Student Solutions Manual to Accompany

FUNDAMENTALS of QUEUEING THEORY

Fourth Edition

DONALD GROSS
JOHN F. SHORTLE
JAMES M. THOMPSON
CARL M. HARRIS



Fundamentals Of Queueing Theory Solutions Manual 4th Edition

Julia Schneider

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Fundamentals of Queueing Theory, Solutions Manual Donald Gross, John F. Shortle, James M. Thompson, Carl M. Harris, 2008-07-28 Presents the basic statistical principles that are necessary to analyze the probabilistic nature of queues Thoroughly revised and expanded to reflect the latest developments in the field the fourth edition of emFundamentals of Queueing Theory illustrates the wide reaching fundamental concepts in queueing theory and its applications to diverse areas such as computer science engineering business and operations research It takes a numerical approach to understanding and making probable estimations relating to queues with a comprehensive outline of simple and more advanced queueing models Newly featured topics include retrial queues approximations for queueing networks numerical inversion of transforms and determining the appropriate number of servers to balance quality and cost of service **Solutions Manual to Accompany** Fundamentals of Queueing Theory, Fifth Edition Donald Gross, John F. Shortle, James M. Thompson, Carl M. Harris, 2016-11-07 Fundamentals of Queueing Theory Donald Gross, John F. Shortle, James M. Thompson, Carl M. Harris, 2011-09-23 Praise for the Third Edition This is one of the best books available Its excellent organizational structure allows quick reference to specific models and its clear presentation solidifies the understanding of the concepts being presented IIE Transactions on Operations Engineering Thoroughly revised and expanded to reflect the latest developments in the field Fundamentals of Queueing Theory Fourth Edition continues to present the basic statistical principles that are necessary to analyze the probabilistic nature of gueues Rather than presenting a narrow focus on the subject this update illustrates the wide reaching fundamental concepts in queueing theory and its applications to diverse areas such as computer science engineering business and operations research This update takes a numerical approach to understanding and making probable estimations relating to queues with a comprehensive outline of simple and more advanced queueing models Newly featured topics of the Fourth Edition include Retrial queues Approximations for queueing networks Numerical inversion of transforms Determining the appropriate number of servers to balance quality and cost of service Each chapter provides a self contained presentation of key concepts and formulae allowing readers to work with each section independently while a summary table at the end of the book outlines the types of queues that have been discussed and their results In addition two new appendices have been added discussing transforms and generating functions as well as the fundamentals of differential and difference equations New examples are now included along with problems that incorporate QtsPlus software which is freely available via the book s related Web site With its accessible style and wealth of real world examples Fundamentals of Queueing Theory Fourth Edition is an ideal book for courses on queueing theory at the upper undergraduate and graduate levels It is also a valuable resource for researchers and practitioners who analyze congestion in the fields of telecommunications transportation aviation and management science Loss Models: From Data to Decisions, 4e Student Solutions Manual Stuart A. Klugman, Harry H. Panjer, Gordon E. Willmot, 2014-08-21 Student Solutions Manual to Accompany

