

Assignment -4

WOKWI

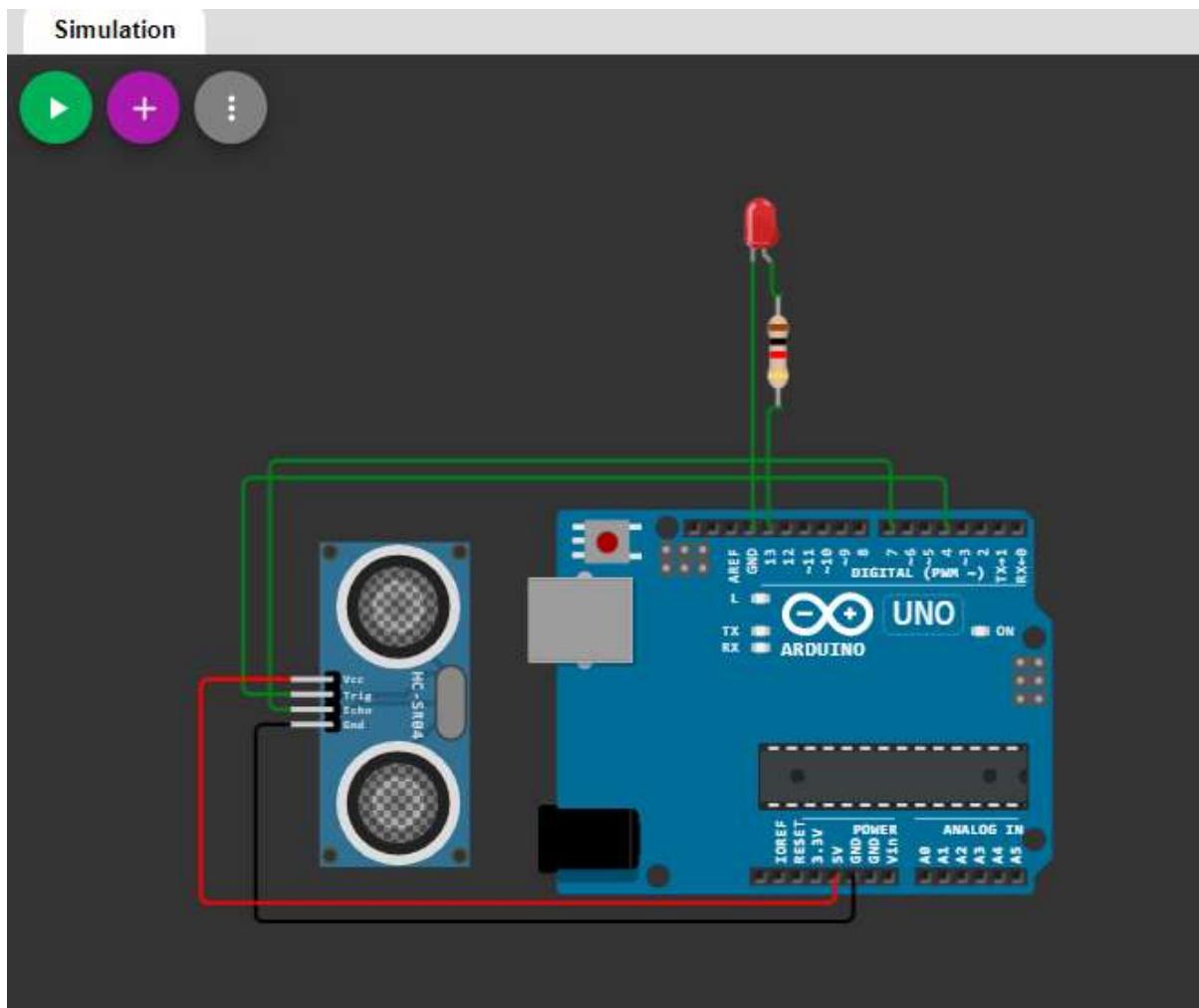
Assignment Date	28 October 2022
Student Name	MINUTHAA.S
Student Roll Number	510119106008
Maximum Marks	2 Marks

Question:

Write a code and connection in wokwi for ultrasonic sensor .whenever distance is less than 100 cms send alert

Solution:

