

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 online Arduino IDE interface, showing the simulation of an ultrasonic sensor connected to an Arduino Uno.

Top Screenshot:

- Code (sketch.ino):**

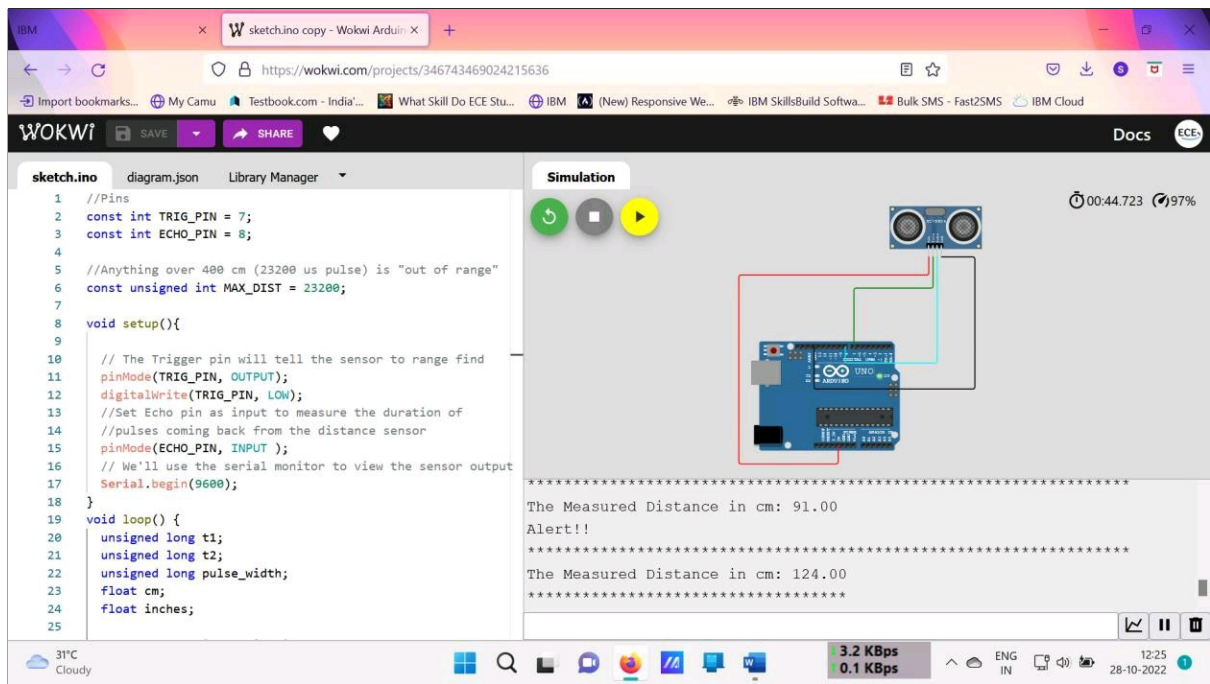
```
1 //Pins
2 const int TRIG_PIN = 7;
3 const int ECHO_PIN = 8;
4
5 //Anything over 400 cm (23200 us pulse) is "out of range"
6 const unsigned int MAX_DIST = 23200;
7
8 void setup(){
9
10 // The Trigger pin will tell the sensor to range find
11 pinMode(TRIG_PIN, OUTPUT);
12 digitalWrite(TRIG_PIN, LOW);
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;
```
- Simulation:** The sensor is shown at a distance of 2cm. The output text displays:

```
***
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:

- Code (sketch.ino):** The code is identical to the top screenshot.
- Simulation:** The sensor is shown at a distance of 2.00cm. The output text displays:

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



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