

Assignment 4

DATE	31 OCTOBER 2022
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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.

Program code:

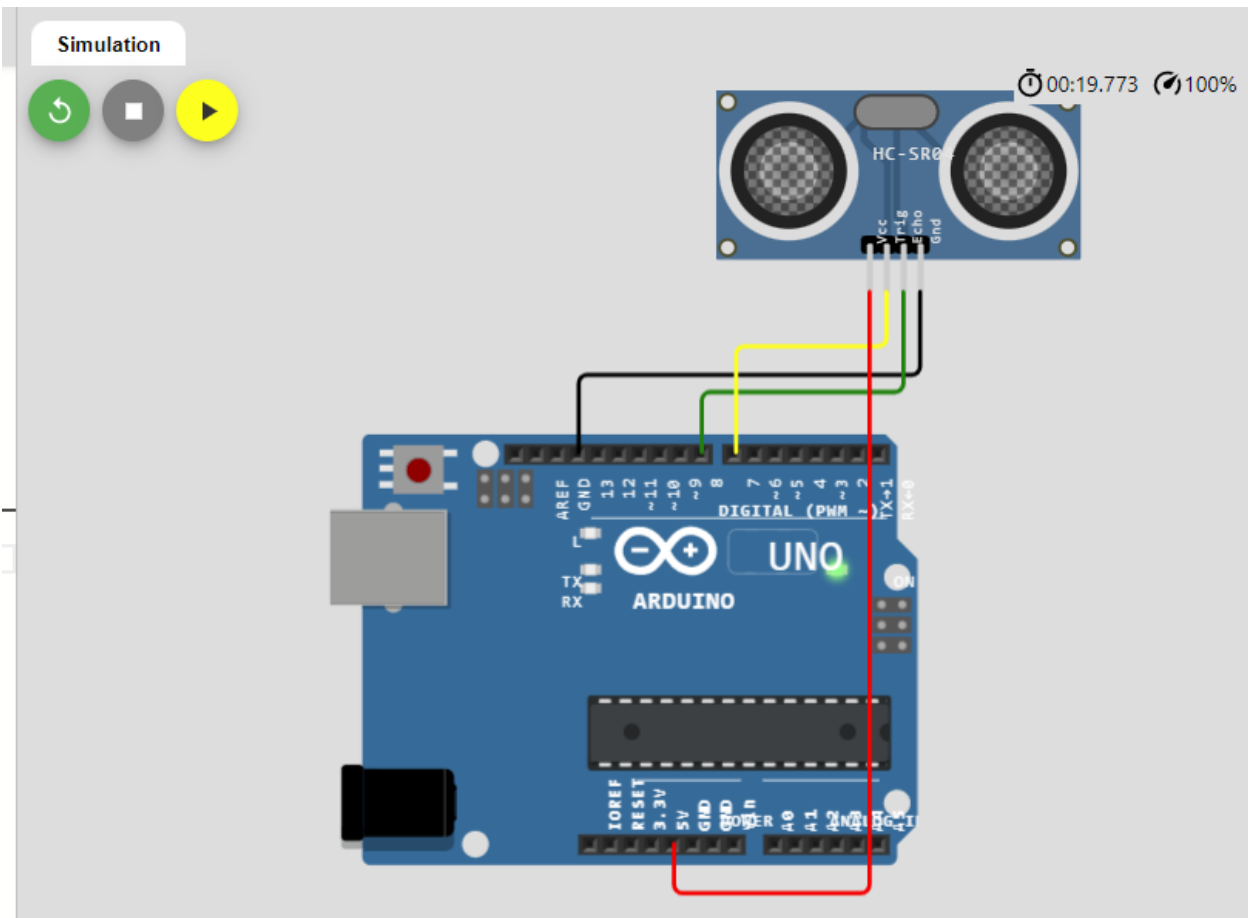
```
const int TRIG_PIN = 7 ;
const int ECHO_PIN = 8;
const unsigned int MAX_DIST = 23200;
void setup()
{
    pinMode(TRIG_PIN, OUTPUT);
    digitalWrite(TRIG_PIN, LOW);
    pinMode(ECHO_PIN, INPUT ) ;
    Serial.begin(9600);
}
void loop()
{
    unsigned long t1;
    unsigned long t2;
    unsigned long pulse_width;
    float cm;
    float inches;
    digitalWrite(TRIG_PIN, HIGH);
    delayMicroseconds(10);
    digitalWrite(TRIG_PIN, LOW);
    while (digitalRead( ECHO_PIN )==0 );
    t1= micros ();
    while (digitalRead(ECHO_PIN) == 1);
    t2= micros ();
    pulse_width = t2-t1;
    cm=pulse_width / 58 ;
    inches = pulse_width/148.0;
    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 )
  {
    Serial.println("Alert!!");
  }
  Serial.print("*****");
}
delay(1000);
}

```

Circuit:



Output:

The screenshot displays a simulation window titled "Simulation". At the top right, a timer shows "00:19.773" and a refresh icon with "100%". Below the title bar, there are three circular buttons: a green one with a circular arrow, a grey one with a square, and a yellow one with a play triangle. To the right of these buttons is a small image of a blue robot with two wheels and a sensor labeled "HC-SR04".

A dark grey dialog box titled "Editing Ultrasonic Distance Sensor" is open, showing a "Distance:" slider set to "400cm".

The main text area of the simulation shows the following output:

```
*****
The Measured Distance in cm: 45.00
Alert!!
*****
The Measured Distance in cm: 45.00
Alert!!
*****
The Measured Distance in cm: 102.00
*****
The Measured Distance in cm: 102.00
*****Out of range
```

At the bottom right of the simulation window, there are three icons: a line graph, a play button, and a trash can. Below the simulation window, there is a "Show all" button with a close icon (X).

The system tray at the bottom right shows the time "9:54 AM" and the date "10/31/2022".

Wokwi code:

```
sketch.ino • diagram.json • Library Manager ▼

1  const int TRIG_PIN = 7 ;
2  const int ECHO_PIN = 8;
3  const unsigned int MAX_DIST = 23200;
4  void setup()
5  {
6    pinMode(TRIG_PIN, OUTPUT);
7    digitalWrite(TRIG_PIN, LOW);
8    pinMode(ECHO_PIN, INPUT ) ;
9    Serial.begin(9600);
10 }
11 void loop()
12 {
13   unsigned long t1;
14   unsigned long t2;
15   unsigned long pulse_width;
16   float cm;
17   float inches;
18   digitalWrite(TRIG_PIN, HIGH);
19   delayMicroseconds(10);
20   digitalWrite(TRIG_PIN, LOW);
21   while (digitalRead( ECHO_PIN )!=0 );
22   t1= micros ();
23   while (digitalRead(ECHO_PIN) == 1);
24   t2= micros ();
25   pulse_width = t2-t1;
26   cm=pulse_width / 58 ;
27   inches = pulse_width/148.0;
28   if (pulse_width >MAX_DIST )
29   {
30     Serial.println("Out of range");
31   }
32   else
33   {
34     Serial.println("*****");
35     Serial.print("The Measured Distance in cm: ");
36     Serial.println(cm);
37     if( cm < 100 )
38     {
39       Serial.println("Alert!!");
40     }
41     Serial.print("*****");
42   }
43   delay(1000);
44 }
45
```