Math 102
Project 4 Handout
Due: By 4:00pm on Wednesday 12/10/2008

Instructions: This project is designed to give you an opportunity to explore some additional concepts from statistics and linear modeling. Complete as much of this project as you can by the due date (Wednesday December 10th). You should write up your solutions neatly and all pertinent work leading up to your solution should be included. Make sure that you show enough detail in your computations that I can see how you arrived at your answers. If you consult any references (books or on line material), cite the relevant sources either in footnotes, or at the end of your project.

1. (7 points) Find the mean, median, mode, midrange, range, and standard deviation for the price of *regular gasoline* from 1951 through 1990. Which measure of central tendency do you think gives the best description of the "middle" of this data set? Explain your reasoning.

2. For the price of *unleaded gasoline* from 1976 through 2007:

   (a) (2 points) Find the line of best fit and the correlation coefficient for this data.

   (b) (2 points) Construct a scatter plot of this data and graph the line of best fit on the same axes.

   (c) (2 points) What does the slope of the line of best fit tell you in practical terms (Hint: what units does the slope have)?

   (d) (2 points) Use the correlation coefficient to discuss the significance of the correlation between the data and line of best fit. How likely is it that this data is linearly related?

   (e) (2 points) Use the line of best fit you found to predict what the price of unleaded gasoline will be in 2020. According to your liner model, when will the price of gasoline reach $10.00 per gallon?

   (f) (2 points) How well does your linear model predict the price of gasoline toady?

   (g) (2 points) Discuss any limitations when using this model and any other problems you see with this linear model. Over what period of time do you think that it gives good information about the price of unleaded gasoline per dollar? Explain your reasoning.