STA 3180 Statistical Modelling: Statistical Computing

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Introduction

Statistical computing is an important part of statistical modelling. It involves the use of computers to perform statistical analysis and calculations. This includes the use of software packages such as R, SAS, SPSS, and Stata. In this lecture, we will discuss the basics of statistical computing and how it can be used in statistical modelling.

Key Concepts

• Data Management: Data management is the process of organizing and storing data in a way that makes it easier to access and analyze. This includes creating databases, setting up data structures, and formatting data.

• Data Analysis: Data analysis is the process of analyzing data to draw conclusions and make decisions. This includes descriptive statistics, inferential statistics, and predictive analytics.

• Statistical Programming: Statistical programming is the process of writing code to perform statistical analysis. This includes writing code to generate descriptive statistics, run regression models, and create visualizations.

• Software Packages: Software packages are programs that can be used to perform statistical analysis. Examples include R, SAS, SPSS, and Stata.

Definitions

• Database: A database is a collection of data organized in a structured way.

• Data Structure: A data structure is a way of organizing data in a database.

• Descriptive Statistics: Descriptive statistics are used to summarize and describe data. Examples include measures of central tendency (mean, median, mode) and measures of dispersion (standard deviation, range).

• Inferential Statistics: Inferential statistics are used to make inferences about a population based on a sample. Examples include hypothesis testing and confidence intervals.

• Predictive Analytics: Predictive analytics are used to make predictions about future events. Examples include regression models and machine learning algorithms.

• Code: Code is a set of instructions written in a programming language that tells a computer what to do.

Practice Multiple Choice Questions

1. Which of the following is NOT a type of statistical analysis?

A. Descriptive Statistics

B. Predictive Analytics

C. Database Management

D. Inferential Statistics

Answer: C. Database Management

Explanation: Database management is a type of data management, not a type of statistical analysis. Descriptive statistics, predictive analytics, and inferential statistics are all types of statistical analysis.