Homework #1

1. Reef's Petroleum Company sells two grades of gasoline: Regular and Premium. RPC pays $2.00 for each gallon of Regular gasoline and $2.20 for each gallon of Premium gasoline that it sells. The owner's son, Luke Reef, has already analyzed the company's sales and price data. He discovered that the demand for each grade of gasoline is influenced by its own price as well as by the price of the other grade. Luke has estimated that the weekly demand for each grade of gasoline can be accurately estimated by the following formulas:

$$\text{Regular Demand} = 10{,}000 - 3{,}000 \times \text{RegularPrice} + 150 \times \text{PremiumPrice},$$

$$\text{Premium Demand} = 8{,}000 + 50 \times \text{RegularPrice} - 2{,}200 \times \text{PremiumPrice}.$$

   Construct a spreadsheet to compute RPC's total weekly profit. Use $2.50 and $2.70 as the base case selling prices for the Regular and Premium gasoline, respectively.

2. Lucy Lindner owns a small campus bookstore that also sells sportswear. In February, she must place an order with Nike for a new UC football shirt for the coming season. The long lead time is required for the contract manufacturers in Asia to order the necessary materials and to begin production in April. The shirts will be delivered to Lucy in early August just in time for the new season. Nike will charge Lucy $50 for each shirt she orders, and she will sell each shirt for $75 during the season. There will not be another opportunity for Lucy to order any more shirts if she runs out. At the end of the season Lucy will sell all the shirts that are left at a price of $15. Obviously, Lucy doesn't know exactly what the demand for these shirts will be, but during the past few years she has sold an average of 500 shirts each season that are similar to the new shirt. Use an order quantity of 600 and a demand of 525 for your base case values. Construct a spreadsheet model to analyze Lucy's decision.