

Assignment - 4

Assignment Date	22 October 2022
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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!!");
// } }

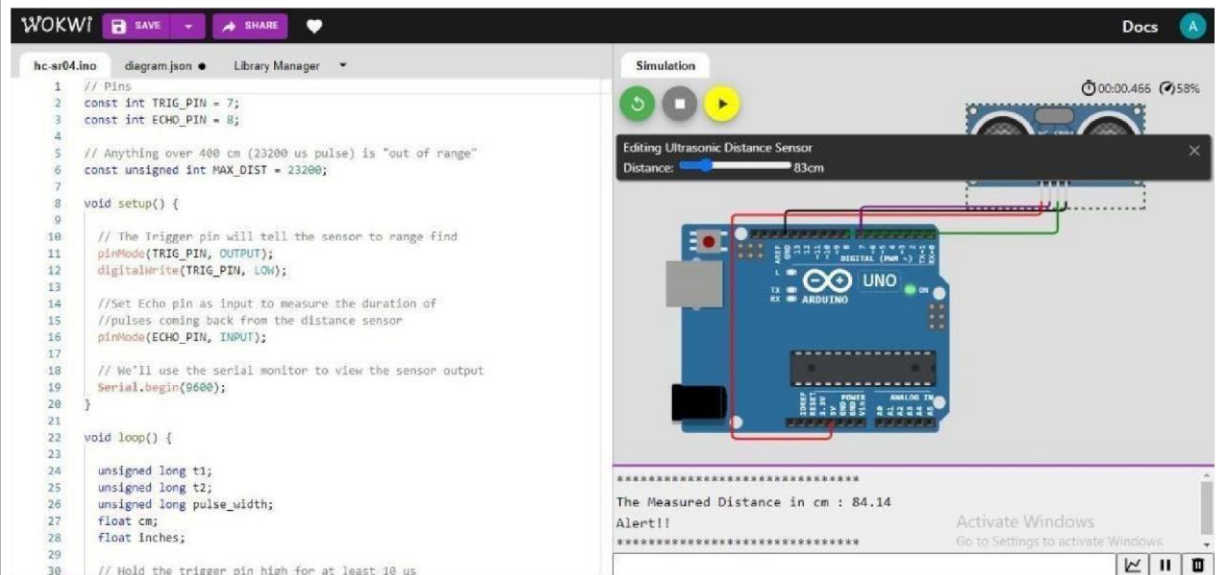
Serial.print("*****"); }

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

```

Output:

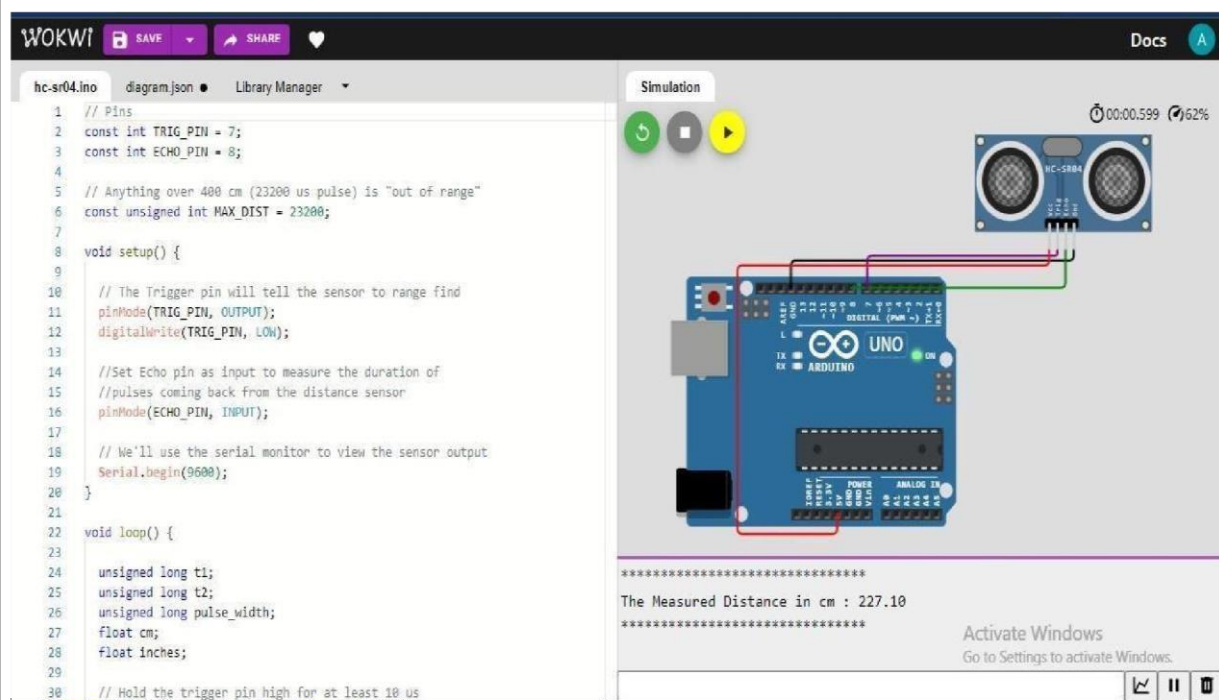
1) If the distance is less than 100 cms , it alerts.



The screenshot shows the Wokwi simulation interface. On the left, the code for `hc-sr04.ino` is displayed. The code defines pins for the trigger and echo, sets up the sensor, and measures the distance. The right side shows the simulation of an Arduino Uno with an HC-SR04 sensor connected. A dialog box indicates the distance is 83cm. The serial monitor output shows: "The Measured Distance in cm : 84.14" and "Alert!!".

