<<用S-Plus做金融数据统计分析>>

图书基本信息

书名：<<用S-Plus做金融数据统计分析>>

13位ISBN编号：9787510027451

10位ISBN编号：7510027454

出版时间：2010-9

出版时间：世界图书出版公司

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页数：451

前言

This book grew out of lectures notes written for a one-semester junior statisticscourse offered to the undergraduate students majoring in the Department of Oper-ations Research and Financial Engineering at Princeton University. Tidbits of thehistory of this course will shed light on the nature and spirit of the book.The purpose of the course is to introduce the students to modem data analysiswith an emphasis on a domain of application that is of interest to most of them:financial engineering. The prerequisites for this course are minimal, however it isfair to say that all of the students have already taken a basic introductory statisticscourse. Thus the elementary notions of random variables, expectation and correlationare taken for granted, and earlier exposure to statistical inference （estimation, testsand confidence intervals） is assumed. It is also expected that the students are familiarwith a minimum of linear algebra as well as vector and matrix calculus.Because of my background, the course is both computational and mathematicalin nature. Most problems considered are formulated in a rigorous manner. Mathe-matical facts are motivated by applications, stated precisely, justified at an intuitivelevel, but essentially never proven rigorously. The emphasis is more on the relevanceof concepts and on the practical use of tools, rather than on their theoretical under-pinnings.

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内容概要

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章节摘录

插图：The look of a histogram can change significantly when the number of bins andthe origin of the bins are changed. The reader is encouraged to produce differenthistograms for the same data sample by setting the value of the parameter nclassto different integers.Remark. The commands given above （as well as most of the commands in thisbook） can be used both on a Unix/Linux platform and under Windows. There aremany other ways to produce plots, especially under Windows. For example, one canselect the columns of the variables to be plotted, and then click on the appropriatebutton of the 2-D plot palette. In fact, some of these alternative methods give plotsof better quality. Nevertheless, our approach will remain to provide S-plus com-mands and function codes which can be used on any platform supported by S- Plus,and essentially with any version of the program.A good part of classical parametric estimation theory can be recast in the frameworkof density estimation: indeed, estimating the mean and the variance of a normalpopulation is just estimating the density of a normal population. Indeed, a Gaussiandistribution is entirely determined by its first two moments, and knowing its meanand variance is enough to determine the entire distribution. Similarly, estimatingthe mean of an exponential population is the same as estimating the density of thepopulation since the exponential distribution is completely determined by its rateparameter, which in turn is determined by the mean of the distribution. We are notinterested in these forms of parametric density estimation in this section. Instead, weconcentrate on nonparametric procedures.Like most nonparametric function estimation procedures, the histogram relieson the choice of some parameters, two to be precise. Indeed, in order to produce ahistogram, one has to choose the width of the bins, and the origin from which thebins are defined. The dependence of the histogram upon the choice of the origin isan undesirable artifact of the method. In order to circumvent this shortcoming, thenotion of averaged histogram was introduced: one histogram is computed for eachof a certain number of choices of the origin, and all these histograms are averagedout to produce a smoother curve expected to be robust to shifts in the origin. Thisestimate is called the ASH estimate of the density of the population, the three initialsA,S and H standing for "average shifted histogram". See the Notes & Complementsat the end of this chapter for references.Even though ASH estimates are free of the artificial dependence on the choice ofthe origin, they are still dependent on the particular choice of the bin width, the latterbeing responsible for the look of the final product: ragged curves from a choice ofsmall bin widths, and smoother looking blocks from a choice of larger bin widths.The decisive influence of this parameter should be kept in mind as we inch our waytoward the introduction of our favorite density estimation procedure.

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