

Assignment 4

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1. Write Code and connections in wokwi for ultrasonic sensor. whatever 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
```

```
Pin Mode(TRIG_PIN, OUTPUT); digital
```

```
Write(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 (- 340m/s)
cm=pulse_Width / 58 ;  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);

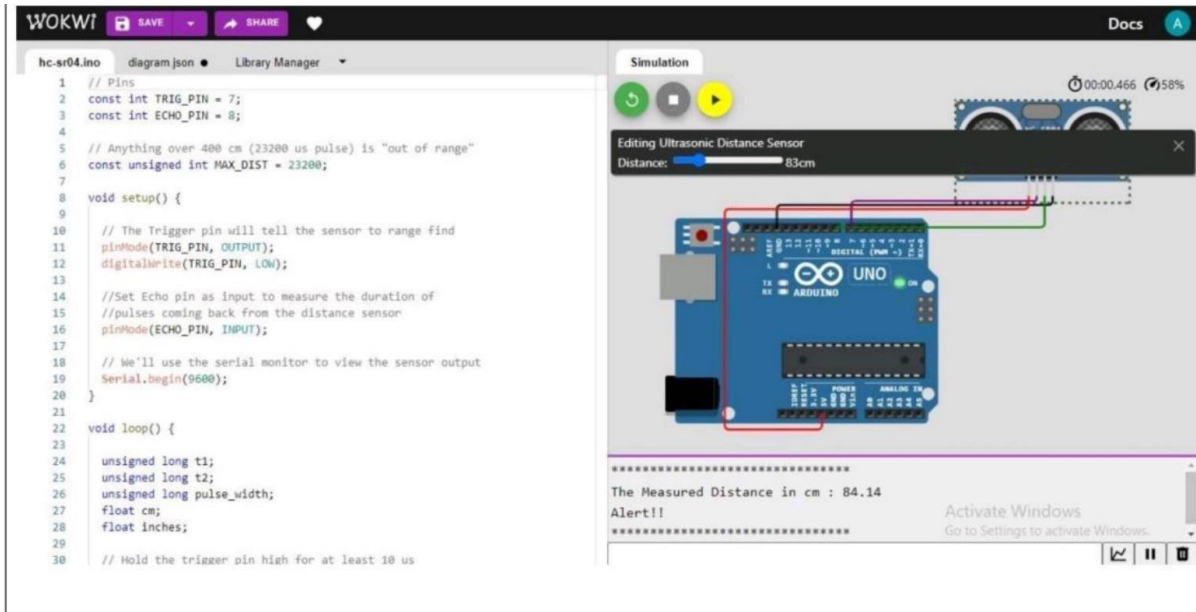
if( cm < 100 ){
    //while(true){
        Serial.println("Alert!!");
        //}
    }
Serial.print("*****");
}

