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Section C

Retail Simulation Report

Question 1:

For our retail markdown price strategy, our team came up with a relatively simple approach. We decided that the best approach would be to examine the sales amount of each day and adjust our prices accordingly. Our strategy was based on the original amount of sales on the first day. We then determined that if the number of sales fell below 65% of the original value two days in a row, we would discount the price by 20%. After the price drop, we set a new target value of 65% of the sales at the new discounted price. If sales fell below the new value, then we discounted the item at 40% and sold the leftover inventory at the salvage price of $25.

Question 2:

After reviewing the historical sales, we determined that none of the models we learned in class would be appropriate for this exercise. Since we are not trying to forecast/restock demand or cut down on queue times, the Newsvendor, GGN, and revenue sharing models would not be useful. We also concluded that the number of sales at one specific price was too random and could not be forecasted effectively. We did notice, however, that there was a large spike in demand after each price drop. The larger the price markdown, the higher demand spiked. If we only discounted 10%, then the demand rose only slightly and the profits were much closer to the unmarked price. At a 40% discount, the number of sales increased rapidly, but the marginal revenue of each item was only 20% higher than the salvage price. Our group decided that the best approach would be to strike balance and discount an item 20% to $48 per unit. This would insure a large increase in the number of sales while not sacrificing too much revenue on a per sale basis.

As for the timing of the price drop, we decided that we should focus of the number of sales per day. In order to maximize revenue, we concluded that it would be best to sell items at the highest possible price as long as the sales remained in a reasonable range. After careful evaluation of the data, we decided that a reasonable allowable variance for the number of sales would be 35% (about 1/3). Selling 1/3 of the units at the unmarked price would be the equivalent of selling the original amount of units at a discounted price between 20%-40%. If sales fell below 65% of the original amount, then it would be more profitable to increase sales by discounting the price 20%. However, since the data has a very unpredictably high variance, we decided that we should wait until the data fell below that range two times in a row before we mark down the price 20%.

Question 3:

Unfortunately, we experienced some software problems for the very first run on the first seed. Instead we will commentate the second run. On day one, the number of sales was 64. So we calculated our target value at 64(.65)= 42. If the number of sales fell below 42 two times in a row, then we would discount the price by 20%. Day two prices fell to 18 sales, so if sales fell below 42 one more time then we would have to discount the price. However, on day three the sales rose again to 59. We experienced another alert on day four, but the sales rose again through day 6. The sales fell below the threshold only two more times at days seven and ten. But since we never experienced two consecutive decreased sales days, we keep the price at 60 per unit throughout the entire run.

Question 4:

Printouts Provided. Our total revenue was 456279+432281= 881645. It was only 5.42% off of the perfectly forecasted revenue.