

SMART SOLUTION FOR WASTE MANAGEMENT

ASSIGNMENT-4

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|-----------------|------------------------|
| Date | 10 November2022 |
| Team ID | PNT2022TMID37903 |
| Student Name | Yuvan Shankar Raja.M.G |
| Student Roll.No | 410819106005 |

QUESTION:

Write Code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cm send "Alert" to IBM cloud and display in device recent events.

CODING:

```
#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 Trig =12;

int Echo = 13;

int distance;

void setup() {

  pinMode(Trig , OUTPUT);

  pinMode(Echo, INPUT );

  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);

  delay (1000);

  if (distance <100)

  {

    Serial.println("Alert");

    delay(1000);

  }

  else

  {

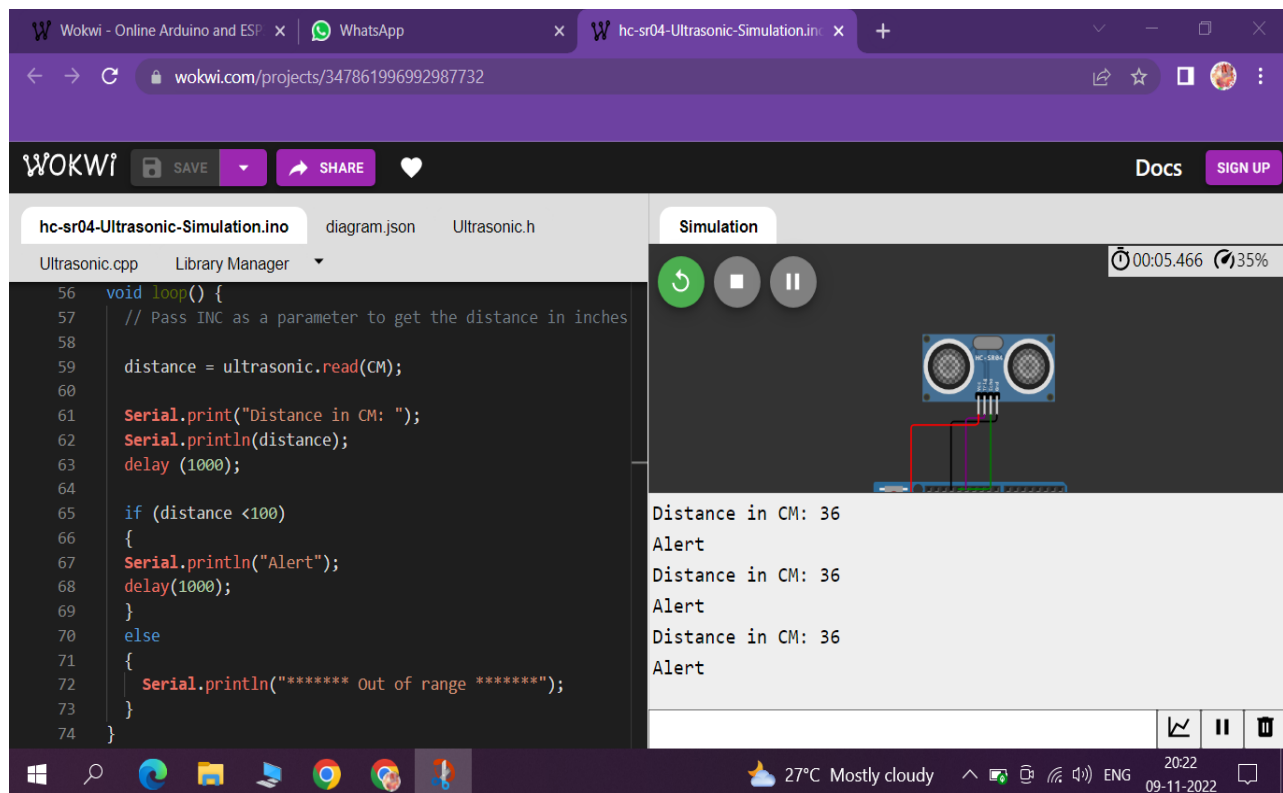
    Serial.println("*** Out of range ***");

  }

}
```

CASE 1: Distance less than 100cm

It Alerts



The screenshot displays the Wokwi online Arduino IDE interface. The browser tabs at the top include 'Wokwi - Online Arduino and ESP', 'WhatsApp', and 'hc-sr04-Ultrasonic-Simulation.ino'. The address bar shows the URL 'wokwi.com/projects/347861996992987732'. The Wokwi logo and navigation buttons (SAVE, SHARE, Docs, SIGN UP) are visible in the header.

The main workspace is divided into two panes. The left pane, titled 'hc-sr04-Ultrasonic-Simulation.ino', contains the following C++ code:

```
56 void loop() {
57   // Pass INC as a parameter to get the distance in inches
58
59   distance = ultrasonic.read(CM);
60
61   Serial.print("Distance in CM: ");
62   Serial.println(distance);
63   delay (1000);
64
65   if (distance <100)
66   {
67     Serial.println("Alert");
68     delay(1000);
69   }
70   else
71   {
72     Serial.println("***** Out of range *****");
73   }
74 }
```

The right pane, titled 'Simulation', shows a 3D model of an HC-SR04 ultrasonic sensor connected to an Arduino Uno. The simulation controls (play, stop, reset) and a timer (00:05.466) and battery level (35%) are visible. Below the simulation, the output window displays the following text:

```
Distance in CM: 36
Alert
Distance in CM: 36
Alert
Distance in CM: 36
Alert
```

The Windows taskbar at the bottom shows the system clock as 20:22 on 09-11-2022, with a weather forecast of 27°C Mostly cloudy.

CASE 2: Distance more than 100cm

It won't Alert

The screenshot displays the Wokwi online Arduino IDE interface. The left pane shows the C++ code for an HC-SR04 ultrasonic sensor simulation. The code defines a `loop()` function that reads the distance in centimeters using `ultrasonic.read(CM)`. It prints the distance and includes a 1000ms delay. An `if` statement checks if the distance is less than 100cm; if true, it prints "Alert" and delays for 1000ms. Otherwise, it prints "***** Out of range *****".

```
56 void loop() {
57   // Pass INC as a parameter to get the distance in inches
58
59   distance = ultrasonic.read(CM);
60
61   Serial.print("Distance in CM: ");
62   Serial.println(distance);
63   delay (1000);
64
65   if (distance < 100)
66   {
67     Serial.println("Alert");
68     delay(1000);
69   }
70   else
71   {
72     Serial.println("***** Out of range *****");
73   }
74 }
```

The right pane shows the simulation of the HC-SR04 sensor module. Below the simulation window, the serial output is displayed, showing the following sequence of events:

```
Distance in CM: 291
***** Out of range *****
Distance in CM: 292
***** Out of range *****
Distance in CM: 291
***** Out of range *****
Distance in CM: 292
```

The output confirms that the measured distances (291cm and 292cm) are greater than the 100cm threshold, resulting in "Out of range" messages instead of an alert.