SIMULATION

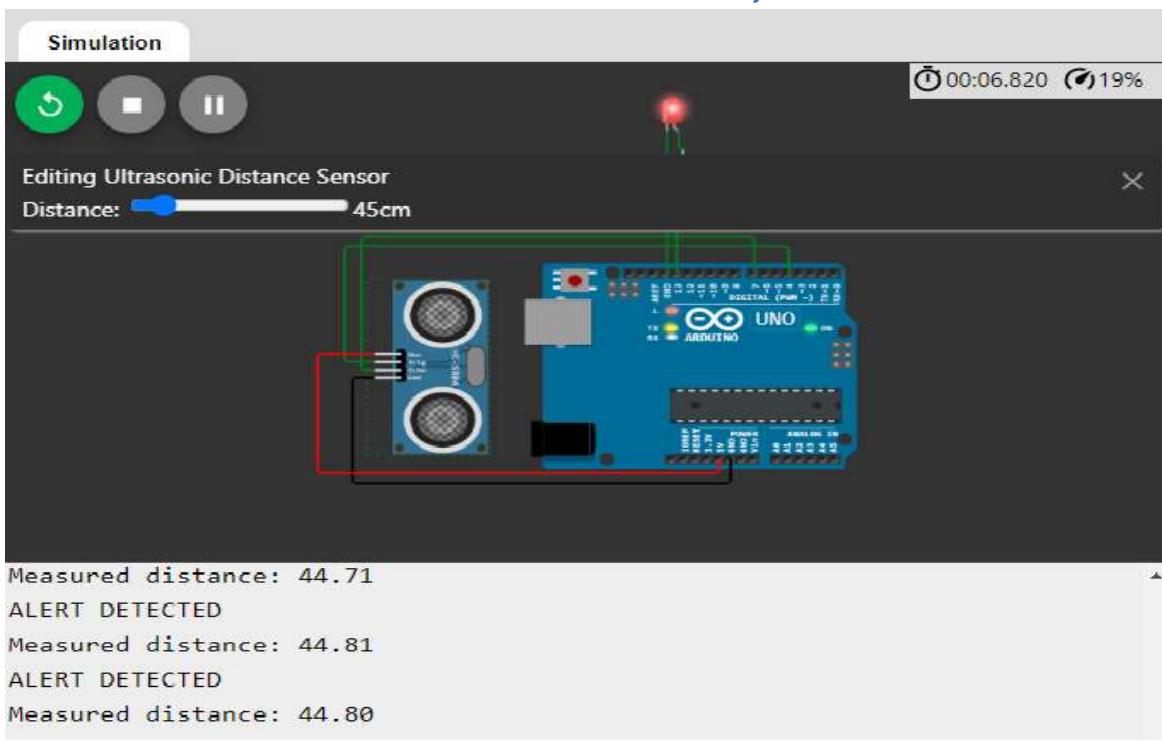


CODE

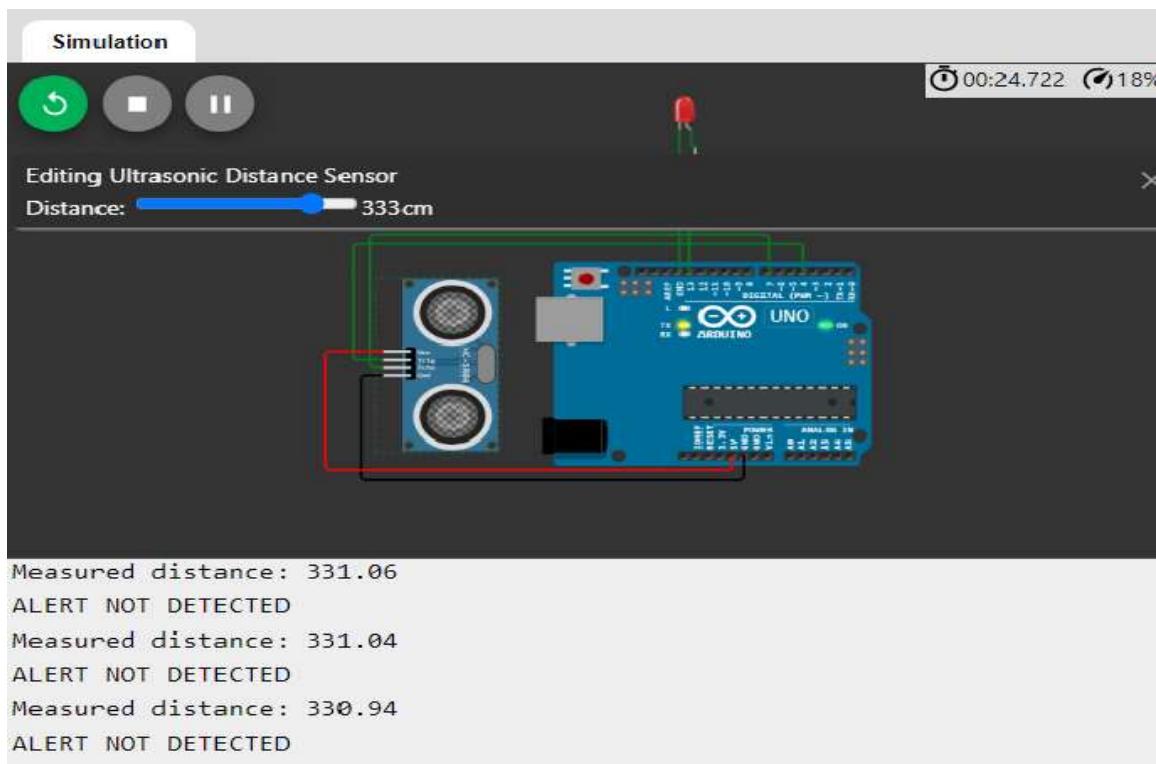
```
#define ECHO_PIN 2
#define TRIG_PIN 9
void setup() {
    Serial.begin(115200);
    pinMode(LED_BUILTIN, OUTPUT);
    pinMode(TRIG_PIN, OUTPUT);
    pinMode(ECHO_PIN, INPUT);
}
float readDistanceCM() {
    digitalWrite(TRIG_PIN, LOW);
    delay(2);
    digitalWrite(TRIG_PIN, HIGH);
    delay(10);
    digitalWrite(TRIG_PIN, LOW);
    int duration = pulseIn(ECHO_PIN, HIGH);
    return duration * 0.034 / 2;
}
void loop() {
    float distance = readDistanceCM();
    if (distance < 100){
        bool isNearby = distance < 100;
        digitalWrite(LED_BUILTIN, isNearby);
        Serial.println("ALERT DETECTED ");
        Serial.print("Measured distance: ");
        Serial.println(readDistanceCM());
        delay(100);
    }
    else {
        bool isNearby = distance > 100;
        digitalWrite(LED_BUILTIN, LOW);
        Serial.println("ALERT NOT DETECTED");
        Serial.print("Measured distance: ");
        Serial.println(readDistanceCM());
        delay(100);
    }
}
```

OUTPUT

When it reaches less than 100 cm , alert is detected



When the distance is greater than 100 cm , alert is not detected



PROGRAM AND OUTPUT

The screenshot shows the Wokwi simulation environment. On the left is the Arduino IDE-style code editor with the following C++ code:

```
1 #define ECHO_PIN 7
2 #define TRIG_PIN 4
3 void setup() {
4     Serial.begin(115200);
5     pinMode(LED_BUILTIN, OUTPUT);
