QMETH 500 Wi 21: Statistical Data Analysis for Management

Course Summary

The main objective of this course is to help you develop the skills necessary to use statistical tools in the empirical evaluation of business decisions, and to help you become an informed consumer of information.

Topics:

1st Half (1/4 – 2/5): We first discuss basic concepts of ***descriptive statistics***, then examine the definitions and rules of ***probability*** and how they apply to business problems. Applications of probability theory (e.g., Bayes' Theorem) is further explored in the 2nd week of the course through the ***decision analysis*** framework which is a subject you will continue to learn/use in different courses later the program. In the 3rd and 4th weeks, we deepen our understanding of variables and probability by studying basic properties of ***random variables*** and explore major ***probability distributions*** that are frequently applicable in business analysis. These distributions include ***Poisson and Binomial (discrete)*** and ***Uniform, Normal, and Exponential (continuous)***. In the fifth week we explore the ***Central Limit Theorem and Sampling Distribution*** which are fundamental to concepts in inferential statistics. These concepts are built on your understanding of a normal distribution introduced in the previous learning module, and a brief discussion on applications in the field of quality control is supplemented as an asynchronous video.

2nd Half (2/8 – 3/14): In week 6, our focus shifts completely to inferential statistics (using sample data to make inferences about the characteristics of a population). Building on concepts in the previous module, we learn how to estimate the unknown population parameters by constructing a ***Confidence Interval*** for a mean and proportion. In week 7, we investigate the logic and process of ***Hypothesis Tests*** which highlight the power of inferential statistics in testing assumptions and theories that help guide business decisions. Based on your fundamental understanding of hypothesis tests, we discuss the ***Analysis of Variance (ANOVA)*** in week 8. This knowledge allows us to compare more than two means simultaneously, further expanding your capability to analyze complex business problems. In week 9 we study the ***Regression Analysis*** framework, which is a statistical procedure used to examine how variables are related. Our discussion begins with a ***Simple Regression*** (one independent variable and one dependent variable) which underscores the interconnection among different topics we have learned. Then we extend the model to two or more independent variables or ***Multiple Regression***. In the closing week, we discuss the general idea behind ***Logistic Regression*** where the dependent variable is categorical and review key learning points of the course.

Achieving the Learning Objectives:

With the course being delivered online, multiple types of assignments (asynchronous & synchronous, individual & team) are designed to reinforce your understanding of the subject matter, enrich the team learning experience, and keep you motivated/engaged. These include live class challenges, Test Your Knowledge quizzes, short case analyses, case study, discussion boards, quizzes, and exams.

Issariya Sirichakwal