

Assignment - 4

Assignment Date	27 October 2022
Student Name	J P HELEN SOFFIA
Student Roll Number	95071914032
Maximum Marks	2 Marks

Question-1:

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.

Solution:

```
// Pins
const int TRIG_PIN = 7; const int
ECHO_PIN = 8;

// Anything over 400 cm (23200 us pulse) is "out of range"
const unsigned int MAX_DIST = 23200; void setup() {

  // The Trigger pin will tell the sensor to range find pinMode(TRIG_PIN,
  OUTPUT);
  digitalWrite(TRIG_PIN, LOW);

  //Set Echo pin as input to measure the duration of
  //pulses coming back from the distance sensor pinMode(ECHO_PIN,
  INPUT);

  // We'll use the serial monitor to view the sensor output Serial.begin(9600); }
void loop()

{

  unsigned long t1; unsigned
  long t2; unsigned long
  pulse_width; float cm;
  float inches;

  // Hold the trigger pin high for at least 10 us
```

```

digitalWrite(TRIG_PIN,
HIGH); delayMicroseconds(10);
digitalWrite(TRIG_PIN, LOW);

// Wait for pulse on echo pin while ( digitalRead(ECHO_PIN) ==
0 );

// Measure how long the echo pin was held high (pulse width)
// Note: the micros() counter will overflow after ~70 min t1 =
micros();
while ( digitalRead(ECHO_PIN) == 1);
t2 = micros(); pulse_width = t2 - t1;

// Calculate distance in centimeters and inches. The constants // are
found in the datasheet, and calculated from the assumed speed //of
sound in air at sea level (~340 m/s). cm = pulse_width / 58.0;
inches = pulse_width / 148.0;

// Print out results
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){
// while(true){
Serial.println("Alert!!");
// } }

Serial.print("*****"); }

// Wait at least 1000ms before next measurement delay(1000);
}

```

Output:

1) If the distance is less than 100 cms , it alerts.

The screenshot shows the Wokwi simulation environment. On the left, the code for 'hc-sr04.ino' is displayed. The code sets up an Arduino Uno with an HC-SR04 ultrasonic sensor. The trigger pin is 7 and the echo pin is 8. A constant MAX_DIST is set to 23200. The setup function configures the trigger pin as an output and the echo pin as an input. The loop function measures the distance and prints it to the serial monitor. The simulation window on the right shows the sensor connected to the Arduino. A small window titled 'Editing Ultrasonic Distance Sensor' shows a distance of 83cm. The serial monitor output shows: '***** The Measured Distance in cm : 84.14 Alert!! *****'. The simulation is running at 58% speed.

