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**BUS 443 Business Analytics**

**Final Team Project – Part 3: New Optimization and Simulation Cases**

**Part 3a: Integer Optimization Case for Applecore:**

Complete the Chapter 9 Case. Add this to your website, and I will grade it from there.

**Part 3b: Monte Carlo Risk Simulation for Applecore:**

Applecore (introduced in the Chapter 9 Case cited above) self-insures its employee health insurance claims. That is, it collects a fixed amount each month from every employee for health care costs, and then it pays the entire claim amount using its own funds to make up the difference. The management of Applecore would like to estimate its total healthcare payments (risk) for the coming year.

The total number of employees at the start of the year is 10,125. The firm expects the number of employees to change each month over the coming year by a percentage that is uniformly distributed between -2% and 5%. Employees contribute $150 each month toward their healthcare costs, while the average claim is $275 per month. The average claim itself is expected to grow by an amount given by a normal distribution with a mean of 1% and a standard deviation of 2%.

**Instructions:**

1. Create a simulation model to estimate the total health care payments for the upcoming year.
2. What is the approximate *expected* cost (mean) to the company of covering employee health care costs in the coming year? (Be sure to input all of the given parameters in cells and refer to the appropriate cell locations instead of hard-coding the values in your simulation model.)
3. What is the estimate of the *maximum* cost to the company of covering employee health care costs in the coming year?
4. Comment on any additional insights you derive from your analysis and insert the comments into your worksheet.
5. Add the Excel simulation workbook to your website. I will grade it from there.