```
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
```

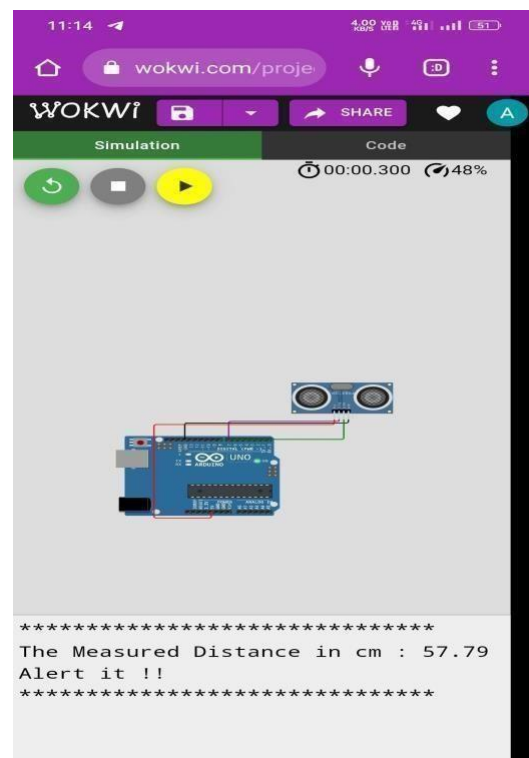
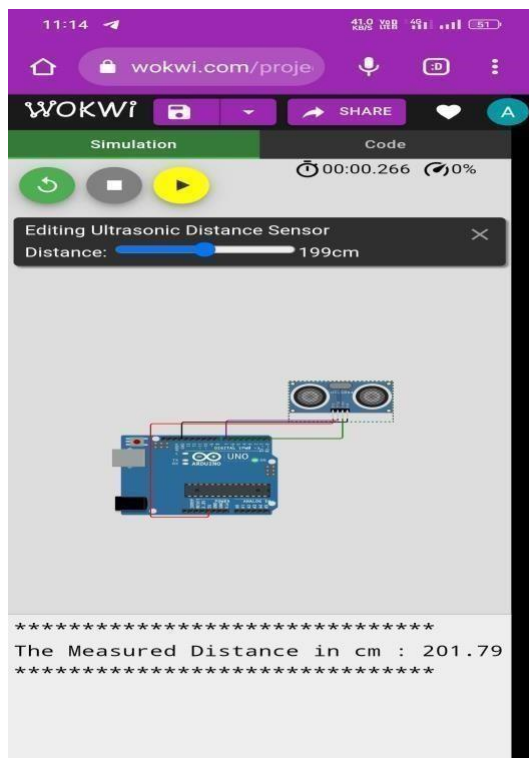
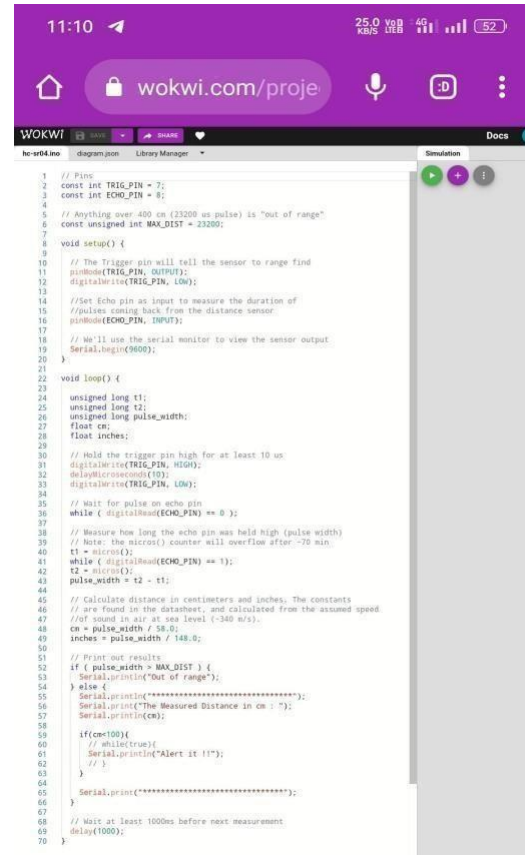
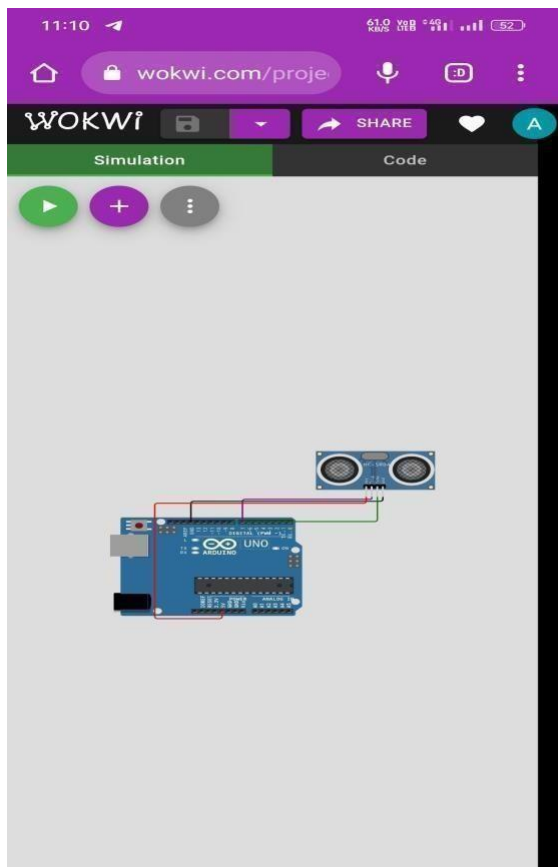
2) If the distance is more than 100 cms, it won't alert.



The screenshot shows the Wokwi simulation interface. On the left, the code for `hc-sr04.ino` is displayed. The code defines pins for the trigger and echo, sets up the sensor, and measures the distance. The right side shows the simulation of an Arduino Uno with an HC-SR04 sensor connected. A dialog box indicates the distance is 227.10cm. The serial monitor output shows: "The Measured Distance in cm : 227.10".

```
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:

[sketch.ino - Wokwi Arduino and ESP32 Simulator](#)