Assignment 8 (MBA 693)

Problem 1: Production Operations Application

Gatson manufacturing company produces two types of tires: Economy tires and Premium tires. The manufacturing time and the profit contribution per tire are given in the following table.

Operation	Manufacturing Time (Hours)		Time Available
	Economy tires	Premium tires	Hours
Material Preparation	4/3	1/2	600
Tire Building	4/5	1	650
Curing	1/2	2/4	580
Final Inspection	1/5	1/3	120
Profit/Tire	$12	$10	

Answer the following assuming that the company is interested in maximizing the total profit contribution.

   a. What is the linear programming model for this problem?
   b. Develop a spreadsheet model and find the optimal solution using Excel Solver. How many tires of each model should Gatson manufacture?
   c. What is the total profit contribution Gatson can earn with the optimal production quantities?

Problem 2: Investment Strategy

J. D. Williams, Inc. is an investment advisory firm that manages more than $120 million in funds for its numerous clients. The company uses an asset allocation model that recommends the portion of each client's portfolio to be invested in a growth stock fund, an income fund, and a money market fund. To maintain diversity in each client's portfolio, the firm places limits on the percentage of each portfolio that may be invested in each of the three funds. General guidelines indicate that the amount invested in the growth fund must be between 20% and 40% of the total portfolio value. Similar percentages for the other two funds stipulate that between 20% and 50% of the total portfolio value must be in the income fund and that at least 30% of the total portfolio value must be in the money market fund.

In addition, the company attempts to assess the risk tolerance of each client and adjust the portfolio to meet the needs of the individual investor. For example, Williams just contracted with a new client who has $800,000 to invest. Based on an evaluation of the client's risk tolerance, Williams assigned a maximum risk index of 0.05 for the client. The firm's risk indicators show the risk of the growth fund at 0.10, the income fund at 0.07, and the money market fund at 0.01. An overall portfolio risk index is computed as a weighted average of the risk rating for the three funds, where the weights are the fraction of the client's portfolio invested in each of the funds.

Additionally, Williams is currently forecasting annual yields of 18% for the growth fund, 12.5% for the income fund, and 7.5% for the money market fund. Based on the information provided, how should the

new client be advised to allocate the $800,000 among the growth, income, and money market funds? Develop a linear programming model that will provide the maximum yield for the portfolio. Use your model to develop a managerial report.

a) Recommend how much of the $800,000 should be invested in each of the three funds. What is the annual yield you anticipate for the investment recommendation?

b) Assume that the client's risk index could be increased to 0.055. How much would the yield increase, and how would the investment recommendation change?

c) Refer again to the original situation, in which the client's risk index was assessed to be 0.05. How would your investment recommendation change if the annual yield for the growth fund were revised downward to 16% or even to 14%?

d) Assume that the client expressed some concern about having too much money in the growth fund. How would the original recommendation change if the amount invested in the growth fund is not allowed to exceed the amount invested in the income fund?

e) The asset allocation model you developed may be useful in modifying the portfolios for all of the firm's clients whenever the anticipated yields for the three funds are periodically revised. What is your recommendation as to whether use of this model is possible?