Loss Models From Data to Decisions Fourth Edition This volume is organised around the principle that much of actuarial science consists of the construction and analysis of mathematical models which describe the process by which funds flow into Foundations of Linear and Generalized Linear Models Alan Agresti, 2015-01-15 A and out of an insurance system valuable overview of the most important ideas and results in statistical modeling Written by a highly experienced author Foundations of Linear and Generalized Linear Models is a clear and comprehensive guide to the key concepts and results of linearstatistical models The book presents a broad in depth overview of the most commonly used statistical models by discussing the theory underlying the models R software applications and examples with crafted models to elucidate key ideas and promote practical modelbuilding The book begins by illustrating the fundamentals of linear models such as how the model fitting projects the data onto a model vector subspace and how orthogonal decompositions of the data yield information about the effects of explanatory variables Subsequently the book covers the most popular generalized linear models which include binomial and multinomial logistic regression for categorical data and Poisson and negative binomial loglinear models for count data Focusing on the theoretical underpinnings of these models Foundations of Linear and Generalized Linear Models also features An introduction to quasi likelihood methods that require weaker distributional assumptions such as generalized estimating equation methods An overview of linear mixed models and generalized linear mixed models with random effects for clustered correlated data Bayesian modeling and extensions to handle problematic cases such as high dimensional problems Numerous examples that use R software for all text data analyses More than 400 exercises for readers to practice and extend the theory methods and data analysis A supplementary website with datasets for the examples and exercises An invaluable textbook for upper undergraduate and graduate level students in statistics and biostatistics courses Foundations of Linear and Generalized Linear Models is also an excellent reference for practicing statisticians and biostatisticians as well as anyone who is interested in learning about the most important statistical models for analyzing data An Introduction to Probability and Statistics Vijay K. Rohatqi, A. K. Md. Ehsanes Saleh, 2015-09-01 A well balanced introduction to probability theory and mathematical statistics Featuring updated material An Introduction to Probability and Statistics Third Edition remains a solid overview to probability theory and mathematical statistics Divided into three parts the Third Edition begins by presenting the fundamentals and foundations of probability The second part addresses statistical inference and the remaining chapters focus on special topics An Introduction to Probability and Statistics Third Edition includes A new section on regression analysis to include multiple regression logistic regression and Poisson regression A reorganized chapter on large sample theory to emphasize the growing role of asymptotic statistics Additional topical coverage on bootstrapping estimation procedures and resampling Discussions on invariance ancillary statistics conjugate prior distributions and invariant confidence intervals Over 550 problems and answers to most problems as well as 350 worked out examples and 200 remarks Numerous figures to further illustrate examples and proofs throughout An

Introduction to Probability and Statistics Third Edition is an ideal reference and resource for scientists and engineers in the fields of statistics mathematics physics industrial management and engineering The book is also an excellent text for upper undergraduate and graduate level students majoring in probability and statistics **Applied Longitudinal Analysis** Garrett M. Fitzmaurice, Nan M. Laird, James H. Ware, 2012-10-23 Praise for the First Edition this book should be on the shelf of everyone interested in longitudinal data analysis Journal of the American Statistical Association Features newly developed topics and applications of the analysis of longitudinal data Applied Longitudinal Analysis Second Edition presents modern methods for analyzing data from longitudinal studies and now features the latest state of the art techniques The book emphasizes practical rather than theoretical aspects of methods for the analysis of diverse types of longitudinal data that can be applied across various fields of study from the health and medical sciences to the social and behavioral sciences. The authors incorporate their extensive academic and research experience along with various updates that have been made in response to reader feedback The Second Edition features six newly added chapters that explore topics currently evolving in the field including Fixed effects and mixed effects models Marginal models and generalized estimating equations Approximate methods for generalized linear mixed effects models Multiple imputation and inverse probability weighted methods Smoothing methods for longitudinal data Sample size and power Each chapter presents methods in the setting of applications to data sets drawn from the health sciences New problem sets have been added to many chapters and a related website features sample programs and computer output using SAS Stata and R as well as data sets and supplemental slides to facilitate a complete understanding of the material With its strong emphasis on multidisciplinary applications and the interpretation of results Applied Longitudinal Analysis Second Edition is an excellent book for courses on statistics in the health and medical sciences at the upper undergraduate and graduate levels The book also serves as a valuable reference for researchers and professionals in the medical public health and pharmaceutical fields as well as those in social and behavioral sciences who would like to learn more about analyzing longitudinal data *Matrix Analysis for Statistics* James R. Schott, 2016-05-31 An up to date version of the complete self contained introduction to matrix analysis theory and practice Providing accessible and in depth coverage of the most common matrix methods now used in statistical applications Matrix Analysis for Statistics Third Edition features an easy to follow theorem proof format Featuring smooth transitions between topical coverage the author carefully justifies the step by step process of the most common matrix methods now used in statistical applications including eigenvalues and eigenvectors the Moore Penrose inverse matrix differentiation and the distribution of quadratic forms An ideal introduction to matrix analysis theory and practice Matrix Analysis for Statistics Third Edition features New chapter or section coverage on inequalities oblique projections and antieigenvalues and antieigenvectors Additional problems and chapter end practice exercises at the end of each chapter Extensive examples that are familiar and easy to understand Self contained chapters for flexibility in topic choice Applications of matrix methods in