//wait at least 1000ms before next measurement
Delay(1000);
}

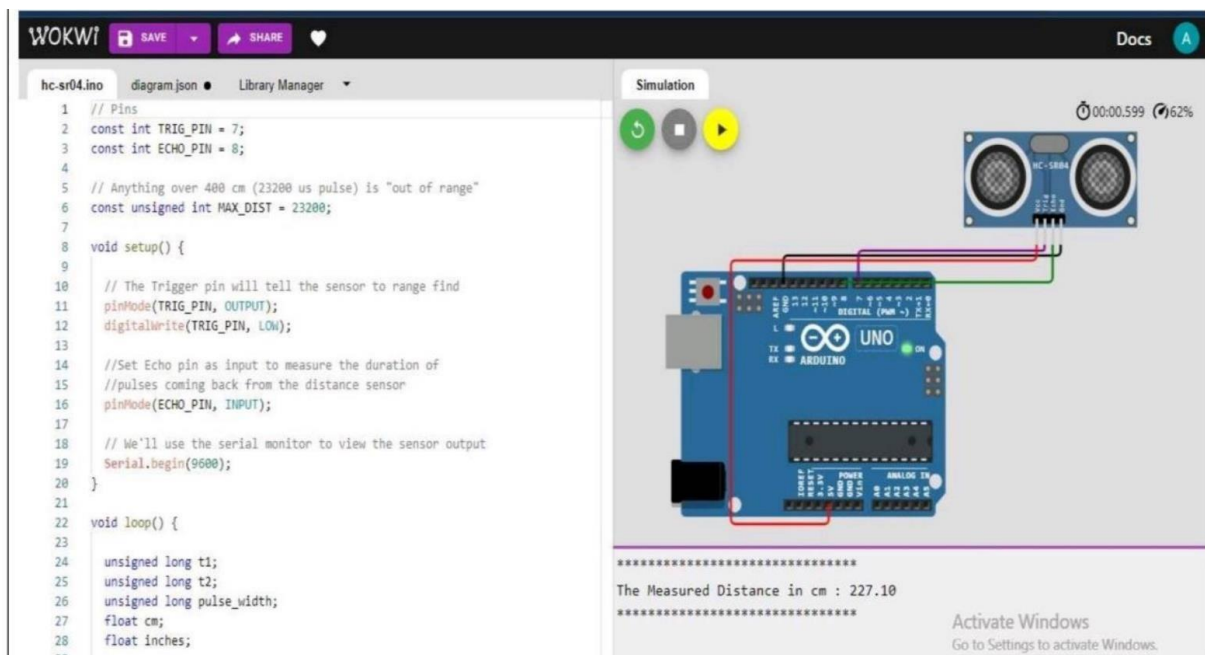
```

Output:

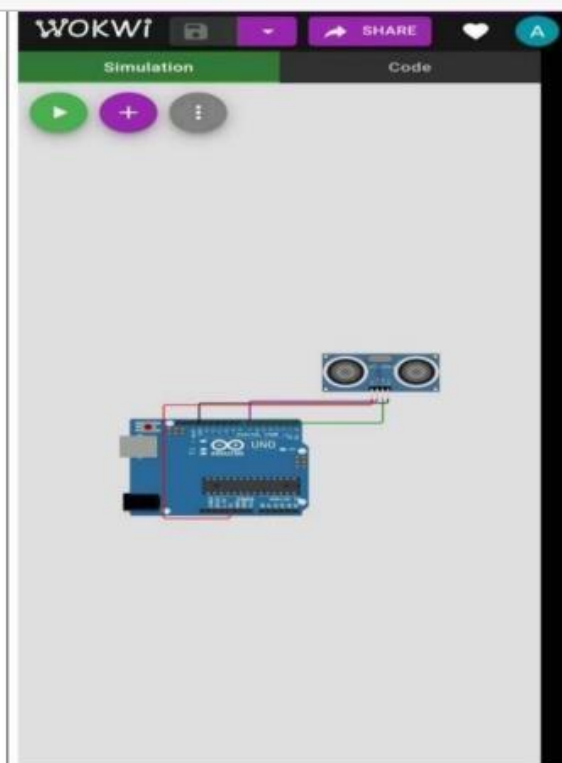
1.If the distance is less than 100 cms ,it alerts.



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



3.Simulation and code execution



```

1 // Trig
2 const int TRIG_PIN = 2;
3 const int ECHO_PIN = 3;
4
5 // Anything over 400 cm (1200 us pulse) is "out of range"
6 const unsigned int MAX_DIST = 2200;
7
8 void setup() {
9
10 // The Trigger pin will send 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 see the sensor output
19 Serial.begin(9600);
20
21 }
22
23 void loop() {
24
25   unsigned long t1;
26   unsigned long t2;
27   unsigned long pulse_width;
28   float cm;
29   float inches;
30
31 // Hold the trigger pin high for at least 10 us
32 digitalWrite(TRIG_PIN, HIGH);
33 delayMicroseconds(10);
34 digitalWrite(TRIG_PIN, LOW);
35
36 // Wait for pulse on echo pin
37 while ( !digitalRead(ECHO_PIN) ) {}
38
39 // Measure how long the echo pin was held high (pulse width)
40 // Note: the default number will overflow after ~10 min
41 t1 = micros();
42 while ( !digitalRead(ECHO_PIN) ) {}
43 t2 = micros();
44 pulse_width = t2 - t1;
45
46 // Calculate distance in centimeters and inches. The constants
47 // are found in the datasheet, and calculated from the speed of sound
48 // (not used in our code here) (340 m/s).
49 cm = pulse_width / 58.0;
50 inches = pulse_width / 148.0;
51
52 // Print our results
53 if ( pulse_width > MAX_DIST ) {
54   Serial.println("Out of range!");
55 } else {
56   Serial.println("The Measured Distance in cm : ");
57   Serial.print(cm);
58 }
59
60 if(cm>100){
61   Serial.println("Alert it !!");
62 }
63
64 Serial.println("~~~~~");
65
66 // Wait at least 100ms before next measurement
67 delay(100);
68 }

```

