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 devicerecent events.

Solutin:

```
//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);
```

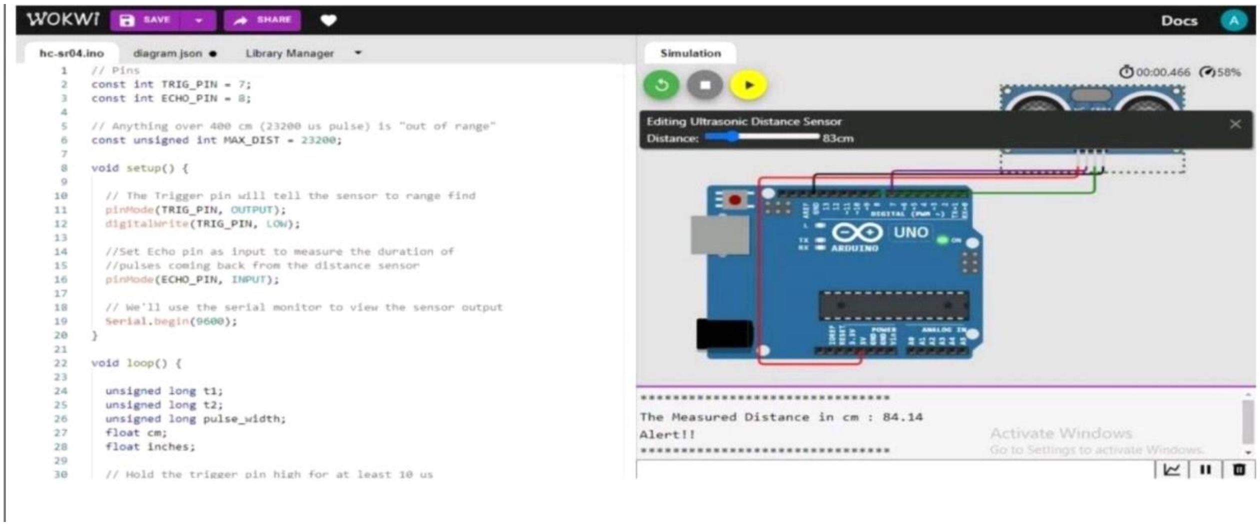
```
// Wait for pulse on echo pin
while (digitalRead( ECHO_PIN )==0 );

// Measure how long the echo pin was held high (pulse width)
 // Note: the micros() counter will overflow after-70
 mint1= 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
 measurementDelay(1000);
 }
```

Output:

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



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void setup() {

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  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);
}

