Assignment - 4

Assignment Date	22 October 2022
Student Name	Poovarasan N
Student Roll Number	732719106018
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);
```

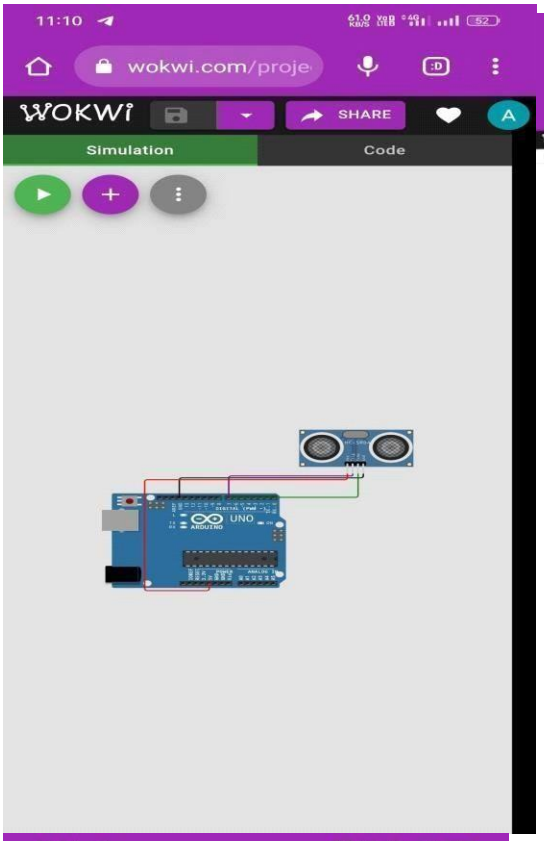
```
    if(cm<100){
      // while(true){
      Serial.println("Alert!!");
      // }
    }

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

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

Output:

- **If the distance is less than 100 cms , it alerts.**

- **If the distance is more than 100 cms, it won’t alert.**

- **Simulation and code execution**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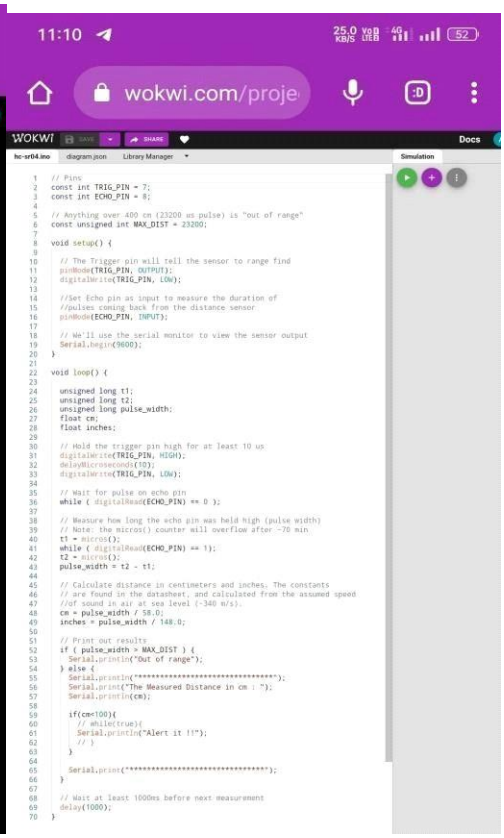
WOKWI
SHARE
Simulation
Code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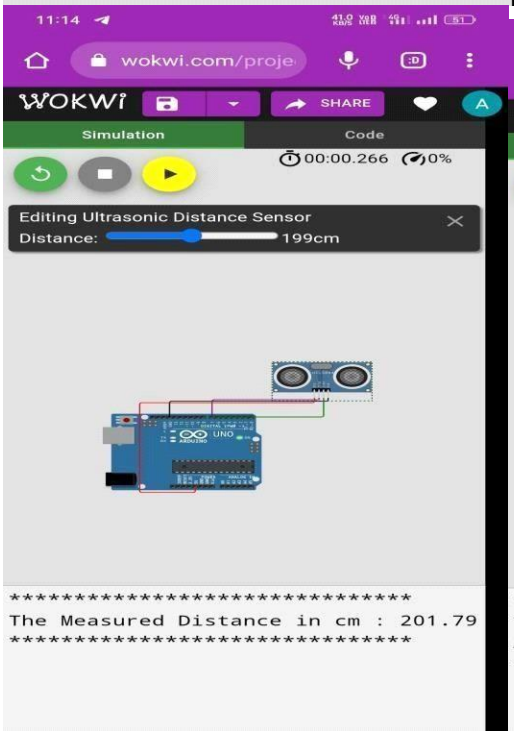
wokwi.com/proje
WOKWI
SHARE
Docs
hc-sr04.ino
diagram.json
Library Manager
Simulation
// Pins
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;
// Anything over 400 cm (23200 us pulse) is "out of range"
const unsigned int MAX_DIST = 23200;
void setup() {
// The Trigger pin will tell the sensor to range 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 it !!");
// }
}
Serial.print("********************************");
}
// Wait at least 1000ms before next measurement
delay(1000);
}


11:14
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WOKWI
SHARE
Simulation
Code
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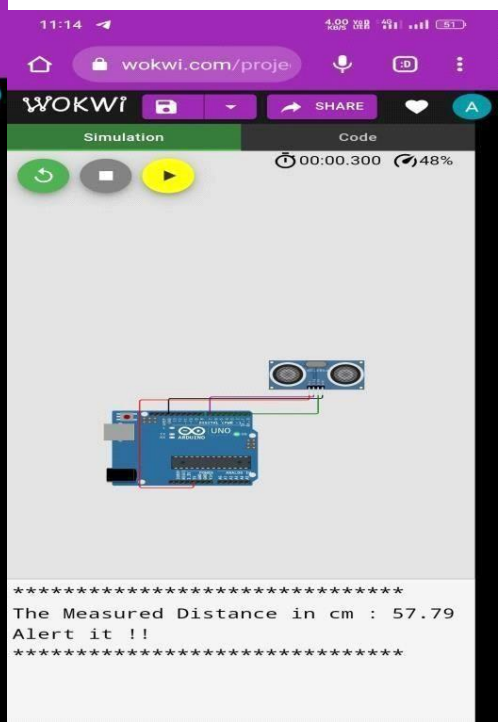
0%
Editing Ultrasonic Distance Sensor
Distance:
199cm
****
The Measured Distance in cm : 201.79
****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WOKWI
SHARE
Simulation
Code
00:00.300
48%
****
The Measured Distance in cm : 57.79
Alert it !!
****

Project Link:

https://wokwi.com/projects/346136429340918356