Statistical Methods in Bioinformatics (Statistics for Biology and Health)

W. J. Ewens, Warren Ewens, Gregory Grant
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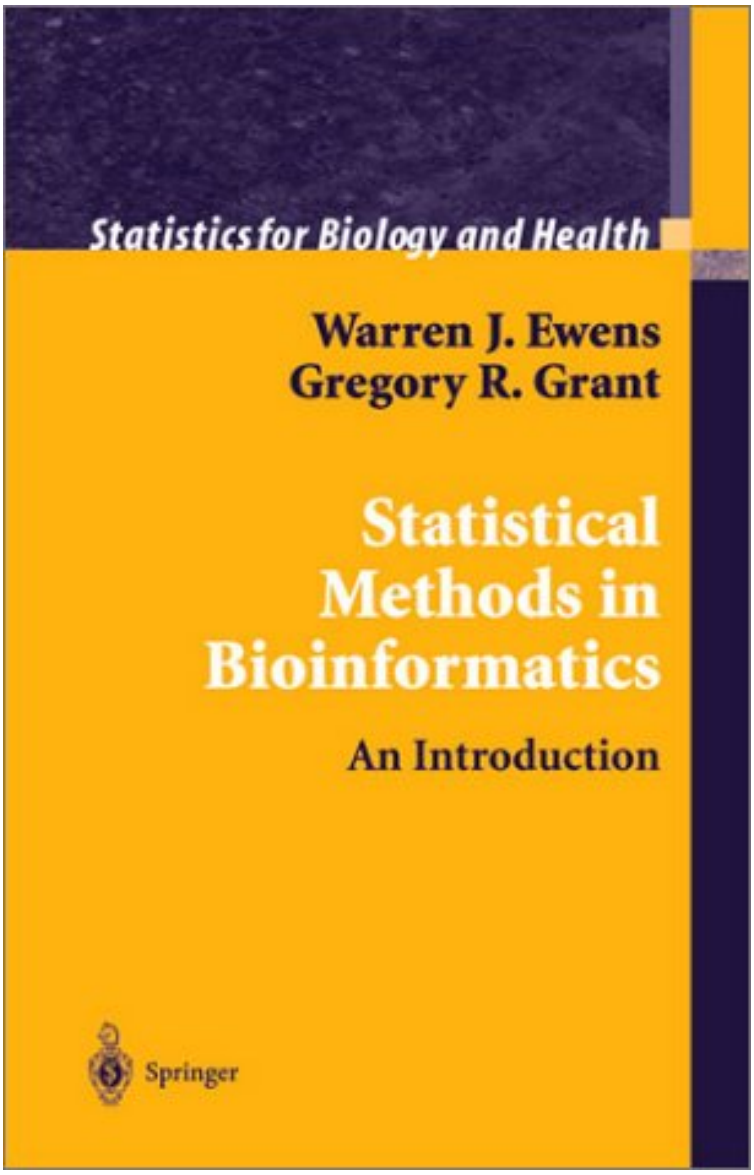

#1714321 in Books 2001-04-01Original language:EnglishPDF # 1 1.07 x 6.40 x 9.55l, 1.78 #File Name: 0387952292476 pages | File size: 37.Mb

W. J. Ewens, Warren Ewens, Gregory Grant : Statistical Methods in Bioinformatics (Statistics for Biology and Health) before purchasing it in order to gage whether or not it would be worth my time, and all praised Statistical Methods in Bioinformatics (Statistics for Biology and Health):

0 of 0 people found the following review helpful. Hot messBy SharSharThis book is disorganized. Like another

review noted, the textbook presents "heuristic methods in a cookbook fashion, with little reference to what is going on biologically as well as mathematically." Additionally it skips steps during explanation on certain algorithms. The writing is wordy and unclear at times. This was a required textbook for my class, and it's not very helpful.28 of 29 people found the following review helpful. Great all-around review of probabilityBy wiredweirdThe book's title says 'Statistical Methods', but all of statistics is derived from probability theory. That's really where Ewens and Grant start, with the best high-density review of probability I know.The first two chapters cover probabilities of one and many variables, respectively. This includes several topics that other authors equently skip, including conditional and marginal probabilities, probability- and moment-generating functions, a little about entropy, distributions of sums, and extreme value statistics. All that takes about 100 pages. Two later chapters cover statistical inference (parameter estimation, hypothesis testing, and Bayesian techniques), two more cover stochastic processes including Markov models, a short chapter includes hidden Markov models and their training, and another chapter covers sampling techniques: bootstraps, permutation tests and such.If the book contained only that material, it would still be a valuable review and summary of basic probability. It's way too dense to be a beginner's text. That's OK, those chapters were really intended as a review and as a statement of the terms and notation used in the book's real objectives: models of biological systems.The chapters on biological applications are interspersed with chapters on basics, so that each application is presented as soon as its elements are covered. Those chapters describe statistical properties of a single DNA or protein string, relationships between two strings, BLAST and its scoring models, mutation modeling, and construction of phylogenetic trees. Coverage of each topic is brief but very dense. A surprising amount of information is packed into each brief chapter, and it's surprisingly readable. Still, these are big topics. Ewens and Grant don't and don't try to present any topic to its full depth. Instead, they give enough discussion that a determined reader can learn the basics, and can understand more advanced discussions of specific topics.The book does require a determined reader with some background in probability - this shouldn't be anyone's first book, unless you have a very skilled teacher. The prepared and careful reader will be very well rewarded, however. Despite the book's title about statistics and bioinformatics, this is a reference you may use for probability models in any field. It's certainly one that I keep coming back to.//wiredweird17 of 19 people found the following review helpful. Disappointing overviewBy DoctorAndyThis book is a tremendous disappointment, given other reviews and the impressive Table of Contents. I picked several topics about which I know something: Likelihoods, P-values, bootstraps. I would have had NO idea about either of these subjects based on the poor delivery in this book. Topics are not well introduced, there are virtually no examples, and the introduction/discussion of most topics is wordy and not informative.A topic such as the two-sample t-statistic is scattered throughout the book, with the main part not even cited in the index!Unfortunately there are not a lot of books in the field of Statistics in Bioinformatics. However, I would recommend "The Elements of Statistical Learning" (Hastie et al.) for classifiers etc (Duda and Hart's classic is also good). I would recommend "Biostatistical Analysis" by Zar for a general coverage, and Terry Speed's "stat Labs: Mathematical Statistics ..." which is not comprehensive but has good lab examples with associated statistical analysis.

Bioinformatics concerns the application of information technology to the study and analysis of biological and in particular genetic, data. The field has been further developed by the increase in DNA data generation. This has led to the generation of massive data sets. However, students of bioinformatics should not simply restrict their interests to computer science theory. Substantial training in various areas of biology, such as molecular genetics, is essential for a deeper understanding of the subject. This book provides an introductory account of probability theory, statistics and stochastic process theory.