Assignment-4

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1. Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cm 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
```

```arduino
  //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);
}
```
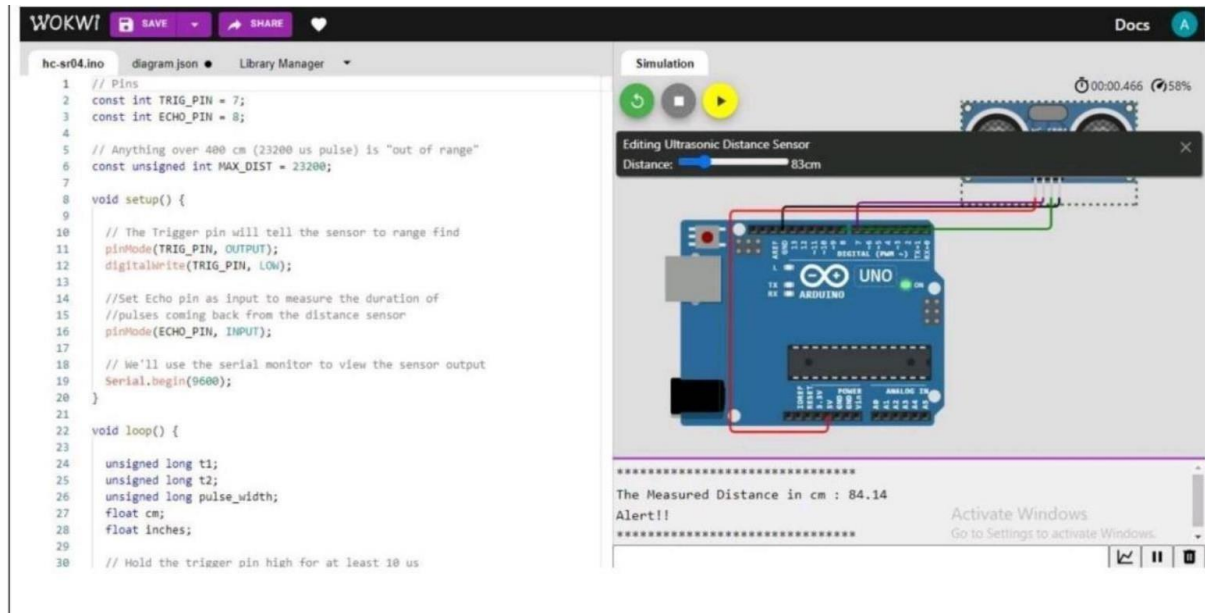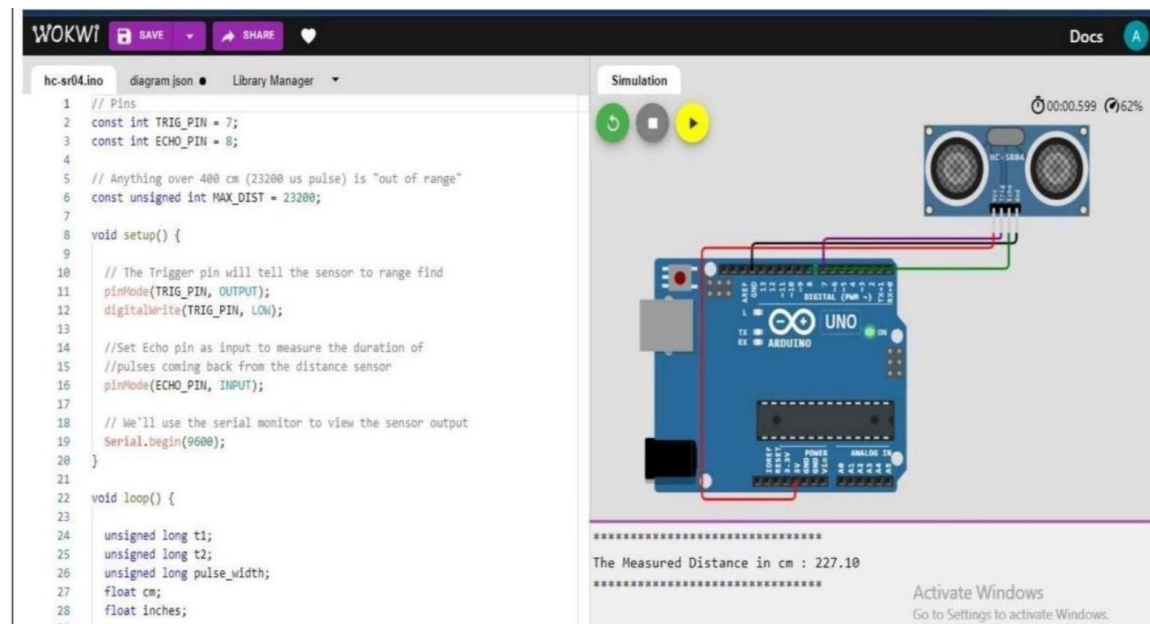
Output:

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

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

3. Simulation and code execution


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



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