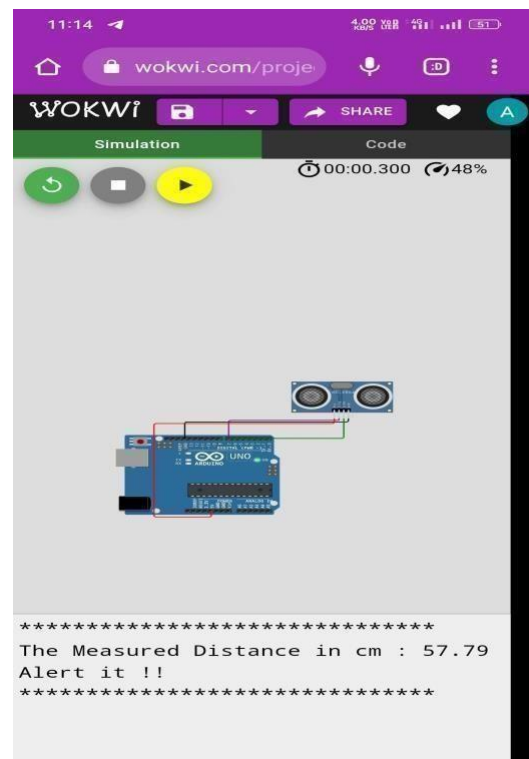
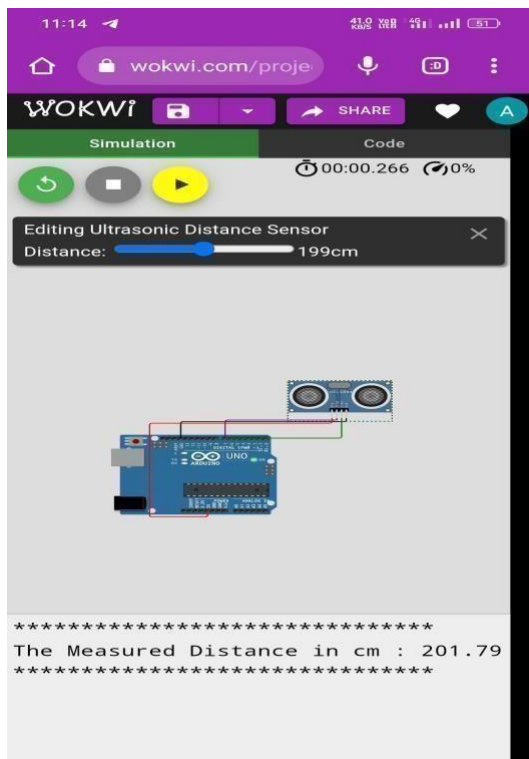
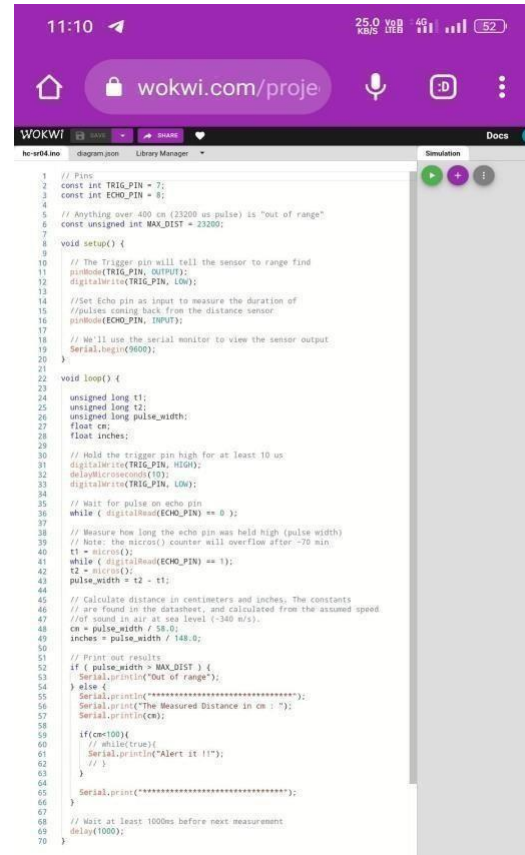
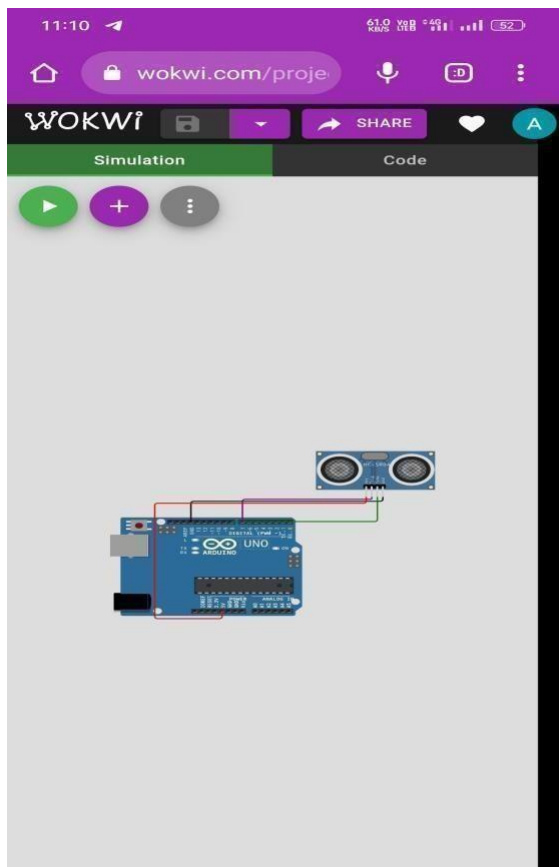
```
1 // Pins
2 const int TRIG_PIN = 7;
3 const int ECHO_PIN = 8;
4
5 // Anything over 400 cm (23200 us pulse) is "out of range"
6 const unsigned int MAX_DIST = 23200;
7
8 void setup() {
9
10 // The Trigger pin will tell the sensor to range find
11 pinMode(TRIG_PIN, OUTPUT);
12 digitalWrite(TRIG_PIN, LOW);
13
14 //Set Echo pin as input to measure the duration of
15 //pulses coming back from the distance sensor
16 pinMode(ECHO_PIN, INPUT);
17
18 // We'll use the serial monitor to view the sensor output
19 Serial.begin(9600);
20 }
21
22 void loop() {
23
24 unsigned long t1;
25 unsigned long t2;
26 unsigned long pulse_width;
27 float cm;
28 float inches;
29
30 // Hold the trigger pin high for at least 10 us
```

2) If the distance is more than 100 cms, it won't alert.

The screenshot shows the Wokwi simulation environment. On the left, the code for 'hc-sr04.ino' is displayed. The code is identical to the first screenshot. The simulation window on the right shows the sensor connected to the Arduino. The serial monitor output shows: '***** The Measured Distance in cm : 227.10 *****'. The simulation is running at 62% speed.

```
1 // Pins
2 const int TRIG_PIN = 7;
3 const int ECHO_PIN = 8;
4
5 // Anything over 400 cm (23200 us pulse) is "out of range"
6 const unsigned int MAX_DIST = 23200;
7
8 void setup() {
9
10 // The Trigger pin will tell the sensor to range find
11 pinMode(TRIG_PIN, OUTPUT);
12 digitalWrite(TRIG_PIN, LOW);
13
14 //Set Echo pin as input to measure the duration of
15 //pulses coming back from the distance sensor
16 pinMode(ECHO_PIN, INPUT);
17
18 // We'll use the serial monitor to view the sensor output
19 Serial.begin(9600);
20 }
21
22 void loop() {
23
24 unsigned long t1;
25 unsigned long t2;
26 unsigned long pulse_width;
27 float cm;
28 float inches;
29
30 // Hold the trigger pin high for at least 10 us
```

3) Simulation and code execution



Project Link:

<https://wokwi.com/projects/348501529414599252>