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An Introduction to Statistical Learning provides an accessible overview of the field of statistical learning, an essential toolset for making sense of the vast and complex data sets that have emerged in fields ranging from biology to finance to marketing to astrophysics in the past twenty years. This book presents some of the most important modeling and prediction techniques, along with relevant applications. Topics include linear regression, classification, resampling methods, shrinkage approaches, tree-based methods, support vector machines, clustering, and more. Color graphics and real-world examples are used to illustrate the methods presented. Since the goal of this textbook is to facilitate the use of these statistical learning techniques by practitioners in science, industry, and other fields, each chapter contains a tutorial on implementing the analyses and methods presented in R, an extremely popular open source statistical software platform. Two of the authors co-wrote The Elements of Statistical Learning (Hastie, Tibshirani and Friedman, 2nd edition 2009), a popular reference book for statistics and machine learning researchers. An Introduction to Statistical Learning covers many of the same topics, but at a level accessible to a much broader audience. This book is targeted at statisticians and non-statisticians alike who wish to use cutting-edge statistical learning techniques to analyze their data. The text assumes only a previous course in linear regression and no knowledge of matrix algebra. This book presents a concise treatment of stochastic calculus and its applications. It gives a simple but rigorous treatment of the subject including a range of advanced topics, it is useful for practitioners who use advanced theoretical results. It covers advanced applications, such as models in mathematical finance, biology and engineering. Self-contained and unified in presentation, the book contains many solved examples and exercises. It may be used as a textbook by advanced undergraduates and graduate students in stochastic calculus and financial mathematics. It is also suitable for practitioners who wish to gain an understanding or working knowledge of the subject. For mathematicians, this book could be a first text on stochastic calculus; it is good companion to more advanced texts by a way of examples and exercises. For people from other fields, it provides a way to gain a working knowledge of stochastic calculus. It shows all readers the applications of stochastic calculus methods and takes readers to the technical level required in research and sophisticated modelling. This second edition contains a new chapter on bonds, interest rates and their options. New materials include more worked out examples in all chapters, best estimators, more results on change of time, change of measure, random measures, new results on exotic options, FX options, stochastic and implied volatility, models of the age-dependent branching process and the stochastic Lotka-Volterra model in biology, non-linear filtering in engineering and five new figures. Instructors can obtain slides of the text from the author. Morrey spaces were introduced by Charles Morrey to investigate the local behaviour of solutions to second order elliptic partial differential equations. The technique is very useful in many areas in mathematics, in particular in harmonic analysis, potential theory, partial differential equations and mathematical physics. Across two volumes, the authors of Morrey Spaces: Introduction and Applications to Integral Operators and PDE's discuss the current state of art and perspectives of developments of this theory of Morrey spaces, with focus on harmonic analysis in volume I and generalizations and interpolation of Morrey spaces in volume II. Features Provides a 'from-scratch' overview of the topic readable by anyone with an understanding of integration theory Suitable for graduate students, masters course students, and researchers in PDE's or Geometry Replete with exercises and examples to aid the reader's understanding Briefly, we review the basic elements of computability theory and probability theory that are required. Finally, in order to place the subject in the appropriate historical and conceptual context we trace the main roots of Kolmogorov complexity. This way the stage is set for Chapters 2 and 3, where we introduce the notion of optimal effective descriptions of objects. The length

of such a description (or the number of bits of information in it) is its Kolmogorov complexity. We treat all aspects of the elementary mathematical theory of Kolmogorov complexity. This body of knowledge may be called algorithmic complexity theory. The theory of Martin-Lof tests for randomness of finite objects and infinite sequences is inextricably intertwined with the theory of Kolmogorov complexity and is completely treated. We also investigate the statistical properties of finite strings with high Kolmogorov complexity. Both of these topics are eminently useful in the applications part of the book. We also investigate the recursion theoretic properties of Kolmogorov complexity (relations with Godel's incompleteness result), and the Kolmogorov complexity version of information theory, which we may call "algorithmic information theory" or "absolute information theory." The treatment of algorithmic probability theory in Chapter 4 presupposes Sections 1.6, 1.11.2, and Chapter 3 (at least Sections 3.1 through 3.4).