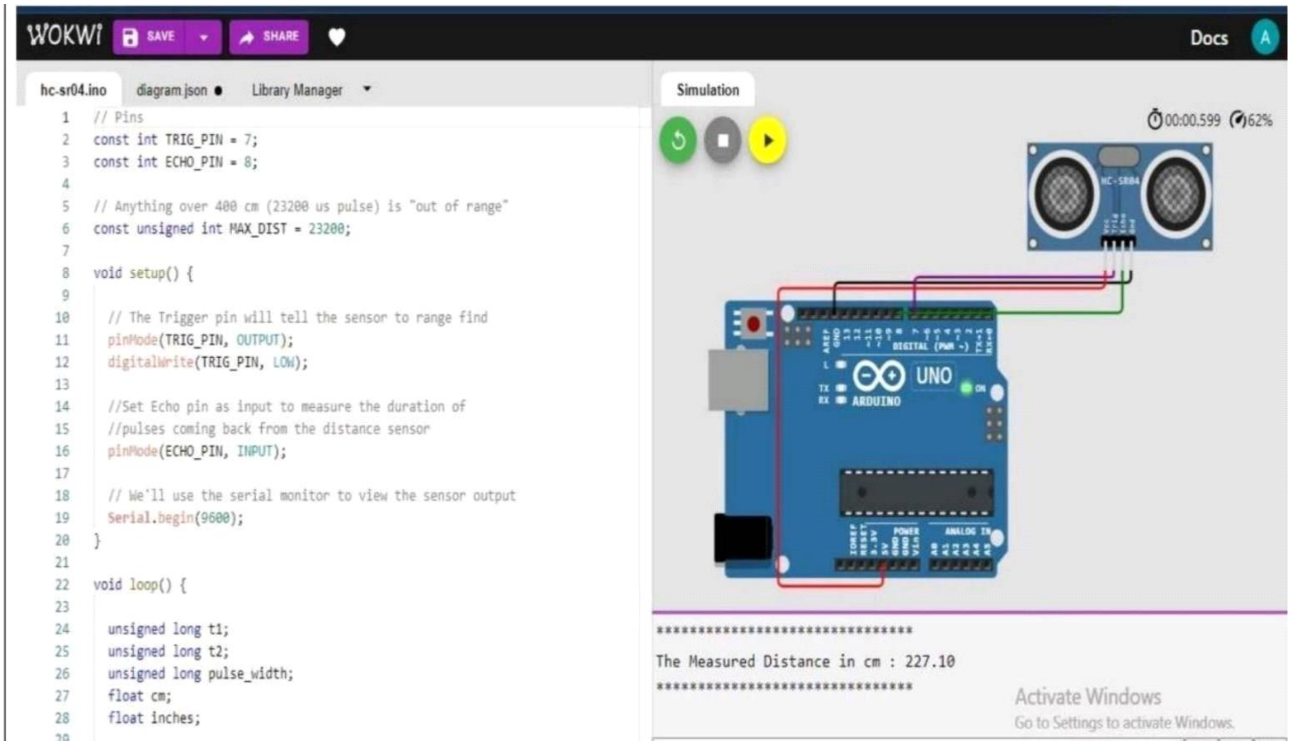
void loop() {

  unsigned long t1;
  unsigned long t2;
  unsigned long pulse_width;
  float cm;
  float inches;

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

```
*********************************
The Measured Distance in cm : 84.14
Alert!!
*********************************
```

- **If the distance is more than 100 cm, it won’t alert**



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  pinMode(TRIG_PIN, OUTPUT);
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  //pulses coming back from the distance sensor
  pinMode(ECHO_PIN, INPUT);

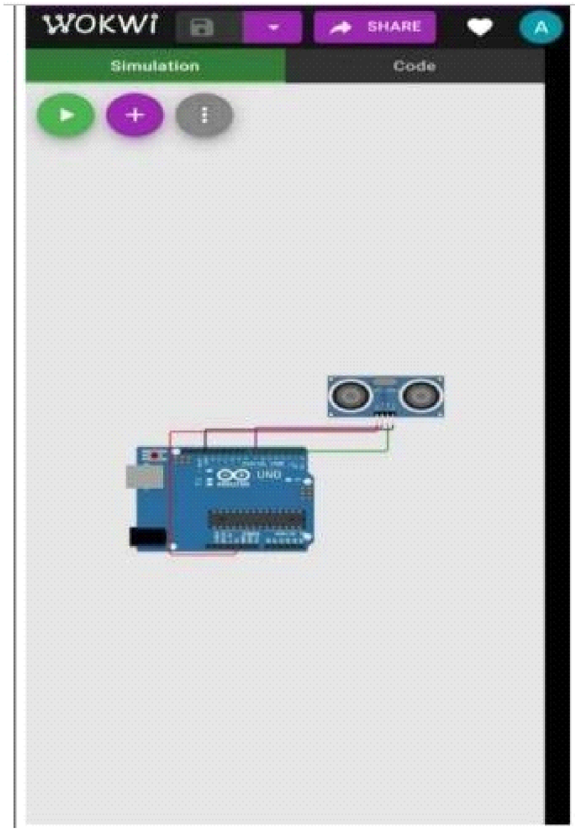
  // We'll use the serial monitor to view the sensor output
  Serial.begin(9600);
}

