

Assignment - 4

Assignment Date	21 October 2022
Student Name	HARSHAVARTHAN S R
Student Roll Number	813819205020
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
    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);
}
```

Output:

1)If the distance less than 100 cms it gives an alert.

hc-sr04.ino

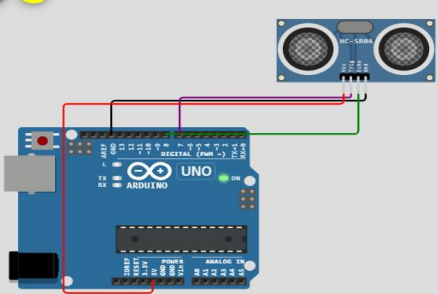
diagram.json

Library Manager

```
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
```

Simulation

00:00.633 63%



The Measured Distance in cm : 34.48
Alert it !!

Activate Windows
Go to Settings to activate Windows.

2)If the distance is more than 100 cms it does not give ant alert.

hc-sr04.ino

diagram.json

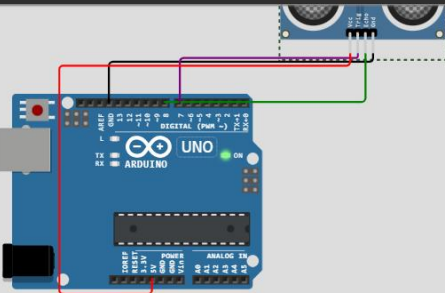
Library Manager