Introduction to the Theory and Application of Differential Equations with Deviating Arguments 2nd edition is a revised and substantially expanded edition of the well-known book of L. E. El'sgol'ts published under this same title by Nauka in 1964. Extensions of the theory of differential equations with deviating argument as well as the stimuli of developments within various fields of science and technology contribute to the need for a new edition. This theory in recent years has attracted the attention of vast numbers of researchers, interested both in the theory and its applications. The development of the foundations of the theory of differential equations with a deviating argument is still far from complete. This situation, of course, leaves its mark on our suggestions to the reader of the book and prevents as orderly and systematic a presentation as is usual for mathematical literature. However, it is hoped that in spite of these deficiencies the book will prove useful as a first acquaintanceship with the theory of differential equations with a deviating argument. Covering all the essential topics for undergraduate courses, this is the ideal student introduction to game theory. The book sets out the basics of the subject in a non-technical way. All discussion and explanation is clear, well structured, and entirely accessible to students of both economics and business. In addition to describing and explaining the basic theory, Game Theory uses illustrations and examples to show its application to realistic, topical, and interesting problems—ranging from strategic decision-making within companies to international environmental policy-making. The book also features exercises with accompanying solutions to allow the student to check progress throughout the course, and a guide to further reading at the end of each chapter.

An Introduction to Statistical Learning provides an accessible overview of the field of statistical learning, an essential toolset for making sense of the vast and complex data sets that have emerged in fields ranging from biology to finance to marketing to astrophysics in the past twenty years. This book presents some of the most important modeling and prediction techniques, along with relevant applications. Topics include linear regression, classification, resampling methods, shrinkage approaches, tree-based methods, support vector machines, clustering, deep learning, survival analysis, multiple testing, and more. Color graphics and real-world examples are used to illustrate the methods presented. Since the goal of this textbook is to facilitate the use of these statistical learning techniques by practitioners in science, industry, and other fields, each chapter contains a tutorial on implementing the analyses and methods presented in R, an extremely popular open source statistical software platform. Two of the authors co-wrote The Elements of Statistical Learning (Hastie, Tibshirani and Friedman, 2nd edition 2009), a popular reference book for statistics and machine learning researchers. An Introduction to Statistical Learning covers many of the same topics, but at a level accessible to a much broader audience. This book is targeted at statisticians and non-statisticians alike who wish to use cutting-edge statistical learning techniques to analyze their data. The text assumes only a previous course in linear regression and no knowledge of matrix algebra. This Second Edition features new chapters on deep learning, survival analysis, and multiple testing, as well as expanded treatments of naïve Bayes, generalized linear models, Bayesian additive regression trees, and matrix completion. R code has been updated throughout to ensure compatibility. This volume provides an introduction to the properties of functional differential equations and their applications in diverse fields such as immunology, nuclear power generation, heat transfer, signal processing, medicine and economics. In particular, it deals with problems and methods relating to systems having a memory (hereditary systems). The book contains eight chapters. Chapter 1 explains where functional differential equations come from and what sort of problems arise in applications. Chapter 2 gives a broad introduction to the basic principle involved and deals with systems having discrete and distributed delay. Chapters 3-5 are devoted to stability problems for retarded, neutral and stochastic functional differential equations. Problems of optimal control and estimation are considered in Chapters 6-8. For applied mathematicians, engineers, and physicists whose work involves mathematical modeling of hereditary systems. This volume can also be recommended as a supplementary text for graduate students who wish to become better acquainted with the properties and applications of functional differential equations. This second edition explains what automated reasoning is and what it can do, and then demonstrates how to use it to solve complex problems with applications in logic circuit design, circuit validation, real-time system design, and expert systems.

