

## ASSIGNMENT 4

DATE	03 November 2022
TEAM ID	PNT2022TMID41116
PROJECT	IOT Based Safety Gadgets For Child Safety Monitoring and Notification
MAXIMUM MARKS	2 marks

**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.**

```
/*
 * Ultrasonic.cpp
 *
 * Library for Ultrasonic Ranging Module in a minimalist way
 *
 */

#if ARDUINO >= 100
  #include <Arduino.h>
#else
  #include <WProgram.h>
#endif

#include "Ultrasonic.h"

Ultrasonic::Ultrasonic(uint8_t trigPin, uint8_t echoPin, unsigned long timeOut) {
  trig = trigPin;
  echo = echoPin;
  threePins = trig == echo ? true :
false;      pinMode(trig, OUTPUT);
  pinMode(echo, INPUT);
  timeout = timeOut;
}

      unsigned int Ultrasonic::timing() {    if (threePins)
pinMode(trig, OUTPUT);

      digitalWrite(trig, LOW);    delayMicroseconds(2);
digitalWrite(trig, HIGH);    delayMicroseconds(10);    digitalWrite(trig, LOW);

if (threePins)

pinMode(trig, INPUT);
```

```

        previousMicros = micros();
        while(!digitalRead(echo) && (micros() - previousMicros) <= timeout); // wait
        for the echo pin HIGH or timeout    previousMicros = micros();
        while(digitalRead(echo) && (micros() - previousMicros) <= timeout); // wait for
        the echo pin LOW or timeout

                                return micros() - previousMicros; // duration
    }

    /*
    * If the unit of measure is not passed as a parameter,          * sby default, it will return the
    distance in centimeters.
    * To change the default, replace CM by INC.
    */
    unsigned int Ultrasonic::read(uint8_t und) {
        return timing() / und / 2; //distance by divisor
    }

    /*
    * This method is too verbal, so, it's deprecated.
    * Use read() instead.
    */
    unsigned int Ultrasonic::distanceRead(uint8_t und) {
        return read(und);
    }
    /*
    * Ultrasonic.h
    *
    * Library for Ultrasonic Ranging Module in a minimalist way
    *
    */

    #ifndef Ultrasonic_h
    #define Ultrasonic_h

    /*
    * Values of divisors
    */
    #define CM 28
    #define INC 71

```

```

class Ultrasonic {
public:
    Ultrasonic(uint8_t sigPin) : Ultrasonic(sigPin, sigPin) {};
    Ultrasonic(uint8_t trigPin, uint8_t echoPin, unsigned long timeOut = 20000UL);
    unsigned int read(uint8_t und = CM);
    unsigned int distanceRead(uint8_t und = CM) __attribute__((deprecated ("This
method is deprecated, use read() instead.")));          void
setTimeout(unsigned long timeOut) {timeout = timeOut;}      void
setMaxDistance(unsigned long dist) {timeout = dist*CM*2;}

```

private:

```

    uint8_t trig;
    uint8_t echo;          boolean
    threePins = false;     unsigned long
    previousMicros;        unsigned long
    timeout;               unsigned int timing();
};

```

```

#endif // Ultrasonic_h

{
    "version": 1,
    "author": "Rozen Berg",
    "editor": "wokwi",
    "parts": [
        {
            "type": "wokwi-arduino-uno",
            "id": "uno",
            "top": 259.31,
            "left": 31.06,
            "rotate": 0,
            "hide": false,
            "attrs": {}
        },
        {
            "type": "wokwi-hc-sr04",
            "id": "ultrasonic",
            "top": 86.99,
            "left": 109.89,
            "rotate": 0,
            "hide": false,
            "attrs": { "distance": "100"
        } }
    ],

```

```

    "connections": [
      [ "uno:GND.1", "ultrasonic:GND", "black", [ "v-8", "*", "v8" ] ],
      [ "uno:13", "ultrasonic:ECHO", "green", [] ],
      [ "uno:12", "ultrasonic:TRIG", "purple", [ "*", "v4" ] ],
      [ "uno:5V", "ultrasonic:VCC", "red", [ "v16", "h-96", "*", "v12" ] ]
    ]
  }
}

/*

  Ultrasonic Simple
  Prints the distance read by an ultrasonic sensor in
  centimeters. They are supported to four pins
  ultrasound sensors (like HC-SC04) and three pins (like
  PING))) and Seeed Studio sensors).

  The circuit:
  * * Module HR-SC04 (four pins) or PING))) (and other with
  three pins), attached to digital pins as follows: -----
-----
| HC-SC04 | Arduino | | 3 pins | Arduino |
-----
| Vcc | 5V | | Vcc | 5V |
| Trig | 12 | OR | SIG | 13 |
| Echo | 13 | | Gnd | GND |
| Gnd | GND | -----
-----

*/

#include "Ultrasonic.h"

/*
  Pass as a parameter the trigger and echo pin, respectively,
  or only the signal pin (for sensors 3 pins), like:
  Ultrasonic ultrasonic(13);
*/
Ultrasonic ultrasonic(12, 13);
int distance;

void setup() { Serial.begin(9600); }

void loop() {

  // Pass INC as a parameter to get the distance in inches
  distance = ultrasonic.read(CM);

```

```
Serial.print("Distance in CM: ");
Serial.println(distance);
```

```
distance = ultrasonic.read(INC);
```

```
Serial.print("Distance in Inches: ");
Serial.println(distance);
```

```
delay(1000);
```

```
}
```

Link: <https://woki.com/projects/346782026684170836>



