If I was going to spend the money and time to find and research parts along with minimal code for a micro processor, I wanted it to be something useful for me and something I would buy. I own a truck that is lowered with ground effects. Since I have owned this truck, parking close as possible to the parking stops without touching them has been a problem, as my ground effects in the front of my vehicle do not clear the height of the stops. Touching them or going over the top of them either scrapes the paint, leaves gouges in the ground effects, or both. This has been a constant source of irritation. While learning about a microprocessor, what it does and can do for me, I knew I had come up with a practical solution that could be engineered, fabricated, and installed by me. The answer was something that would detect the presence of obstacles in front of my ground effects and alert me to how close I am. I chose to use the Arduino Duemilanove, an analog IR range finder, 3-wire connection harness, and an LED. While this will be the extent of parts for the class project, when I install this in my truck over the summer, the parts list will grow to include a lengthy amount of wiring, a 7805T-5V pos volt regulator, along with two more range detectors totaling three for a broader horizontal range. I chose the IR range finder after a comparison with the ultrasonic range finder. I chose the IR over the ultra sonic due to it being prone to false readings from ghost echoes if multiple objects of differing distances are in its range of detection. Since I would be parking in many different scenarios, I did not want to risk false reads. The IR sensor I purchased has a range from 4 inches to 30 inches. This sensor measures distance by emitting a beam of IR light which hits a point of reflection on an object and returns to an IR detector on the sensor forming a triangle. The adjacent angle degree, striking the IR detector (Fig. 1) is calculated and a current coinciding with the distance is sent to the micro processor. The micro processor reads this analog current signal and converts it to a digital signal controlling a LED. The farther away it reads, the faster the light flashes. The light slows in
flashing as it nears the sensor. I put two thresholds for the flashing of the LED. The LED will not
flash until an object is detected within 30 inches and will stay on in a steady state once 6 inches
or less has been reached. When an object is detected, the flashing will be very rapid to get the
drivers attention. As the distance is shortened, so too will the repetition of flashes, telling the
driver to go slower as the flash speed slows until the light stays on constant. Then the driver will
know to stop. The significance of this could be great to automobile enthusiast. Many vehicles
come from the factory with a similar option, but they are mainly big trucks and SUVs where it is
difficult due to height and distance of driver to vehicle perimeter to see how close the vehicle is
to others. If the vehicle is lowered, then the stock sensor will still be too high for ground objects
due to their location in the bumpers. Modified vehicles with aftermarket ground effect kits are
expensive, plus the labor to have them installed and painted to match the rest of the car. This
sensor would be ideal for this situation being that it is cheap and small. Also there is no drilling
or cutting of the ground effects to install it, which I know most people will not want to cut on
their kit. This sensor will help keep their expensive purchase in pristine condition. This project
could also be used to upgrade older or cheaper modeled trucks and SUVs that did not come with
a range finding option from the factory. This helps them avoid costly collisions while
maneuvering in tight conditions, such as our parking garage here on campus, with big vehicles.
A micro processor is controlling the sensor. This processor can also be used for other custom
add-ons an enthusiast would like to add to their vehicle, the options are too numerous to mention
here. This application is practical for when other people are not familiar with your vehicle or its
special considerations while driving it. For example valet drivers.
Here is the code;

/*
 * AnalogInput
 * http://www.arduino.cc/en/Tutorial/AnalogInput
 * I used the tutorial program as a beginning platform and modified it to suit me./

int potPin = 2;    // select the input pin for the potentiometer
int ledPin = 13;   // select the pin for the LED
int val = 0;       // variable to store the value coming from the sensor

void setup() {
    pinMode(ledPin, OUTPUT);  // declare the ledPin as an OUTPUT
}

void loop() {
    val = analogRead(potPin);    // read the value from the sensor
    if (val>90)digitalWrite(ledPin, HIGH);  // turn the ledPin on
    delay(val);                  // stop the program for some time
    if (val<400)digitalWrite(ledPin, LOW);  // turn the ledPin off
    delay(val);                  // stop the program for some time
}
Here are the parts involved in the project.

Here they are assembled.
This is going to be the location of the sensor. It will be concealed and have partial protection.
This is the video of me testing the project. The quality is poor, I do not have camera capable of better.

http://www.youtube.com/watch?v=CjNPIkJJ24