

ASSIGNMENT-4

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```
1 // ARDUINO PINS (TRIGGER PIN, ECHO PIN)
2 const int TRIG_PIN = 7;
3 const int ECHO_PIN = 8;
4 // Anything over 400 cm (23200 us pulse) is "out of range"
5 const unsigned int max_dist = 23200;
6 void setup() {
7   // The Trigger pin will tell the sensor to range find
8   pinMode(TRIG_PIN, OUTPUT);
9   digitalWrite(TRIG_PIN, LOW);
10  // Set Echo pin as input to measure the time duration of pulse returning back from the dis
11  sensor
12  pinMode(ECHO_PIN, INPUT);
13  // We'll use the serial monitor to view the sensor output
14  Serial.begin(9600);
15 }
16 void loop() {
17   unsigned long t1;
18   unsigned long t2;
19   unsigned long pulse_width;
20   float cm;
21   float inches;
22   // Hold the trigger pin high for at least 10 us
23   digitalWrite(TRIG_PIN, HIGH);
24   delayMicroseconds(10);
25   digitalWrite(TRIG_PIN, LOW);
26   // Wait for pulse on echo pin
27   while ( digitalRead(ECHO_PIN) == 0 );
28   // Measure how long the echo pin was held high (pulse width)
29   // Note: the micros() counter will overflow after ~70 min
30   t1 = micros();
```

Simulation

Code:

```
// ARDUINO PINS (TRIGGER PIN, ECHO PIN)

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 time duration of pulse returning 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("Distance Measured (cm) : ");
  Serial.println(cm);
  if(cm<100){
    // while(true){
    Serial.println("Alert!!!");
    // }
  }
  Serial.print("*****");
}
// Wait at least 1000ms before next measurement
delay(1000);
}

```

Output:

Distance Measured (cm) : 2.09

Alert!!!

Distance Measured (cm) : 2.02

Alert!!!