The Ultrasonic Parking Siren

What is it?

New cars have this feature that helps the driver park their car without causing rather costly contact with other vehicles.

How does it work?

An ultrasonic sensor sends off a sound wave and then detects the return of the same sound wave. It uses the time travelled by the wave to calculate distance to the obstacle that reflected the wave, by this equation:

Distance (in cm) = Time (in μs) X 0.0034
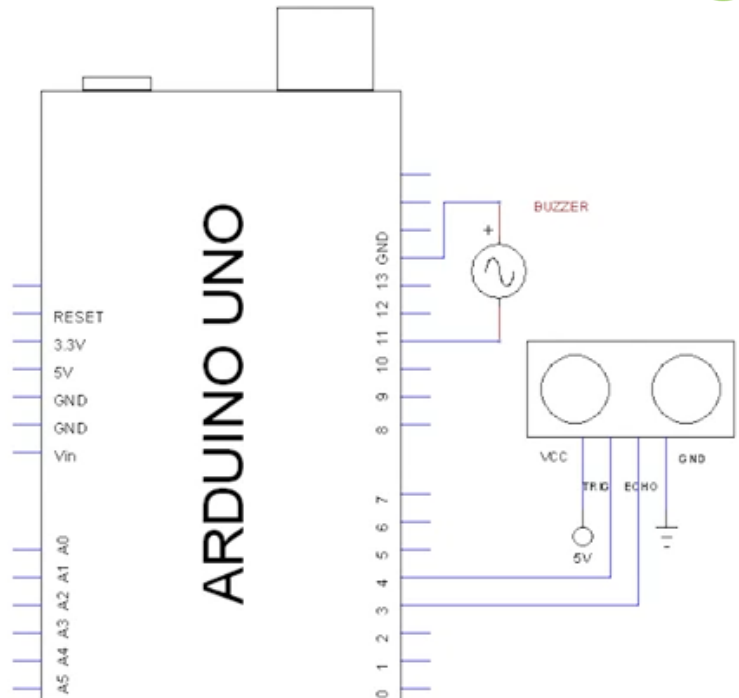
How to make it?

*Components:* breadboard, breadboard wire, Buzzer, Ultrasonic Sensor

Step 1: IMPORTANT: Make sure your Arduino is ON before assembling circuit

Step 2: FIRST Connect the GND pin on the sensor to the GND pin on the Arduino THEN connect the Vcc pin on the sensor to the 5V pin on the Arduino

Step 3: Connect the Echo pin on the sensor to Pin 3 on the Arduino

Step 4: Connect the Trig pin on the sensor to Pin 4 on the Arduino

Step 5: Load the "Ultrasonic Siren" Program and test out the siren
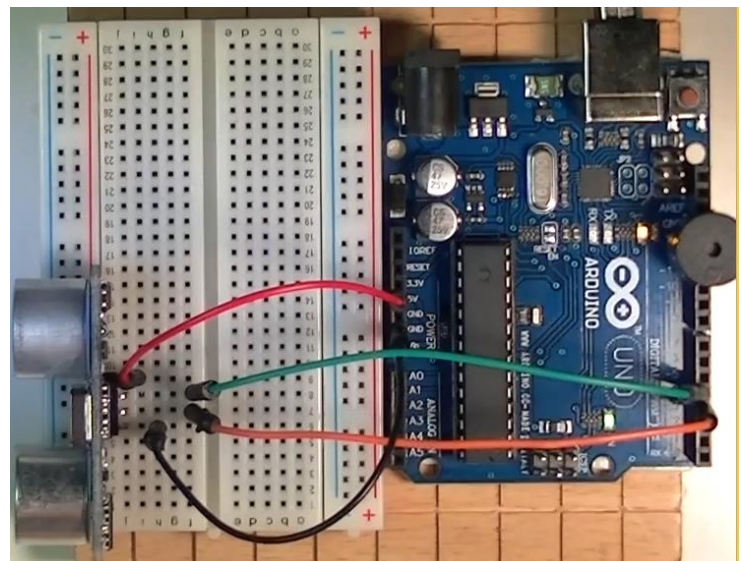
Part 2: Modifying the code

```
int sirenPin = 11;
long duration;


void setup() {
  pinMode(4,OUTPUT);   // trig pin
  pinMode (3, INPUT);   // echo pin
  pinMode (sirenPin,OUTPUT); // set the siren pin as output
  //Serial.begin(9600);   // display distance OPTIONAL
}

void loop()
{
 //*********code mesures time for the sound to bounce back from an object**********
  digitalWrite(4, HIGH); // turn on trigger
  delayMicroseconds(5);
  digitalWrite(4, LOW); //turn trigger off
  duration = pulseIn(3, HIGH); // measure time for sound wave to come back
  //Serial.print(duration/58); // converts microseconds to centrimeters //OPTIONAL
  //Serial.println("cm"); //OPTIONAL

  digitalWrite(sirenPin,HIGH);    //turn siren on
  delay(100);                     //leave on for 100 milliseconds
  digitalWrite(sirenPin,LOW);     //turn siren off
  delay(duration/3);              //leave off depending on distance
  }
```
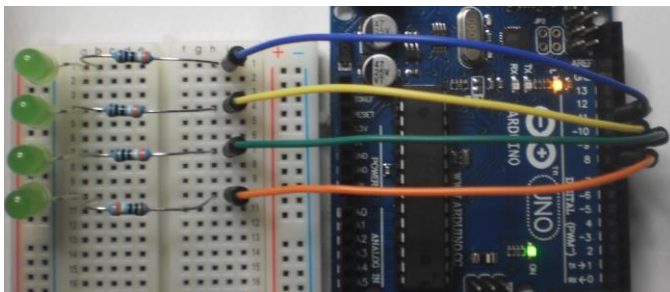
Modificiations
1. Change the delay circled in red to shorten or lengthen individual beeps of the siren
2. Change the number 3 to increase or decrease the intervals of silence between the beeps

Part 2:
1. Remove the siren and connect 4 LED's to pins 8, 9, 10, 11

2. Upload "Ultrasonic lights" program and write the code that will turn the lights on in response to the distance variable