least squares regression and the analyses of mean vectors and covariance matrices Matrix Analysis for Statistics Third Edition is an ideal textbook for upper undergraduate and graduate level courses on matrix methods multivariate analysis and linear models The book is also an excellent reference for research professionals in applied statistics James R Schott PhD is Professor in the Department of Statistics at the University of Central Florida He has published numerous journal articles in the area of multivariate analysis Dr Schott's research interests include multivariate analysis analysis of covariance and correlation matrices and dimensionality reduction techniques **Time Series Analysis and Forecasting by Example** Søren Bisgaard, Murat Kulahci, 2011-08-24 An intuition based approach enables you to master time series analysis with ease Time Series Analysis and Forecasting by Example provides the fundamental techniques in time series analysis using various examples By introducing necessary theory through examples that showcase the discussed topics the authors successfully help readers develop an intuitive understanding of seemingly complicated time series models and their implications The book presents methodologies for time series analysis in a simplified example based approach Using graphics the authors discuss each presented example in detail and explain the relevant theory while also focusing on the interpretation of results in data analysis Following a discussion of why autocorrelation is often observed when data is collected in time subsequent chapters explore related topics including Graphical tools in time series analysis Procedures for developing stationary non stationary and seasonal models How to choose the best time series model Constant term and cancellation of terms in ARIMA models Forecasting using transfer function noise models The final chapter is dedicated to key topics such as spurious relationships autocorrelation in regression and multiple time series Throughout the book real world examples illustrate step by step procedures and instructions using statistical software packages such as SAS IMP Minitab SCA and R A related Web site features PowerPoint slides to accompany each chapter as well as the book s data sets With its extensive use of graphics and examples to explain key concepts Time Series Analysis and Forecasting by Example is an excellent book for courses on time series analysis at the upper undergraduate and graduate levels it also serves as a valuable resource for practitioners and researchers who carry out data and time series analysis in the fields of engineering business and economics Statistical Rules of Thumb Gerald van Belle, 2011-09-20 Praise for the First Edition For a beginner this book is a treasure trove for an experienced person it can provide new ideas on how better to pursue the subject of applied statistics Journal of Quality Technology Sensibly organized for guick reference Statistical Rules of Thumb Second Edition compiles simple rules that are widely applicable robust and elegant and each captures key statistical concepts This unique guide to the use of statistics for designing conducting and analyzing research studies illustrates real world statistical applications through examples from fields such as public health and environmental studies Along with an insightful discussion of the reasoning behind every technique this easy to use handbook also conveys the various possibilities statisticians must think of when designing and conducting a study or analyzing its data Each chapter presents clearly defined rules related to inference covariation

experimental design consultation and data representation and each rule is organized and discussed under five succinct headings introduction statement and illustration of the rule the derivation of the rule a concluding discussion and exploration of the concept's extensions. The author also introduces new rules of thumb for topics such as sample size for ratio analysis absolute and relative risk ANCOVA cautions and dichotomization of continuous variables Additional features of the Second Edition include Additional rules on Bayesian topics New chapters on observational studies and Evidence Based Medicine EBM Additional emphasis on variation and causation Updated material with new references examples and sources A related Web site provides a rich learning environment and contains additional rules presentations by the author and a message board where readers can share their own strategies and discoveries Statistical Rules of Thumb Second Edition is an ideal supplementary book for courses in experimental design and survey research methods at the upper undergraduate and graduate levels It also serves as an indispensable reference for statisticians researchers consultants and scientists who would like to develop an understanding of the statistical foundations of their research efforts A related website www vanbelle org provides additional rules author presentations and more Time Series Analysis Wilfredo Palma, 2016-04-29 A modern and accessible guide to the analysis of introductory time series data Featuring an organized and self contained guide Time Series Analysis provides a broad introduction to the most fundamental methodologies and techniques of time series analysis The book focuses on the treatment of univariate time series by illustrating a number of well known models such as ARMA and ARIMA Providing contemporary coverage the book features several useful and newlydeveloped techniques such as weak and strong dependence Bayesian methods non Gaussian data local stationarity missing values and outliers and threshold models Time Series Analysis includes practical applications of time series methods throughout as well as Real world examples and exercise sets that allow readers to practice the presented methods and techniques Numerous detailed analyses of computational aspects related to the implementation of methodologies including algorithm efficiency arithmetic complexity and process time End of chapter proposed problems and bibliographical notes to deepen readers knowledge of the presented material Appendices that contain details on fundamental concepts and select solutions of the problems implemented throughout A companion website with additional data fi les and computer codes Time Series Analysis is an excellent textbook for undergraduate and beginning graduate level courses in time series as well as a supplement for students in advanced statistics mathematics economics finance engineering and physics The book is also a useful reference for researchers and practitioners in time series analysis econometrics and finance Wilfredo Palma PhD is Professor of Statistics in the Department of Statistics at Pontificia Universidad Cat lica de Chile He has published several refereed articles and has received over a dozen academic honors and awards His research interests include time series analysis prediction theory state space systems linear models and econometrics He is the author of Long Memory Time Series Theory and Methods also published by Wilev Statistical Shape Analysis Ian L. Dryden, Kanti V. Mardia, 2016-09-06 A thoroughly revised and