Introduction to Fluoropolymers, Second Edition, provides a comprehensive overview of the history, principles, properties, processing and applications of fluoropolymers, supporting their development and utilization in high-performance applications, components, and products. This second edition has been updated and expanded to include new in-depth chapters on manufacturing and applications of PTFE and melt processible fluoropolymers. The book begins by demonstrating the role of fluoropolymers in everyday life, before introducing the history and basic principles of fluoropolymers. This is followed by detailed coverage of the main fluoropolymer types. Properties and applications are illustrated by real-world examples as diverse as waterproof clothing, vascular grafts and coatings for aircraft interiors. The different applications of fluoropolymers show the benefits of a group of materials that are highly water-repellant and flame-retardant, with unrivalled lubrication properties and a high level of biocompatibility. Health and safety and environmental aspects are also covered throughout the book, with a final chapter examining safety, disposal, and recycling in detail. This book is an essential resource for anyone looking to understand or use fluoropolymer materials in their products. This includes engineers, product designers, manufacturers, scientists, researchers, and other professionals, across industries such as automotive, aerospace, medical devices, food and beverages, high performance apparel, oil and gas, renewable energy, solar photovoltaics, electronics and semiconductors, pharmaceuticals, and chemical processing. This is also a valuable introductory guide for academic researchers and advanced students in plastics engineering, polymer science, and materials science. Introduces and demystifies fluoropolymers for a wide audience of engineers, designers, professionals, and researchers, across industries and disciplines. Covers a broad range of materials, including polytetrafluoroethylene (PTFE), polyvinyl fluoride (PVF), vinylidene fluoride polymers, fluoroelastomers, and more. Focuses on properties, processing methods and advanced industrial applications of fluoropolymers. Geared toward advanced undergraduate and graduate engineering students, this text introduces the theory and applications of optimal control. It serves as a bridge to the technical literature, enabling students to evaluate the implications of theoretical control work, and to judge the merits of papers on the subject. Rather than presenting an exhaustive treatise, Optimal Control offers a detailed introduction that fosters careful thinking and disciplined intuition. It develops the basic mathematical background, with a coherent formulation of the control problem and discussions of the necessary conditions for optimality based on the maximum principle of Pontryagin. In-depth examinations cover applications of the theory to minimum time, minimum fuel, and to quadratic criteria problems. The structure, properties, and engineering realizations of several optimal feedback control systems also receive attention. Special features include numerous specific problems, carried through to engineering realization in block diagram form. The text treats almost all current examples of control problems that permit analytic solutions, and its unified approach makes frequent use of geometric ideas to encourage students' intuition. Master the principles of logic design with the exceptional balance of theory and application found in Roth/Kinney/John's FUNDAMENTALS OF LOGIC DESIGN, ENHANCED, 7th Edition. This edition introduces you to today's latest advances. The authors have carefully developed a clear presentation that introduces the fundamental concepts of logic design without overwhelming you with the mathematics of switching theory. Twenty engaging, easy-to-follow study units present basic concepts, such as Boolean algebra, logic gate design, flip-flops and state machines. You learn to design counters, adders, sequence detectors and simple digital systems. After mastering the basics, you progress to modern design techniques using programmable logic devices as well as VHDL hardware description language.

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Introduction to Space Sciences and Spacecraft Applications This book explores the concepts of data mining and data warehousing, a promising and flourishing frontier in database systems, and presents a broad, yet in-depth overview of the field of data mining. Data mining is a multidisciplinary field, drawing work from areas including database technology, artificial intelligence, machine learning, neural networks, statistics, pattern recognition, knowledge based systems, knowledge acquisition, information retrieval, high performance computing and data visualization. Medical electronics, or more specifically the instrumentation used in physiological measurement, has changed significantly over the last few years. Developments in electronics technology have offered new and enhanced applications, especially in the areas of data recording and analysis and imaging technology. These changes have been accompanied by more stringent legislation on safety and liability. This book is designed to meet the needs of students on the growing number of courses, undergraduate and MSc. It is a concise and accessible introduction offering a broad overview that encompasses the various contributing disciplines. Designed for the newest version of the popular MATLAB software program, MATLAB: An Introduction with Applications, 3/e requires no previous knowledge of computer programming. The first chapter describes basic features of the program and shows how to use it in simple arithmetic operations with scalars. The next two chapters focus on the topic of arrays (the basis of MATLAB), while

