**Homework #6**

**MSiA Program, Fall 2023**

**Optimization**

**Due: At the start of class on Mon 11/6/2023**

1. Mini Case Study: Simplified Revenue Management

Go to the spreadsheet: RM Exercise.xls

Assume you sell a product that customers value between $0 and $1,000 and is uniformly distributed. And assume that the selling season is approximated by 100 selling opportunities. That is, 100 customers will view your product and decide to buy it or not based on their willingness to pay.

To simulate the demand, the 100 selling opportunities are listed by the 100 entries in the Customer column. You can also see their willingness to pay. If you hit F9 to recalculate, the values will change. There is a column to determine whether they actually bought or not. At the top, you can enter the price you charge and see the revenue for your choice.

1. Go to the first tab. In this case, there is no correlation between how the customers arrive and their willingness to pay. If your goal is to maximize revenue, what price do you charge? You can only charge one price for the 100 customers. Why did you pick this price?
2. Go to the second tab. Now assume you have a capacity of only 15. What price do you charge to maximize your revenue? Why did you pick this price?
3. Go to the third tab. Now, the customers willing to pay less (between $0 and $500) arrive first. These customers are #1 to #50. The customers willing to pay more (between $500 and $1000) arrive next. Since you know this, you can charge two prices. What price to you charge for each segment? Why did you pick these prices? How did you do relative to your results on the first tab and why do you think this is so?
4. Go to the forth tab. Now you have the capacity constraint of 15. What price do you charge each segment? How did you do relative to the 2nd tab and why do you think this is so?
5. In part (d), how would your answer change if the capacity was 40, not 15?
6. Do problem #2 from the back of the PDF, “Introduction to the Theory and Practice of Revenue Management”
7. Do problem #4 from the back of the PDF, “Introduction to the Theory and Practice of Revenue Management”