updated edition of this introduction to modern statistical methods for shape analysis Shape analysis is an important tool in the many disciplines where objects are compared using geometrical features Examples include comparing brain shape in schizophrenia investigating protein molecules in bioinformatics and describing growth of organisms in biology This book is a significant update of the highly regarded Statistical Shape Analysis by the same authors The new edition lays the foundations of landmark shape analysis including geometrical concepts and statistical techniques and extends to include analysis of curves surfaces images and other types of object data Key definitions and concepts are discussed throughout and the relative merits of different approaches are presented The authors have included substantial new material on recent statistical developments and offer numerous examples throughout the text Concepts are introduced in an accessible manner while retaining sufficient detail for more specialist statisticians to appreciate the challenges and opportunities of this new field Computer code has been included for instructional use along with exercises to enable readers to implement the applications themselves in R and to follow the key ideas by hands on analysis Offers a detailed yet accessible treatment of statistical methods for shape analysis Includes numerous examples and applications from many disciplines Provides R code for implementing the examples Covers a wide variety of recent developments in shape analysis Shape Analysis with Applications in R will offer a valuable introduction to this fast moving research area for statisticians and other applied scientists working in diverse areas including archaeology bioinformatics biology chemistry computer science medicine morphometics and image analysis Nonparametric Hypothesis Testing Stefano Bonnini, Livio Corain, Marco Marozzi, Luigi Salmaso, 2014-07-01 A novel presentation of rank and permutation tests with accessible guidance to applications in R Nonparametric testing problems are frequently encountered in many scientific disciplines such as engineering medicine and the social sciences This book summarizes traditional rank techniques and more recent developments in permutation testing as robust tools for dealing with complex data with low sample size Key Features Examines the most widely used methodologies of nonparametric testing Includes extensive software codes in R featuring worked examples and uses real case studies from both experimental and observational studies Presents and discusses solutions to the most important and frequently encountered real problems in different fields Features a supporting website www wiley com go hypothesis testing containing all of the data sets examined in the book along with ready to use R software codes Nonparametric Hypothesis Testing combines an up to date overview with useful practical guidance to applications in R and will be a valuable resource for practitioners and researchers working in a wide range of scientific fields including engineering biostatistics psychology and medicine Quantile Regression Cristina Davino, Marilena Furno, Domenico Vistocco, 2013-12-31 A guide to the implementation and interpretation of Quantile Regression models This book explores the theory and numerous applications of quantile regression offering empirical data analysis as well as the software tools to implement the methods The main focus of this book is to provide the reader with a comprehensive description of the main issues concerning quantile regression

