STAT 672, Spring 2011
Extra Practice Problems
Not to be turned in.

Show all work.

The numbers refers to *Hollander and Wolfe*, if not specified otherwise. Some problems may have additional parts.

We will use the R dataset `cars`. We will look at "smoothing" the data.

1. We will use the R function `ksmooth` and look at a running mean smoother, which is equivalent to using a `box` kernel.

(a) Make a scatter plot of the data and overlay the fitted values from the "box" kernel with the default bandwidth.

(b) Using the plot in (a), overlay the fitted values from the "box" kernel with bandwidths of 2 and 5.

(c) What do you conclude from your plot?

2. We will use the R function `ksmooth` and look at a normal kernel regression smoother.

(a) Make a scatter plot of the data and overlay the fitted values from the "normal" kernel with the default bandwidth.

(b) Using the plot in (a), overlay the fitted values from the "normal" kernel with bandwidths of 2 and 5.

(c) What do you conclude from your plot?

3. We will use the R function `smooth.spline` and look at a cubic smoothing spline.

(a) Make a scatter plot of the data and overlay the fitted values from the cubic spline with the default values. The default values will use the generalized cross-validation or GCV.

(b) What is the equivalent degree of freedom for your cubic smoothing spline in (a).

(c) There is a `predict.smooth.spline` function. Look at the help file for this function. Produce the estimated derivatives of your cubic spline fit (at your original data values). What possible use are estimated derivatives?