1. (10 pts) You wish to better understand the pedestrian traffic there is on campus.

   (a) (5 pts) Create a precise problem statement that is simple enough for you to be able to model.

   (b) (5 pts) List at least five assumptions or simplifications you would make in order to model your problem statement from part (a).

2. (10 pts) Suppose you have a large set of data that appears to satisfy exponential growth.

   (a) (4 pts) Write a paragraph that explains at least two different reasons why it might be justified to do a **visual** function fit instead of a **regression** fit.

   (b) (6 pts) Give the necessary steps in order to perform the visual fit. Explain the steps clearly and precisely.

3. (10 pts) In class last Wednesday (2/27/13), we discussed six different ways to evaluate the strengths of a model.

   (a) (3 pts) List the names of **all six** of these different evaluation criteria.

   (b) (7 pts) Choose **ONE** of these evaluation criteria to describe more fully.

   - First, **give the definition** of this evaluation criterion.
   - Next, **give an example** of a model that **satisfies** this criterion.
   - And, **give an example** of a model that **does not satisfy** this criterion.

4. (10 pts) Suppose you have a dataset $\{x_i, y_i\}$ for $1 \leq i \leq n$, and a line of best fit $f(x) = mx+b$. Suppose in addition that **all the datapoints** lie on the line. Start with the definition of the R^2 coefficient and **prove** that $R^2 = 1$ for this dataset.

5. (5 pts) Determine the output of the following *Mathematica command*. Explain your reasoning.

```
Table[x^2,{x,-1,10,2}]
```

6. (10 pts) Write down *one or more lines* of *Mathematica* code that will fit a **polynomial of degree 3** to the data that is stored in the variable `dataset`.