6     pinMode(TRIG_PIN, OUTPUT);
7     pinMode(ECHO_PIN, INPUT);
8 }
9 float readDistanceCM() {
10    digitalWrite(TRIG_PIN, LOW);
11    delay(2);
12    digitalWrite(TRIG_PIN, HIGH);
13    delay(10);
14    digitalWrite(TRIG_PIN, LOW);
15    int duration = pulseIn(ECHO_PIN, HIGH);
16    return duration * 0.034 / 2;
17 }
18 void loop() {
19     float distance = readDistanceCM();
20     if (distance < 100){
21         bool isNearby = distance < 100;
22         digitalWrite(LED_BUILTIN, isNearby);
23         Serial.println("ALERT DETECTED ");
24         Serial.print("Measured distance: ");
25         Serial.println(readDistanceCM());
26         delay(100);
27     }
28     else {
29     }
30 }
```

The middle section shows a breadboard-based circuit with an Arduino Uno. A red wire connects pin 4 (TRIG) to a 10k pull-down resistor, which is connected to ground. Pin 4 also connects to the trig pin of a HC-SR04 ultrasonic sensor. The echo pin of the sensor connects to pin 7 (ECHO). Pin 7 connects to a 10k pull-up resistor, which is connected to 5V. The other end of the pull-up resistor connects to the digital 13 pin (LED_BUILTIN). The LED_BUILTIN pin is also connected to ground through a 220Ω resistor.

The right side shows the serial monitor output:

```
Measured distance: 86.50
ALERT DETECTED
Measured distance: 86.50
ALERT DETECTED
Measured distance: 86.50
ALERT DETECTED
Measured distance: 86.50
```

REFERENCE LINK

<https://wokwi.com/projects/346757092672012882>