

ASSIGNMENT-4

Wokwi Program

Assignment Date	19 October 2022
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Maximum Marks	2 Marks

Question-1

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events.

Program

```
//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 (- 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

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

The image displays two screenshots of the Wokwi IDE interface, showing the simulation of an ultrasonic distance sensor connected to an Arduino Uno. The code in the sketch.ino file is as follows:

```
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 //Set Echo pin as input to measure the duration of
14 //pulses coming back from the distance sensor
15 pinMode(ECHO_PIN, INPUT );
16 // We'll use the serial monitor to view the sensor output
17 Serial.begin(9600);
18 }
19
20 void loop() {
21   unsigned long t1;
22   unsigned long t2;
23   unsigned long pulse_width;
24   float cm;
25   float inches;
```

Top Screenshot: The simulation shows the sensor at a distance of 2cm. The output text in the simulation window reads:

```
***
The Measured Distance in cm: 368.00
*****Out of range
*****
The Measured Distance in cm: 197.00
*****
The Measured Distance in cm: 2.00
Alert!!
*****
```

Bottom Screenshot: The simulation shows the sensor at a distance of 2.00cm. The output text in the simulation window reads:

```
*****
The Measured Distance in cm: 2.00
Alert!!
*****
```

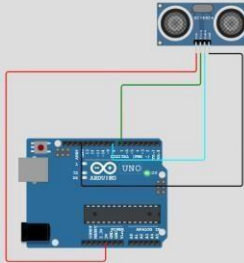
WOKWI

sketch.ino diagram.json Library Manager

```
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14 //pulses coming back from the distance sensor
15 pinMode(ECHO_PIN, INPUT );
16 // We'll use the serial monitor to view the sensor output
17 Serial.begin(9600);
18 }
19
20 void loop() {
21   unsigned long t1;
22   unsigned long t2;
23   unsigned long pulse_width;
24   float cm;
25   float inches;
```

Simulation

00:44.723 97%



The Measured Distance in cm: 91.00

Alert!!

The Measured Distance in cm: 124.00

3.2 KBps
0.1 KBps

ENG
IN

12:25
28-10-2022

Link:

<https://wokwi.com/projects/346743469024215636>