STA 3180 Statistical Modelling: Structural Equation Modeling

I. Introduction to Structural Equation Modeling

A. Definition of Structural Equation Modeling

B. Overview of the Modeling Process

II. Estimation of Structural Equation Models

A. Maximum Likelihood Estimation

1. Definition of Maximum Likelihood Estimation

2. Steps in the Estimation Process

3. Good Problem Solving Strategies:

a. Understand the assumptions of the model

b. Identify the parameters to be estimated

c. Use numerical optimization techniques to find the maximum likelihood estimates

B. Bayesian Estimation

1. Definition of Bayesian Estimation

2. Steps in the Estimation Process

3. Good Problem Solving Strategies:

a. Understand the assumptions of the model

b. Identify the parameters to be estimated

c. Use Markov Chain Monte Carlo (MCMC) techniques to find the posterior distribution of the parameters

III. Evaluation of Structural Equation Models

A. Goodness-of-Fit Tests

1. Definition of Goodness-of-Fit Tests

2. Types of Goodness-of-Fit Tests

3. Good Problem Solving Strategies:

a. Understand the assumptions of the model

b. Identify the appropriate goodness-of-fit test for the model

c. Use the test statistic to evaluate the model

B. Model Selection Criteria

1. Definition of Model Selection Criteria

2. Types of Model Selection Criteria

3. Good Problem Solving Strategies:

a. Understand the assumptions of the model

b. Identify the appropriate model selection criteria for the model

c. Use the criteria to compare different models and select the best one