

Assignment -4

Assignment Date	27 October 2022
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Maximum Marks	2 Marks

Question:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms send “alert” to ibm cloud and display in device recent events.

Code:

```
#define TRIG_PIN 6
#define ECHO_PIN 7

void setup() {
    Serial.begin(115200);
    pinMode(LED_BUILTIN, OUTPUT);
    pinMode(TRIG_PIN, OUTPUT);
    pinMode(ECHO_PIN, INPUT);
}

float readDistanceCM() {
    digitalWrite(TRIG_PIN, LOW);
    delayMicroseconds(2);
    digitalWrite(TRIG_PIN, HIGH);
    delayMicroseconds(10);
    digitalWrite(TRIG_PIN, LOW);
    int duration = pulseIn(ECHO_PIN, HIGH);
    return duration * 0.034 / 2;
}

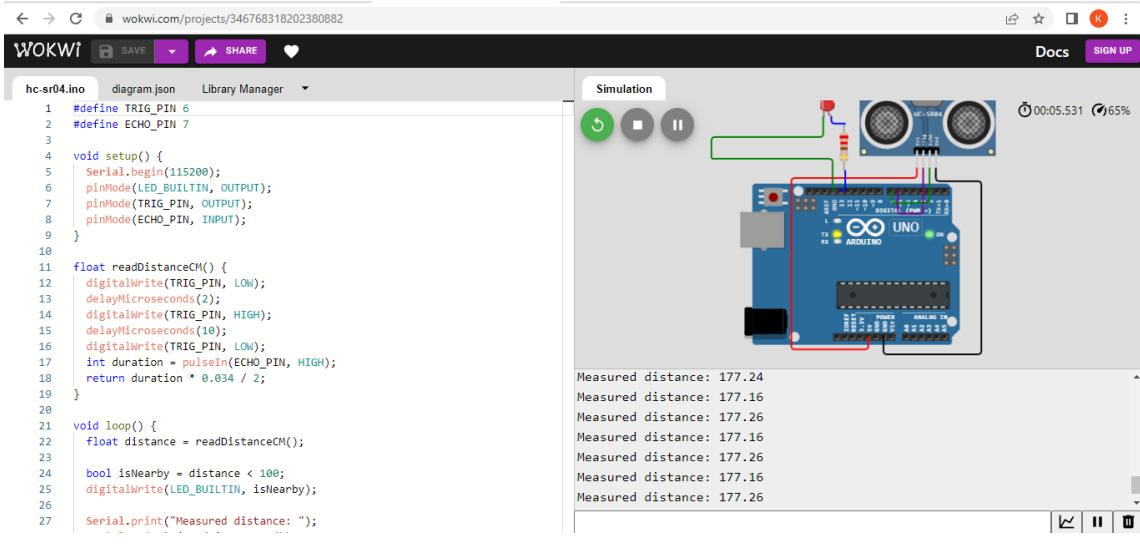
void loop() {
    float distance = readDistanceCM();

    bool isNearby = distance < 100;
    digitalWrite(LED_BUILTIN, isNearby);

    Serial.print("Measured distance: ");
    Serial.println(readDistanceCM());

    delay(100);
```

Circuit & Output:



The screenshot shows the Wokwi simulation environment. On the left, the code for `hc-sr04.ino` is displayed:

```
1 #define TRIG_PIN 6
2 #define ECHO_PIN 7
3
4 void setup() {
5     Serial.begin(115200);
6     pinMode(LED_BUILTIN, OUTPUT);
7     pinMode(TRIG_PIN, OUTPUT);
8     pinMode(ECHO_PIN, INPUT);
9 }
10
11 float readDistanceCM() {
12     digitalWrite(TRIG_PIN, LOW);
13     delayMicroseconds(2);
14     digitalWrite(TRIG_PIN, HIGH);
15     delayMicroseconds(10);
16     digitalWrite(TRIG_PIN, LOW);
17     int duration = pulseIn(ECHO_PIN, HIGH);
18     return duration * 0.034 / 2;
19 }
20
21 void loop() {
22     float distance = readDistanceCM();
23
24     bool isNearby = distance < 100;
25     digitalWrite(LED_BUILTIN, isNearby);
26
27     Serial.print("Measured distance: ");
28 }
```

The right side of the interface shows a simulation of the hardware. An Arduino Uno is connected to two HC-SR04 ultrasonic sensors. The pins are connected as follows: TRIG of the first sensor to digital pin 6 of the Arduino, ECHO of the first sensor to digital pin 7 of the Arduino, VCC of both sensors to 5V on the Arduino, GND of both sensors to GND on the Arduino, and the common ground connection to the GND pin on the Arduino. The Arduino's LED is connected to its BUILTIN pin. The simulation window displays the measured distances from the sensors:

Measured distance: 177.24
Measured distance: 177.16
Measured distance: 177.26
Measured distance: 177.16
Measured distance: 177.26
Measured distance: 177.16
Measured distance: 177.26

Reference Link:

<https://wokwi.com/projects/346768318202380882>