```
1 // Pins
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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
```

Simulation

00:00.599 67%

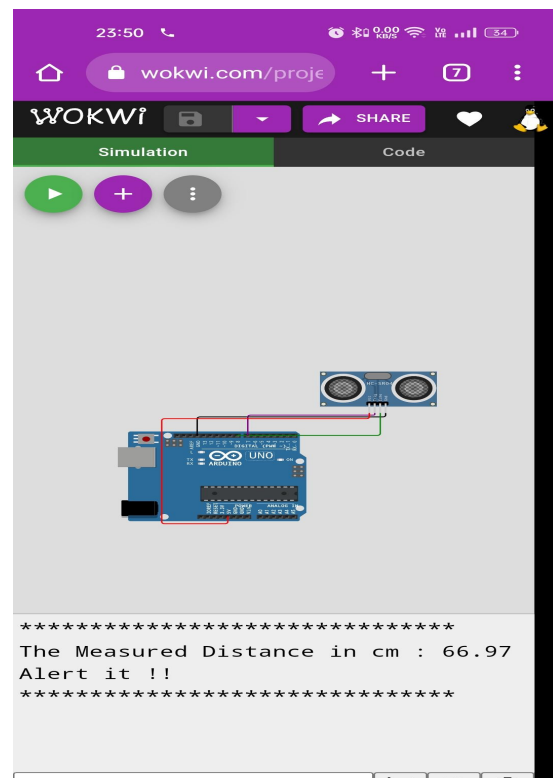
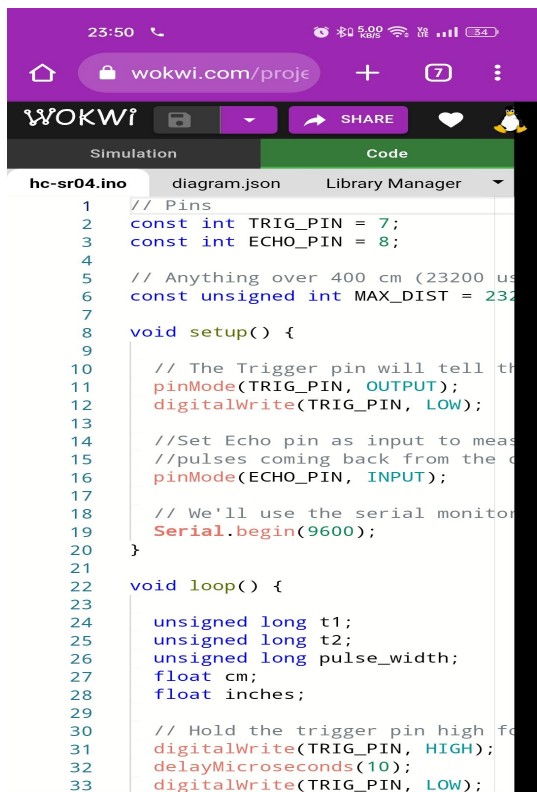
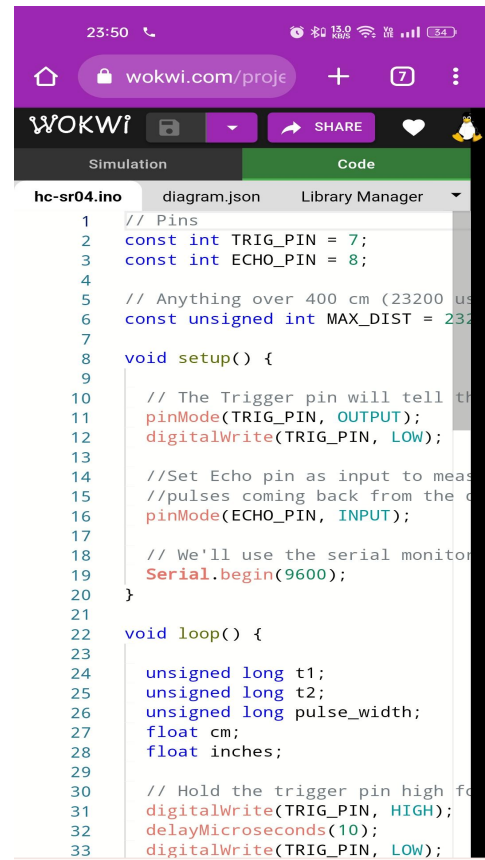
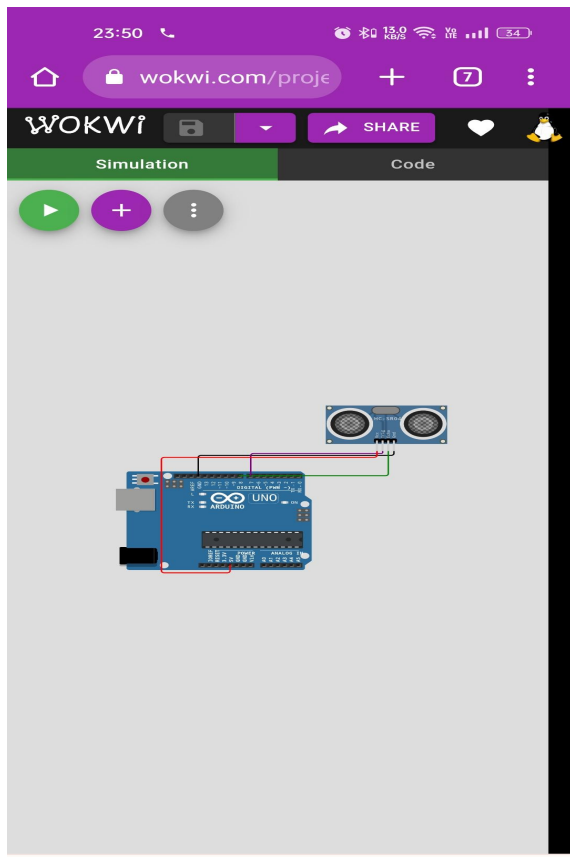
Editing Ultrasonic Distance Sensor
Distance: 323cm

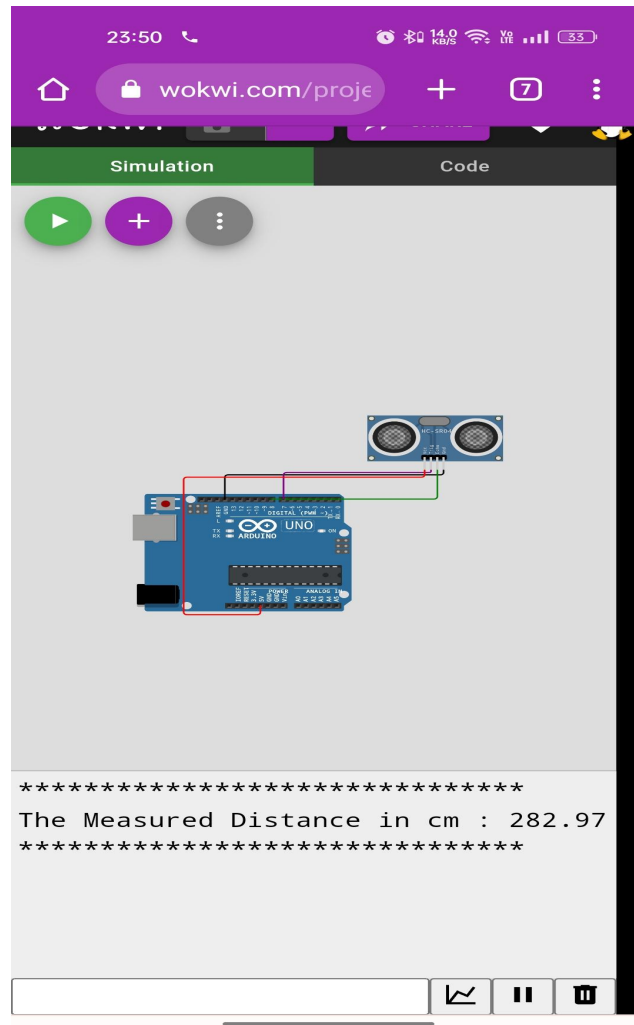


The Measured Distance in cm : 327.52

Activate Windows
Go to Settings to activate Windows.

3) Simulation and code execution





Project Link:

<https://wokwi.com/projects/346136429340918356>