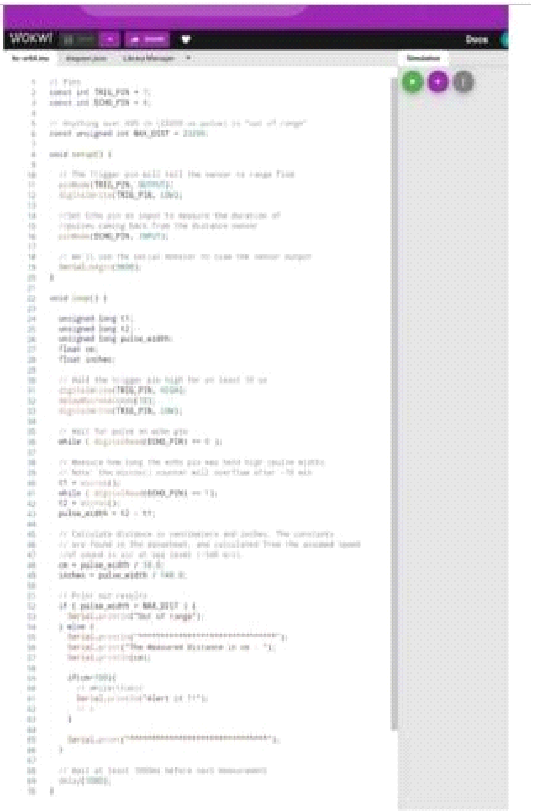
void loop() {

  unsigned long t1;
  unsigned long t2;
  unsigned long pulse_width;
  float cm;
  float inches;
```

```
********************************
The Measured Distance in cm : 227.10
********************************
```

- **Simulation and code execution**





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  //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;

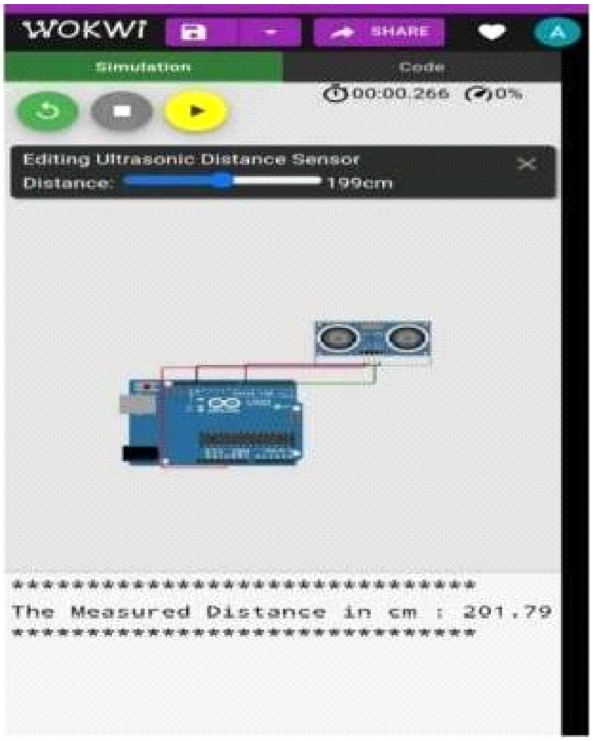
  // Calculate distance in centimeters and inches. The constants
  // are found in the datasheet, and calculated from the assumed speed
  //of sound in air at sea level (~340 m/s).
  cm = pulse_width / 58.0;
  inches = pulse_width / 148.0;

  // 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 !! !!");
      // }
    }

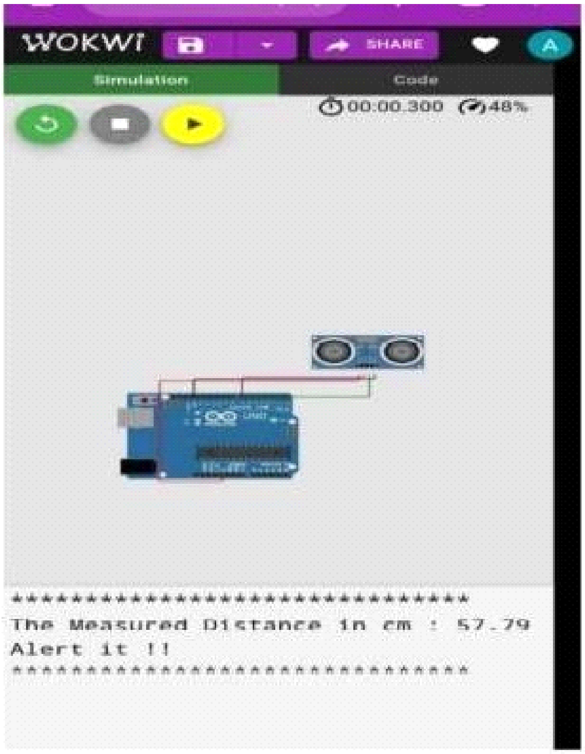
    Serial.print("********************************");
  }

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



Editing Ultrasonic Distance Sensor
Distance: 199cm

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



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