the remaining text covers a wide range of other applications. Computer screens, tutorials, samples, and homework questions in math, science, and engineering, provide the student with the practical hands-on experience needed for total proficiency. Introduction to Machine Learning with Applications in Information Security provides a class-tested introduction to a wide variety of machine learning algorithms, reinforced through realistic applications. The book is accessible and doesn't prove theorems, or otherwise dwell on mathematical theory. The goal is to present topics at an intuitive level, with just enough detail to clarify the underlying concepts. The book covers core machine learning topics in-depth, including Hidden Markov Models, Principal Component Analysis, Support Vector Machines, and Clustering. It also includes coverage of Nearest Neighbors, Neural Networks, Boosting and AdaBoost, Random Forests, Linear Discriminant Analysis, Vector Quantization, Naive Bayes, Regression Analysis, Conditional Random Fields, and Data Analysis. Most of the examples in the book are drawn from the field of information security, with many of the machine learning applications specifically focused on malware. The applications presented are designed to demystify machine learning techniques by providing straightforward scenarios. Many of the exercises in this book require some programming, and basic computing concepts are assumed in a few of the application sections. However, anyone with a modest amount of programming experience should have no trouble with this aspect of the book. Instructor resources, including PowerPoint slides, lecture videos, and other relevant material are provided on an accompanying website: <http://www.cs.sjsu.edu/~stamp/ML/>. For the reader's benefit, the figures in the book are also available in electronic form, and in color.

About the Author Mark Stamp has been a Professor of Computer Science at San Jose State University since 2002. Prior to that, he worked at the National Security Agency (NSA) for seven years, and a Silicon Valley startup company for two years. He received his Ph.D. from Texas Tech University in 1992. His love affair with machine learning began in the early 1990s, when he was working at the NSA, and continues today at SJSU, where he has supervised vast numbers of master's student projects, most of which involve a combination of information security and machine learning. Based on a Cal Tech course, this is an outstanding introduction to formal quantum mechanics for advanced undergraduates in applied physics. The treatment's exploration of a wide range of topics culminates in two eminently practical subjects, the semiconductor transistor and the laser. Each chapter concludes with a set of problems. 1982 edition. The favourable reception of the first edition and the encouragement received from many readers have prompted the author to bring out this new edition. This provides the opportunity for correcting a number of errors, typographical and others, contained in the first edition and making further improvements. This second edition has a new chapter on simplifying Dynamical Systems covering Poincare map, Floquet theory, Centre Manifold Theorems, normal forms of dynamical systems, elimination of passive coordinates and Liapunov-Schmidt reduction theory. It would provide a gradual transition to the study of Bifurcation, Chaos and Catastrophe in Chapter 10. Apart from this, most others - in fact all except the first three and last chapters - have been revised and enlarged to bring in some new materials, elaborate some others, especially those sections which many readers felt were rather too concise in the first edition, by providing more explanation, examples and applications. Chapter 11 provides some good examples of this. Another example may be found in Chapter 4 where the review of Linear Algebra has been enlarged to incorporate further materials needed in this edition, for example the last section on idempotent matrices and projection would prove very useful to follow Liapunov-Schmidt reduction theory presented in Chapter 9.

Psycholinguistics: Introduction and Applications, Second Edition is the first textbook in psycholinguistics created for working language professionals and students in speech-language pathology and language education, as well as for students in psychology and linguistics. It provides a clear, lively introduction to research and ideas about how human brains process language in speaking, understanding, and reading. Within a unifying framework of the constant interplay of bottom-up (sensory) and top-down (knowledge-based) processing across all language uses and modalities, it is an integrated, self-contained, fully updated account of psycholinguistics and its clinical and pedagogical applications. In this second edition, author Lise Menn is joined by leading brain researcher and aphasiologist, Nina Dronkers. The significantly revised brain chapter contains current findings on brain structure and function, including the roles of newly delineated fiber tracts and language areas outside Broca's and Wernicke's areas. Fully-explained examples are taken from Spanish and other languages as well as English. Five core chapters (language description; brain structure and function; pragmatic and semantic stages of speech production; syntactic, morphological, phonological, and phonetic stages of speech production; and experimental psycholinguistics) form the foundation for chapters, presenting classic and recent research on aphasia, first language development, reading, and second language learning. A final chapter demonstrates how linguistics and psycholinguistics can and should inform classroom and clinical practice in test design and error analysis, while also explaining the care that must be taken in translating theoretically based ideas into such real-world applications. Concepts from linguistics, neurology, and experimental psychology are kept vivid by illustrations of their uses in the real world, the clinic, and language teaching. Technical terms are clearly explained in context and also in a large reference glossary. Disclaimer: Please note that ancillary content (such as documents, audio, and video, etc.) may not be included as published in the original print version of this book.

