

IBM ASSIGNMENT- 4 TEAM

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Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cms send "Alert" to ibm cloud aand 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);

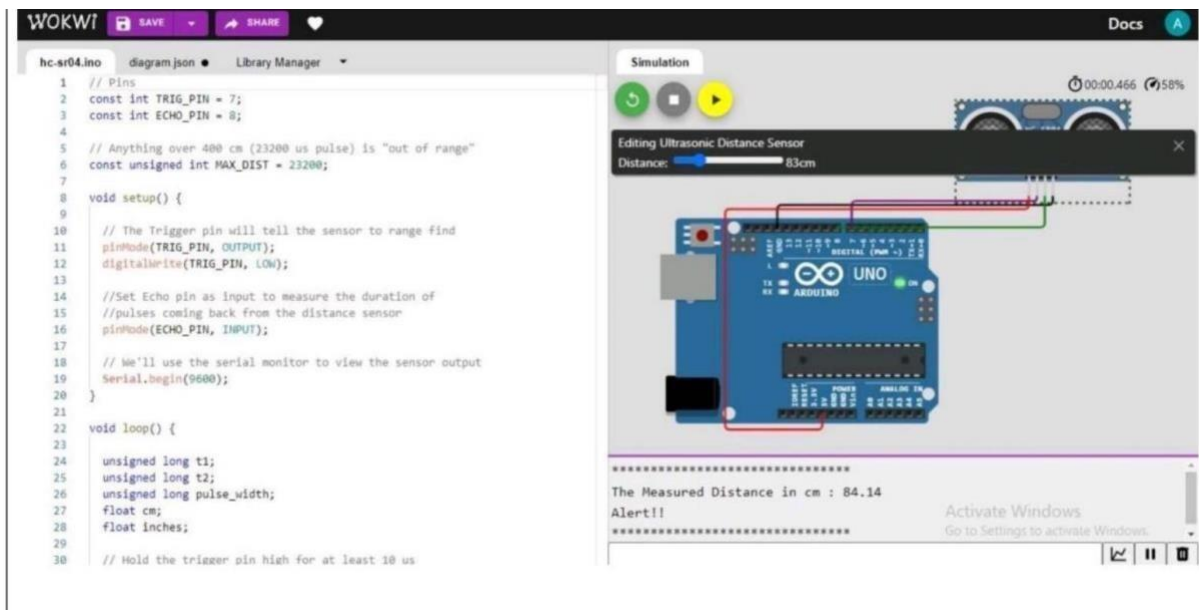
if( cm < 100 ){
    //while(true){
        Serial.println("Alert!!");
        //}
    }
Serial.print("*****");
}

