/\* HC-SR04 Sensor

 https://www.dealextreme.com/p/hc-sr04-ultrasonic-sensor-distance-measuring-module-133696

 This sketch reads a HC-SR04 ultrasonic rangefinder and returns the

 distance to the closest object in range. To do this, it sends a pulse

 to the sensor to initiate a reading, then listens for a pulse

 to return. The length of the returning pulse is proportional to

 the distance of the object from the sensor.

 The circuit:

 \* VCC connection of the sensor attached to +5V

 \* GND connection of the sensor attached to ground

 \* TRIG connection of the sensor attached to digital pin 2

 \* ECHO connection of the sensor attached to digital pin 4

 Original code for Ping))) example was created by David A. Mellis

 Adapted for HC-SR04 by Tautvidas Sipavicius

 This example code is in the public domain.

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const int trigPin = 2;

const int echoPin = 4;

void setup() {

 // initialize serial communication:

 Serial.begin(9600);

}

void loop()

{

 // establish variables for duration of the ping,

 // and the distance result in inches and centimeters:

 long duration, inches, cm;

 // The sensor is triggered by a HIGH pulse of 10 or more microseconds.

 // Give a short LOW pulse beforehand to ensure a clean HIGH pulse:

 pinMode(trigPin, OUTPUT);

 digitalWrite(trigPin, LOW);

 delayMicroseconds(2);

 digitalWrite(trigPin, HIGH);

 delayMicroseconds(10);

 digitalWrite(trigPin, LOW);

 // Read the signal from the sensor: a HIGH pulse whose

 // duration is the time (in microseconds) from the sending

 // of the ping to the reception of its echo off of an object.

 pinMode(echoPin, INPUT);

 duration = pulseIn(echoPin, HIGH);

 // convert the time into a distance

 inches = microsecondsToInches(duration);

 cm = microsecondsToCentimeters(duration);

 Serial.print(inches);

 Serial.print("in, ");

 Serial.print(cm);

 Serial.print("cm");

 Serial.println();

 delay(100);

}

long microsecondsToInches(long microseconds)

{

 // According to Parallax's datasheet for the PING))), there are

 // 73.746 microseconds per inch (i.e. sound travels at 1130 feet per

 // second). This gives the distance travelled by the ping, outbound

 // and return, so we divide by 2 to get the distance of the obstacle.

 // See: http://www.parallax.com/dl/docs/prod/acc/28015-PING-v1.3.pdf

 return microseconds / 74 / 2;

}

long microsecondsToCentimeters(long microseconds)

{

 // The speed of sound is 340 m/s or 29 microseconds per centimeter.

 // The ping travels out and back, so to find the distance of the

 // object we take half of the distance travelled.

 return microseconds / 29 / 2;

}