**Diagram

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**Data Analytics - BAN-357-BOS1**

**Assignment 2: Case Problem-“Four Corners”**

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Dear Four Corners’ employees,

Tom Gifford, Human Resource Department Representative at Four Corners, developed a financial plan that would help employees to receive answers to these questions:

* What will your investment portfolio be worth in 10 years or 20 years?
* When do you need to stop working?

Firstly, Tom experimented with a developed financial plan for himself and built an Excel worksheet for 5 years following his assumptions such as:

* he has accumulated a portfolio valued at $50,000
* he plans to work 20 more years
* he expects to accumulate a portfolio of $1,000,000
* he assumed a 5% annual growth rate
* he plans to do a 6% investment contribution of his.

Kate Krystkowiak, Tom’s supervisor, provided several contra arguments to developed financial. She claimed that year to year most employees experience different annual salary growth rates and different actual growth rates. She also stated that the constant annual portfolio growth rate was unrealistic. According, Tom and Kate decided to use random variability in the salary growth rate and the portfolio growth rate and update old assumptions such as:

* Assuming the annual growth rate varies from 0% to 5 %
* Assuming that the annual portfolio growth rate could be rounded by a normal probability distribution with a mean of 10% and a standard deviation of 5%.

Overall, my managerial report talks about Tom’s steps for developing a financial plan model then Tom’s and Kate’s steps along with my recommendations to them.

1. Without considering the random variability and extending Tom’s excel worksheet for 20 years Tom can expect to have a 20 year-portfolio of $772,722. However, if Tom aims to have a 20 year-portfolio of $1,000,000, Tom needs to increase his annual investment growth by 9.13%.
2. Redesigning the spreadsheet model to incorporate the random variability of the annual growth rate and the annual portfolio growth rate into the simulation model to illustrate the attainability of a 20-year portfolio of $1,000,000. I converted Tom’s financial plan into a simulation model by using the 1,000 trails. There is a 4.6% probability of having $1,000,000 or more by year 20. The 20-year portfolio varied across a range between $600,000 and $800,000. The 95% confidence interval on the mean portfolio shows that a 20-year portfolio will be worth a minimum of $702,892 and a maximum of $703,479. The Frequency of Ending Portfolio graph for 20 years supports my findings.
3. I would recommend to the employees whose current portfolios are like Tom’s to begin early with the investment program. An early start gives more years to accomplish a high-valued ending portfolio. I would also recommend increasing the investment rate to have a significant impact on the long-term portfolio. Lastly, employees should choose a long-term portfolio even though they cannot get a significant change in their portfolio. According, they should patiently wait for the end of the portfolio to see its significant change and should not do early withdrawal for their short-term expenses.
4. If Tom plans to have a 25-year portfolio of $1,000,000 instead of 20 years, he could use the same method he did for 20 years. In other words, extending the spreadsheet model to incorporate the random variability of the annual growth rate and the annual portfolio growth rate into the simulation model. There is a 17.5% probability of having $1,000,000 or more by year 25. The 25-year portfolio varied across a range between $900,000 and $1,100,000. The 95% confidence interval on the mean portfolio shows that a 25-year portfolio will be worth a minimum of $1,064,843 and a maximum of $1,065,685. The Frequency of Ending Portfolio graph for 20 years supports my findings.
5. The financial planning model, which is a simulation worksheet, developed for Tom Gifford can be used as a template to develop a financial plan for any other f company’s employees by entering age, current salary, and anticipated salary growth rate, anticipated investment rate, and anticipated portfolio growth rate.