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

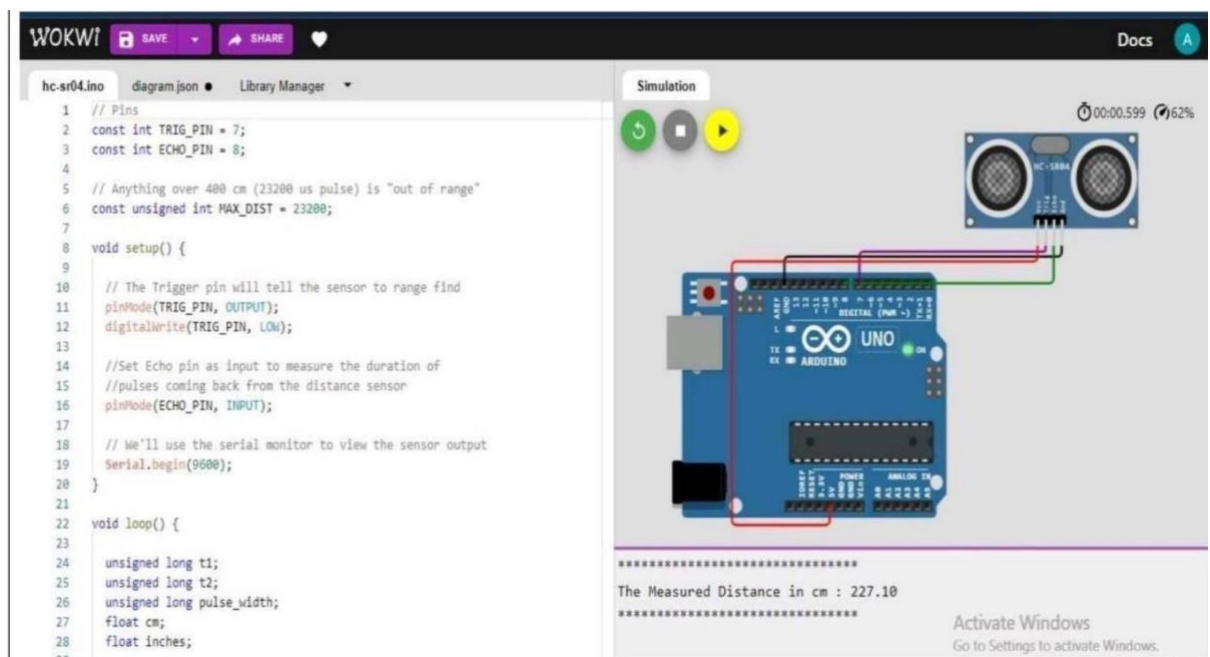
```

Output:

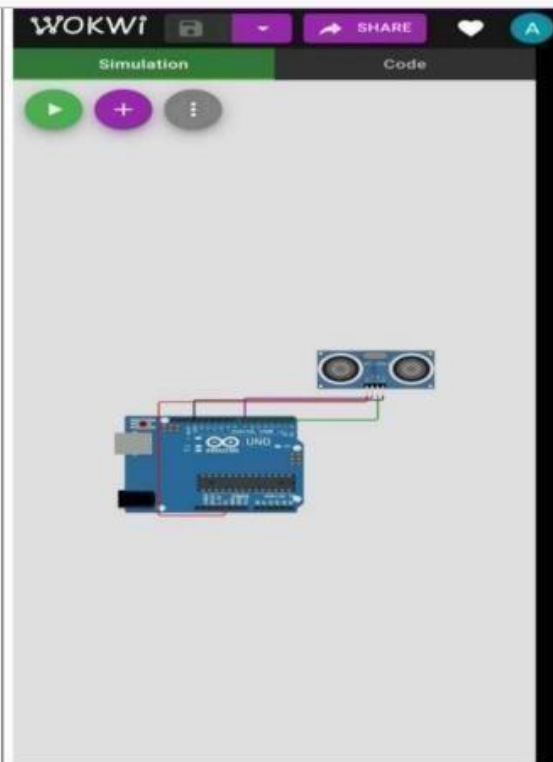
1.If the distance is less than 100 cms ,it alerts.



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



3.Simulation and code execution



```

1 // Pin
2 const int TRIG_PIN = 5;
3 const int ECHO_PIN = 4;
4 // anything over 400 cm (1200 us pulse) is "out of range"
5 const unsigned int MAX_DIST = 2000;
6
7 void setup() {
8
9   // The trigger pin will pull the sensor's range pin
10  pinMode(TRIG_PIN, OUTPUT);
11  digitalWrite(TRIG_PIN, LOW);
12
13  // Set the pin as input to measure the duration of
14  // pulses coming back from the distance sensor
15  pinMode(ECHO_PIN, INPUT);
16
17  // We'll use the serial monitor to view the sensor output
18  Serial.begin(9600);
19
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
31   digitalWrite(TRIG_PIN, HIGH);
32   delayMicroseconds(10);
33   digitalWrite(TRIG_PIN, LOW);
34
35   // Wait for pulse on echo pin
36   while (digitalRead(ECHO_PIN) == 0) {}
37
38   // Measure how long the echo pin was held high (pulse width)
39   // Now, the measured distance will overflow after ~10 m
40   t1 = micros();
41   while (digitalRead(ECHO_PIN) == 1) {}
42   t2 = micros();
43   pulse_width = t2 - t1;
44
45   // Calculate distance in centimeters and inches. The constants
46   // are based on the speed of sound, and calculated from the assumed speed
47   // of sound in air at sea level (340 m/s).
48   cm = pulse_width / 58.0;
49   inches = pulse_width / 148.0;
50
51   // Print out results:
52   if ( pulse_width < MAX_DIST ) {
53     Serial.println("Not of range");
54   } else {
55     Serial.println("*****");
56     Serial.println("The Measured Distance in cm : ");
57     Serial.println(cm);
58
59     if(cm>100){
60       Serial.println("Alert it !!");
61     }
62   }
63   Serial.println("*****");
64 }
65
66 // Wait at least 1000ms before next measurement
67 delay(1000);
68 }

```

