Homework #1

For each problem below, construct an appropriate spreadsheet model that can be used to analyze the relevant decision for that problem. Your spreadsheet should follow the design principles covered in this course. Computing the correct numerical result will not receive full credit if your spreadsheet is not properly designed.

1. (50) Over-the-Rhine Bagels sells bagels and breakfast sandwiches from its trendy new store near Washington Park. OTRB sells its bagels for $4.50 each and its sandwiches for $7.00 each. Each bagel costs OTRB $1.00 and each sandwich costs $3.00. OTRB currently spends $500 per week on advertising, but it's not clear if this is the amount it should be spending for advertising. A market research firm has identified the relationship between OTRB's advertising spend and its sales of bagels and sandwiches. The research firm has determined the following formulas accurately predict the number of bagels and sandwiches OTRB sells each week as functions of its weekly Advertising spend:

$$\text{Bagels Sold} = 1000 \times (\text{Advertising})^{0.12},$$

$$\text{Sandwiches Sold} = 300 \times (\text{Advertising})^{0.20}.$$

   Use these formulas to construct a spreadsheet to compute OTRB's total weekly profit.

   RUBRIC: Spreadsheet Design (20 pts); Model Accuracy (30 pts)

2. (50) Carlito Fuente sells a custom Nicaraguan cigar, Bearcat Robusto, to UC fans during the football season. The demand for these cigars is uncertain, and Carlito does not know what the demand will be when he places the order with his Nicaraguan supplier in May. Carlito sells the cigars during the season for $80 per box, and any cigars left at the end of the season can be sold at a reduced price of $20 per box. Carlito pays the supplier $60 per box. Construct a spreadsheet to compute Carlito's profit assuming he orders 100 boxes, and he has demand for 90 boxes during the football season. Your spreadsheet should correctly compute Carlito's profit for ANY combination of order quantity and demand not just base case values provided here.

   RUBRIC: Spreadsheet Design (20 pts); Model Accuracy (30 pts)