STA 3180 Statistical Modelling: Regression

Topic: Regression

I. Introduction to Regression

A. Definition of Regression

B. Types of Regression

1. Simple Linear Regression

2. Multiple Linear Regression

3. Logistic Regression

4. Polynomial Regression

C. Assumptions of Regression

II. Estimation and Inference

A. Estimation of Regression Parameters

1. Least Squares Estimation

2. Maximum Likelihood Estimation

B. Hypothesis Testing

1. t-tests

2. F-tests

III. Model Building

A. Variable Selection

1. Stepwise Selection

2. Best Subset Selection

B. Model Diagnostics

1. Residual Analysis

2. Multicollinearity

Problem Solving Strategies:

1. Understand the assumptions of the model and how they affect the results.

2. Use the correct estimation and inference techniques for the type of regression being used.

3. Utilize variable selection methods to determine the best model.

4. Analyze the residuals to ensure the model is valid.
5. Check for multicollinearity to ensure the model is not overfitted.