Statistical Modeling for Biomedical Researchers: An Essential Guide

Statistical modeling is a powerful tool that can be used to solve a wide range of problems in biomedical research. By using statistical models, researchers can gain insights into the data they collect, make predictions, and test hypotheses. This book provides a comprehensive to statistical modeling for biomedical researchers, covering the basics of statistical inference, regression analysis, survival analysis, and clinical trials.

Statistical Modeling for Biomedical Researchers: A Simple Introduction to the Analysis of Complex Data

by William D. Dupont

★★★★☆ 4.2 out of 5

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Statistical modeling is a branch of statistics that involves the use of mathematical models to represent real-world phenomena. Statistical models can be used to describe data, make predictions, and test hypotheses. In biomedical research, statistical modeling is used to analyze a wide range of data, including clinical trial data, observational data, and genetic data. Statistical modeling can help researchers to identify risk factors for disease, develop new treatments, and improve patient outcomes.

Statistical Inference

Statistical inference is the process of making an estimate or prediction about a population based on a sample. Statistical inference is based on the assumption that the sample is representative of the population. The most common types of statistical inference are estimation and hypothesis testing. Estimation is the process of estimating the value of a population parameter, such as the mean or variance. Hypothesis testing is the process of testing a hypothesis about a population parameter, such as whether the mean of a population is equal to a certain value.

Regression Analysis

Regression analysis is a statistical technique that is used to model the relationship between a dependent variable and one or more independent variables. The dependent variable is the variable that is being predicted, and the independent variables are the variables that are used to make the prediction. Regression analysis can be used to identify the factors that are associated with a particular outcome, and to make predictions about the outcome based on the values of the independent variables.

Survival Analysis

Survival analysis is a statistical technique that is used to analyze the time until an event occurs. Survival analysis is often used to study the time until death, but it can also be used to study other events, such as the time until a patient is cured of a disease or the time until a patient experiences a relapse. Survival analysis can help researchers to identify the factors that are associated with a shorter or longer survival time, and to make predictions about the survival time of a patient based on their individual characteristics.

Clinical Trials

Clinical trials are research studies that are conducted to evaluate the safety and effectiveness of new treatments. Clinical trials are typically conducted in a controlled setting, with participants being randomly assigned to receive the new treatment or a control treatment. Statistical modeling is used to analyze the data from clinical trials to determine whether the new treatment is effective and whether it is safe. Statistical modeling can also be used to design clinical trials, to determine the sample size and the length of the study.

Statistical Modeling for Biomedical Researchers is an essential guide for students and researchers in the biomedical and health sciences. This book provides a comprehensive to statistical modeling, covering the basics of statistical inference, regression analysis, survival analysis, and clinical trials. With its clear explanations and numerous examples, this book is an ideal resource for anyone who wants to learn more about statistical modeling.

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