This text describes the mathematical formulation and proof of the unified mechanics theory (UMT) which is based on the unification of Newton's laws and the laws of thermodynamics. It also presents formulations and experimental verifications of the theory for thermal, mechanical, electrical, corrosion, chemical and fatigue loads, and it discusses why the original universal laws of motion proposed by Isaac Newton in 1687 are incomplete. The author provides concrete examples, such as how Newton's second law,  $F = ma$ , gives the initial acceleration of a soccer ball kicked by a player, but does not tell us how and when the ball would come to a stop. Over the course of Introduction to Unified Mechanics Theory, Dr. Basaran illustrates that Newtonian mechanics does not account for the thermodynamic changes happening in a system over its usable lifetime. And in this context, this book explains how to design a system to perform its intended functions safely over its usable life time and predicts the expected lifetime of the system without using empirical models, a process currently done using Newtonian mechanics and empirical degradation/failure/fatigue models which are curve-fit to test data. Written as a textbook suitable for upper-level undergraduate mechanics courses, as well as first year graduate level courses, this book is the result of over 25 years of scientific activity with the contribution of dozens of scientists from around the world including USA, Russia, Ukraine, Belarus, Spain, China, India and U.K. An integrated package of powerful probabilistic tools and key applications in modern mathematical data science.

Introduction to Satellite Remote Sensing: Atmosphere, Ocean and Land Applications is the first reference book to cover ocean applications, atmospheric applications, and land applications of remote sensing. Applications of remote sensing data are finding increasing application in fields as diverse as wildlife ecology and coastal recreation management. The technology engages electromagnetic sensors to measure and monitor changes in the earth's surface and atmosphere. The book opens with an introduction to the history of remote sensing, starting from when the phrase was first coined. It goes on to discuss the basic concepts of the various systems, including atmospheric and ocean, then closes with a detailed section on land applications. Due to the cross disciplinary nature of the authors' experience and the content covered, this is a must have reference book for all practitioners and students requiring an introduction to the field of remote sensing. Provides study questions at the end of each chapter to aid learning Covers all satellite remote sensing technologies, allowing readers to use the text as instructional material Includes the most recent technologies and their applications, allowing the reader to stay up-to-date Delves into laser sensing (LIDAR) and commercial satellites (DigitalGlobe) Presents examples of specific satellite missions, including those in which new technology has been introduced The book's contributing authors are among the top researchers in swarm intelligence. The book is intended to provide an overview of the subject to novices, and to offer researchers an update on interesting recent developments. Introductory chapters deal with the biological foundations, optimization, swarm robotics, and applications in new-generation telecommunication networks, while the second part contains chapters on more specific topics of swarm intelligence research.

This book presents an introduction to MATLAB and its applications in engineering problem solving. It is designed as an introductory course in MATLAB for engineers. The classical methods of electrical circuits, control systems, numerical methods, optimization, direct numerical integration methods, engineering mechanics and mechanical vibrations are covered using MATLAB software. The numerous worked examples and unsolved exercise problems are intended to provide the reader with an awareness of the general applicability to electrical circuits, control systems, numerical methods, optimization, direct numerical integration methods, engineering mechanics and mechanical vibrations using MATLAB Includes one IBM/PC floppy disk. System Requirements: Monochrome monitors, IBM-compatible machines, minimum: 286 IBM, DOS 2.0 or higher. This book gives a complete, concise introduction to the theory and applications of linear programming. It emphasizes the practical applications of mathematics, and makes the subject more accessible to individuals with varying mathematical abilities. It is one of the first rigorous linear programming texts that does not require linear algebra as a prerequisite. In addition, this text contains a floppy disk containing the program SIMPLEX, designed to help students solve problems using the computer. Key Features \* Less rigorous mathematically - will appeal to individuals with varying mathematical abilities \* Includes a floppy disk containing the program SIMPLEX and an appendix to help students solve problems using the computer \* Includes chapters on network analysis and dynamic programming - topics of great interest to business majors and industrial engineers \* Includes modem applications - selected computer programs for solving various max/min applications Fuzzy logic provides a unique method of approximate reasoning in an imperfect world. This text is a bridge to the principles of fuzzy logic through an application-focused approach to selected topics in Engineering and Management. The many examples point to the richer solutions obtained through fuzzy logic and to the possibilities of much wider applications. There are

