STA 3180 Statistical Modelling: Bootstrapping

Topic: Bootstrapping

I. Introduction to Bootstrapping

A. Definition of Bootstrapping

B. Benefits of Bootstrapping

II. Bootstrapping Techniques

A. Sampling with Replacement

1. Understanding the concept of sampling with replacement

2. Identifying when to use sampling with replacement

3. Problem solving strategies:

    a. Visualize the data and identify patterns

    b. Utilize the bootstrap method to estimate the population parameters

B. Permutation Tests

1. Understanding the concept of permutation tests

2. Identifying when to use permutation tests

3. Problem solving strategies:

    a. Understand the assumptions of the test

    b. Utilize the permutation test to compare two or more groups

III. Bootstrapping Applications

A. Regression Analysis

1. Understanding the concept of regression analysis

2. Identifying when to use regression analysis

3. Problem solving strategies:

    a. Understand the assumptions of the model

    b. Utilize the bootstrap method to estimate the regression coefficients

B. Hypothesis Testing

1. Understanding the concept of hypothesis testing

2. Identifying when to use hypothesis testing

3. Problem solving strategies:

    a. Understand the assumptions of the test

    b. Utilize the bootstrap method to estimate the p-value