

## Ultrasonic\_1 1/7/17

```
//The ultrasonic sensor has four pins, power, trigger and echo.
//The program displays the distance in cm on the serial monitor.

int trigPin = 7;
int echoPin = 6;
long duration;
long cm;
//A normal integer is only up to 16 bits (32,768).
//A long integer can store numbers up to 32 bits.

void setup() {
// initialize serial communication:
  Serial.begin(9600);
  pinMode(trigPin,OUTPUT);
  pinMode(echoPin,INPUT);
}

void loop() {
// The PING))) is triggered by a HIGH pulse of 2 or more microseconds.
// Give a short LOW pulse beforehand to ensure a clean HIGH pulse:
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(5);
  digitalWrite(trigPin, LOW);

//The duration counts the time in microseconds until the echo is heard.
  duration = pulseIn(echoPin, HIGH);

// convert the time into a distance
  cm = duration/59;

  Serial.print(cm);
  Serial.print("cm");
  Serial.println();
  delay(200);
}
```



speed of sound approx. 340 metres/sec

1 metre = 1/340 secs

1 metre = .002 941 1 secs

1 cm = .000 029 411 secs

1 cm = 29.411 us (microseconds)

Sound time = time to object + time to return,

so 1 cm = 29.411 x 2 us

1cm = 58.822 us

close enough to 59 us per cm.