for at least 10 us

```cpp
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
~70min 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.prin
    tln("Alert!!");
    // }
  }

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

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

Output:

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

The screenshot shows Wokwi editor with code:

```
1    // Pins
2    const int TRIG_PIN = 7;
3    const int ECHO_PIN = 8;
4
5    // Anything over 400 cm (23200 us pulse) is "out of range"
6    const unsigned int MAX_DIST = 23200;
7
8    void setup() {
9
10       // The trigger pin will tell the sensor to range find
11       pinMode(TRIG_PIN, OUTPUT);
12       digitalWrite(TRIG_PIN, LOW);
13
14       //Set Echo pin as input to measure the duration of
15       //pulses coming back from the distance sensor
16       pinMode(ECHO_PIN, INPUT);
17
18       // We'll use the serial monitor to view the sensor output
19       Serial.begin(9600);
20    }
21
22    void loop() {
23
24       unsigned long t1;
25       unsigned long t2;
26       unsigned long pulse_width;
27       float cm;
28       float inches;
29
30       // Hold the trigger pin high for at least 10 us
```

Editing Ultrasonic Distance Sensor — Distance: 83cm

The Measured Distance in cm : 84.14
Alert!!

2) If the distance is more than 100 cms, it won'talert.

The screenshot shows Wokwi editor with code:

```
1    // Pins
2    const int TRIG_PIN = 7;
3    const int ECHO_PIN = 8;
4
5    // Anything over 400 cm (23200 us pulse) is "out of range"
6    const unsigned int MAX_DIST = 23200;
7
8    void setup() {
9
10       // The trigger pin will tell the sensor to range find
11       pinMode(TRIG_PIN, OUTPUT);
12       digitalWrite(TRIG_PIN, LOW);
13
14       //Set Echo pin as input to measure the duration of
15       //pulses coming back from the distance sensor
16       pinMode(ECHO_PIN, INPUT);
17
18       // We'll use the serial monitor to view the sensor output
19       Serial.begin(9600);
20    }
21
22    void loop() {
23
24       unsigned long t1;
25       unsigned long t2;
26       unsigned long pulse_width;
27       float cm;
28       float inches;
29
30       // Hold the trigger pin high for at least 10 us
```

The Measured Distance in cm : 227.10

3) Simulation and codeexecution


```
**********************************
The Measured Distance in cm : 201.79
**********************************
```

```
**********************************
The Measured Distance in cm : 57.79
Alert it !!
**********************************
```