these include basic modeling geometrical interpretation estimation and inference for quantile regression as well as issues on validity of the model diagnostic tools Each methodological aspect is explored and followed by applications using real data Quantile Regression Presents a complete treatment of quantile regression methods including estimation inference issues and application of methods Delivers a balance between methodolgy and application Offers an overview of the recent developments in the quantile regression framework and why to use quantile regression in a variety of areas such as economics finance and computing Features a supporting website www wiley com go quantile regression hosting datasets along with R Stata and SAS software code Researchers and PhD students in the field of statistics economics econometrics social and environmental science and chemistry will benefit from this book **Statistical Analysis of Designed Experiments** Ajit C. Tamhane, 2012-09-12 A indispensable guide to understanding and designing modern experiments The tools and techniques of Design of Experiments DOE allow researchers to successfully collect analyze and interpret data across a wide array of disciplines Statistical Analysis of Designed Experiments provides a modern and balanced treatment of DOE methodology with thorough coverage of the underlying theory and standard designs of experiments guiding the reader through applications to research in various fields such as engineering medicine business and the social sciences The book supplies a foundation for the subject beginning with basic concepts of DOE and a review of elementary normal theory statistical methods Subsequent chapters present a uniform model based approach to DOE Each design is presented in a comprehensive format and is accompanied by a motivating example discussion of the applicability of the design and a model for its analysis using statistical methods such as graphical plots analysis of variance ANOVA confidence intervals and hypothesis tests Numerous theoretical and applied exercises are provided in each chapter and answers to selected exercises are included at the end of the book An appendix features three case studies that illustrate the challenges often encountered in real world experiments such as randomization unbalanced data and outliers Minitab software is used to perform analyses throughout the book and an accompanying FTP site houses additional exercises and data sets With its breadth of real world examples and accessible treatment of both theory and applications Statistical Analysis of Designed Experiments is a valuable book for experimental design courses at the upper undergraduate and graduate levels It is also an indispensable reference for practicing statisticians engineers and scientists who would like to further their knowledge of DOE **Response Surface** Methodology Raymond H. Myers, Douglas C. Montgomery, Christine M. Anderson-Cook, 2016-01-04 Praise for the Third Edition This new third edition has been substantially rewritten and updated with new topics and material new examples and exercises and to more fully illustrate modern applications of RSM Zentralblatt Math Featuring a substantial revision the Fourth Edition of Response Surface Methodology Process and Product Optimization Using Designed Experiments presents updated coverage on the underlying theory and applications of response surface methodology RSM Providing the assumptions and conditions necessary to successfully apply RSM in modern applications the new edition covers classical and

modern response surface designs in order to present a clear connection between the designs and analyses in RSM With multiple revised sections with new topics and expanded coverage Response Surface Methodology Process and Product Optimization Using Designed Experiments Fourth Edition includes Many updates on topics such as optimal designs optimization techniques robust parameter design methods for design evaluation computer generated designs multiple response optimization and non normal responses Additional coverage on topics such as experiments with computer models definitive screening designs and data measured with error Expanded integration of examples and experiments which present up to date software applications such as IMP SAS and Design Expert throughout An extensive references section to help readers stay up to date with leading research in the field of RSM An ideal textbook for upper undergraduate and graduate level courses in statistics engineering and chemical physical sciences Response Surface Methodology Process and Product Optimization Using Designed Experiments Fourth Edition is also a useful reference for applied statisticians and engineers in disciplines such as quality process and chemistry **Extremes in Random Fields** Benjamin Yakir, 2013-08-01 Presents a useful new technique for analyzing the extreme value behaviour of random fields Modern science typically involves the analysis of increasingly complex data The extreme values that emerge in the statistical analysis of complex data are often of particular interest This book focuses on the analytical approximations of the statistical significance of extreme values Several relatively complex applications of the technique to problems that emerge in practical situations are presented All the examples are difficult to analyze using classical methods and as a result the author presents a novel technique designed to be more accessible to the user Extreme value analysis is widely applied in areas such as operational research bioinformatics computer science finance and many other disciplines This book will be useful for scientists engineers and advanced graduate students who need to develop their own statistical tools for the analysis of their data Whilst this book may not provide the reader with the specific answer it will inspire them to rethink their problem in the context of random fields apply the method Generalized Linear Models Raymond H. Myers, Douglas C. Montgomery, G. Geoffrey and produce a solution Vining, Timothy J. Robinson, 2012-01-20 Praise for the First Edition The obvious enthusiasm of Myers Montgomery and Vining and their reliance on their many examples as a major focus of their pedagogy make Generalized Linear Models a joy to read Every statistician working in any area of applied science should buy it and experience the excitement of these new approaches to familiar activities Technometrics Generalized Linear Models With Applications in Engineering and the Sciences Second Edition continues to provide a clear introduction to the theoretical foundations and key applications of generalized linear models GLMs Maintaining the same nontechnical approach as its predecessor this update has been thoroughly extended to include the latest developments relevant computational approaches and modern examples from the fields of engineering and physical sciences This new edition maintains its accessible approach to the topic by reviewing the various types of problems that support the use of GLMs and providing an overview of the basic related concepts such as

