ASSIGNMENT 4

DATE	03 November 2022
TEAM ID	PNT2022TMID41134
PROJECT	SmartFarmer - IoT Enabled Smart Farming Application
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 (liek 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