Focusing on the roles of different segments of DNA, **Statistics in Human Genetics and Molecular Biology** provides a basic understanding of problems arising in the analysis of genetics and genomics. It presents statistical applications in genetic mapping, DNA/protein sequence alignment, and analyses of gene expression data from microarray experiments.

The text introduces a diverse set of problems and a number of approaches that have been used to address these problems. It discusses basic molecular biology and likelihood-based statistics, along with physical mapping, markers, linkage analysis, parametric and nonparametric linkage, sequence alignment, and feature recognition. The text illustrates the use of methods that are widespread among researchers who analyze genomic data, such as hidden Markov models and the extreme value distribution. It also covers differential gene expression detection as well as classification and cluster analysis using gene expression data sets.

Exploring the core topics of genetics and genomics, this book presents various approaches to help solve problems at the interface of statistics, biostatistics, computer science, and related fields in applied mathematics.

Features

- Describes a variety of statistical methods used to solve problems in genetics and genomics
- Focuses on genetic mapping, DNA/protein sequence alignment, and analyses of gene expression data from microarray experiments
- Presents popular methods, such as hidden Markov models, for analyzing genomic data
- Contains a substantial breadth of material on microarrays
- Provides some Bayesian approaches for solving problems
- Includes many worked examples and end-of-chapter exercises

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