multiple linear regression nonlinear regression least squares and the maximum likelihood estimation procedure Incorporating the latest developments new features of this Second Edition include A new chapter on random effects and designs for GLMs A thoroughly revised chapter on logistic and Poisson regression now with additional results on goodness of fit testing nominal and ordinal responses and overdispersion A new emphasis on GLM design with added sections on designs for regression models and optimal designs for nonlinear regression models Expanded discussion of weighted least squares including examples that illustrate how to estimate the weights Illustrations of R code to perform GLM analysis The authors demonstrate the diverse applications of GLMs through numerous examples from classical applications in the fields of biology and biopharmaceuticals to more modern examples related to engineering and quality assurance The Second Edition has been designed to demonstrate the growing computational nature of GLMs as SAS Minitab JMP and R software packages are used throughout the book to demonstrate fitting and analysis of generalized linear models perform inference and conduct diagnostic checking Numerous figures and screen shots illustrating computer output are provided and a related FTP site houses supplementary material including computer commands and additional data sets Generalized Linear Models Second Edition is an excellent book for courses on regression analysis and regression modeling at the upper undergraduate and graduate level It also serves as a valuable reference for engineers scientists and statisticians who must understand and apply GLMs in their work Smoothing of Multivariate Data Jussi Sakari Klemelä, 2009-09-04 An applied treatment of the key methods and state of the art tools for visualizing and understanding statistical data Smoothing of Multivariate Data provides an illustrative and hands on approach to the multivariate aspects of density estimation emphasizing the use of visualization tools Rather than outlining the theoretical concepts of classification and regression this book focuses on the procedures for estimating a multivariate distribution via smoothing The author first provides an introduction to various visualization tools that can be used to construct representations of multivariate functions sets data and scales of multivariate density estimates Next readers are presented with an extensive review of the basic mathematical tools that are needed to asymptotically analyze the behavior of multivariate density estimators with coverage of density classes lower bounds empirical processes and manipulation of density estimates The book concludes with an extensive toolbox of multivariate density estimators including anisotropic kernel estimators minimization estimators multivariate adaptive histograms and wavelet estimators A completely interactive experience is encouraged as all examples and figurescan be easily replicated using the R software package and every chapter concludes with numerous exercises that allow readers to test their understanding of the presented techniques The R software is freely available on the book s related Web site along with Code sections for each chapter that provide short instructions for working in the R environment Combining mathematical analysis with practical implementations Smoothing of Multivariate Data is an excellent book for courses in multivariate analysis data analysis and nonparametric statistics at the upper undergraduate and graduatelevels It also serves as a valuable reference for

practitioners and researchers in the fields of statistics computer science economics and engineering Experiments C. F. Jeff Wu, Michael S. Hamada, 2011-09-20 Praise for the First Edition If you want an up to date definitive reference written by authors who have contributed much to this field then this book is an essential addition to your library Journal of the American Statistical Association Fully updated to reflect the major progress in the use of statistically designed experiments for product and process improvement Experiments Second Edition introduces some of the newest discoveries and sheds further light on existing ones on the design and analysis of experiments and their applications in system optimization robustness and treatment comparison Maintaining the same easy to follow style as the previous edition while also including modern updates this book continues to present a new and integrated system of experimental design and analysis that can be applied across various fields of research including engineering medicine and the physical sciences The authors modernize accepted methodologies while refining many cutting edge topics including robust parameter design reliability improvement analysis of non normal data analysis of experiments with complex aliasing multilevel designs minimum aberration designs and orthogonal arrays Along with a new chapter that focuses on regression analysis the Second Edition features expanded and new coverage of additional topics including Expected mean squares and sample size determination One way and two way ANOVA with random effects Split plot designs ANOVA treatment of factorial effects Response surface modeling for related factors Drawing on examples from their combined years of working with industrial clients the authors present many cutting edge topics in a single easily accessible source Extensive case studies including goals data and experimental designs are also included and the book s data sets can be found on a related FTP site along with additional supplemental material Chapter summaries provide a succinct outline of discussed methods and extensive appendices direct readers to resources for further study Experiments Second Edition is an excellent book for design of experiments courses at the upper undergraduate and graduate levels It is also a valuable resource for practicing engineers and statisticians

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