

Assignment -4

Assignment Date	21 October 2022
Student Name	Mr. Mohamed Ameen A
Student Roll Number	813819205036
Maximum Marks	2 Marks

Question-1:

To write a code and connection in wokwi for ultrasonic sensor. Whenever distance is less than 100cms send alert to IBM cloud to display in device recent events

Code:

```
// 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 Distance in cm is: ");
  Serial.println(cm);

  if(cm>100){
    // while(true){
    Serial.println("Alert!!");
    // }
  }
  else{
    Serial.println("Don't Alert it !!");
  }

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

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

```

Output:

For distance greater than 100

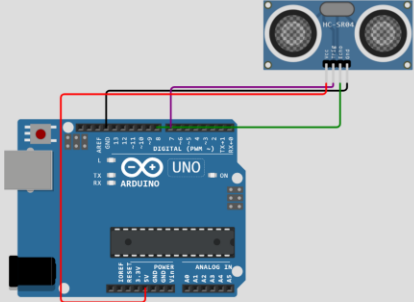
hc-sr04.ino

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
31 digitalWrite(TRIG_PIN, HIGH);
32 delayMicroseconds(10);
33 digitalWrite(TRIG_PIN, LOW);
34
35 // Wait for pulse on echo pin
```

Simulation



The Measured Distance in cm : 160.28
Alert it !!

For distance less than 100

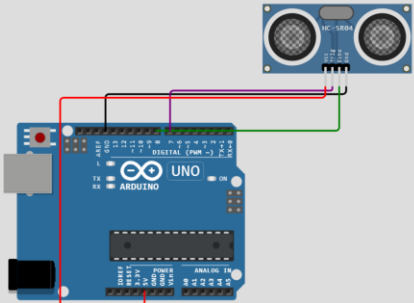
hc-sr04.ino

diagram.json

Library Manager

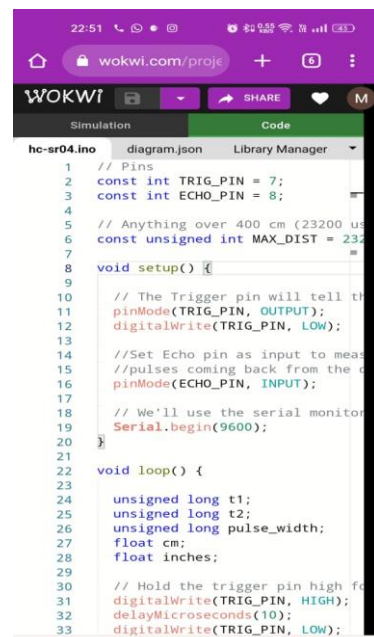
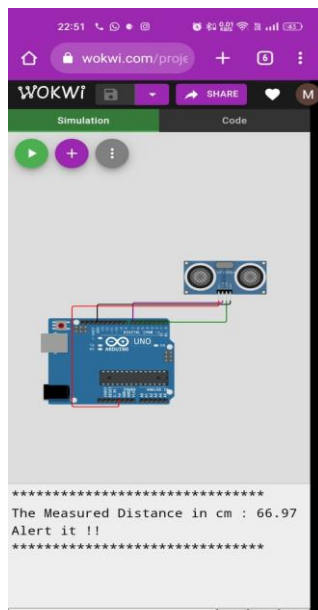
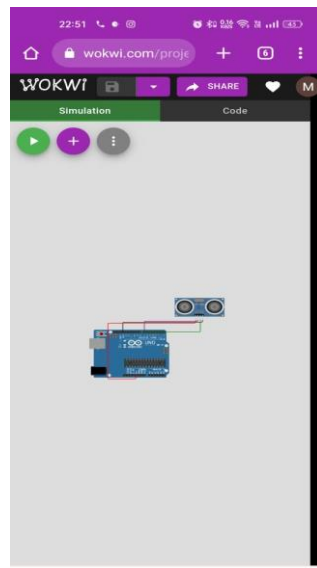
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4
5 // Anything over 400 cm (23200 us pulse) is "out of range"
6 const unsigned int MAX_DIST = 23200;
7
8 void setup() {
9
10 // The Trigger pin will tell the sensor to range find
11 pinMode(TRIG_PIN, OUTPUT);
12 digitalWrite(TRIG_PIN, LOW);
13
14 //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
31 digitalWrite(TRIG_PIN, HIGH);
32 delayMicroseconds(10);
33 digitalWrite(TRIG_PIN, LOW);
34
35 // Wait for pulse on echo pin
```

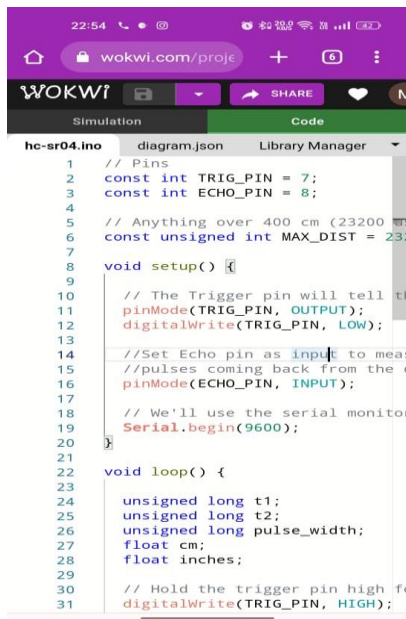
Simulation



The Measured Distance in cm : 43.59
Don't Alert it !!

Stimulation and Code Execution





22:54

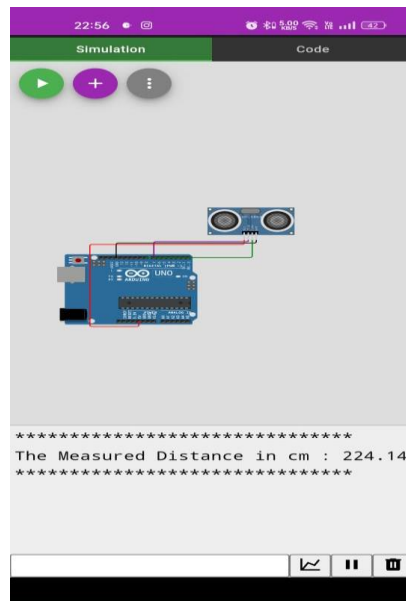
wokwi.com/proj

WOKWI

Simulation Code

hc-sr04.ino diagram.json Library Manager

```
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2 const int TRIG_PIN = 7;
3 const int ECHO_PIN = 8;
4
5 // Anything over 400 cm (23200 us)
6 const unsigned int MAX_DIST = 23200;
7
8 void setup() {
9
10 // The Trigger pin will tell the sensor to send a pulse
11 pinMode(TRIG_PIN, OUTPUT);
12 digitalWrite(TRIG_PIN, LOW);
13
14 // Set Echo pin as input to measure the time it takes for the pulse to come back
15 pinMode(ECHO_PIN, INPUT);
16
17 // We'll use the serial monitor to see the results
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 10 microseconds
31 digitalWrite(TRIG_PIN, HIGH);
```



Project Link: <https://wokwi.com/projects/346139032040768084>