relatively few texts available at present in fuzzy logic applications. The style and content of this text is complementary to those already available. New areas of application are presented in a graded approach in which the underlying concepts are first described. The text is broadly divided into two parts which treat Processes and Materials and also System Applications. The level enables a selection of the text to be made for the substance of a senior undergraduate level course. There is also sufficient volume and quality for the basis of a postgraduate course. A more restricted and judicious selection can provide the material for a professional short course. MATLAB: An Introduction with Applications 4th Edition walks readers through the ins and outs of this powerful software for technical computing. The first chapter describes basic features of the program and shows how to use it in simple arithmetic operations with scalars. The next two chapters focus on the topic of arrays (the basis of MATLAB), while the remaining text covers a wide range of other applications. MATLAB: An Introduction with Applications 4th Edition is presented gradually and in great detail, generously illustrated through computer screen shots and step-by-step tutorials, and applied in problems in mathematics, science, and engineering. Random variables. Probability generating functions. Exponential-type distributions and maximum likelihood estimation. Branching process, random walk and ruin problem. Markov chains. Algebraic treatment of finite Markov chains. Renewal processes. Some stochastic models of population growth. A general birth process, an equality and an epidemic model. Birth-death processes and queueing processes. A simple illness-death process - fix-neyman processes. Multiple transition probabilities in the simple illness death process. Multiple transition time in the simple illness death process - an alternating renewal process. The kolmogorov differential equations and finite markov processes. Kolmogorov differential equations and finite markov processes - continuation. A general illness-death process. Migration processes and birth-illness-death processes. Matrices can be studied in different ways. They are a linear algebraic structure and have a topological/analytical aspect (for example, the normed space of matrices) and they also carry an order structure that is induced by positive semidefinite matrices. The interplay of these closely related structures is an essential feature of matrix analysis. This book explains these aspects of matrix analysis from a functional analysis point of view. After an introduction to matrices and functional analysis, it covers more advanced topics such as matrix monotone functions, matrix means, majorization and entropies. Several applications to quantum information are also included. Introduction to Matrix Analysis and Applications is appropriate for an advanced graduate course on matrix analysis, particularly aimed at studying quantum information. It can also be used as a reference for researchers in quantum information, statistics, engineering and economics. This book introduces the reader to the basic concepts of the generation and manipulation of synchrotron light, its interaction with matter, and the application of synchrotron light in the "classical" techniques, while including some of the most modern technological developments. As much as possible, complicated mathematical derivations and formulas are avoided. A more heuristic approach is adopted, whereby the general physical reasoning behind the equations is highlighted. Key features: A general introduction to synchrotron radiation and experimental techniques using synchrotron radiation Contains many detailed "worked examples" from the literature Of interest for a broad audience - synchrotrons are possibly one of the best examples of multidisciplinary research Four-colour presentation throughout Introduction to Group Theory with Applications covers the basic principles, concepts, mathematical proofs, and applications of group theory. This book is divided into 13 chapters and begins with discussions of the elementary topics related to the subject, including symmetry operations and group concepts. The succeeding chapters deal with the properties of matrix representations of finite groups, the vibrations of molecular and crystals, vibrational wave function, selection rules, and molecular approximations. These topics are followed by reviews of the basic of quantum mechanics, crystal field theory, atomic physics, hybrid functions, and molecular orbital theory. The last chapters describe the symmetry of crystal lattices, the band theory of solids, and the full rotation group. This book will be of value to undergraduate mathematics and physics students. Written by a university lecturer with more than forty years experience in plasma technology, this book adopts a didactic approach in its coverage of the theory, engineering and applications of technological plasmas. The theory is developed in a unified way to enable brevity and clarity, providing readers with the necessary background to assess the factors that affect the behavior of plasmas under different operating conditions. The major part of the book is devoted to the applications of plasma technology and their accompanying engineering aspects, classified by the various pressure and density regimes at which plasmas can be produced. Two chapters on plasma power supplies round off the book. With its broad range of topics, from low to high pressure plasmas, from characterization to modeling, and from materials to components, this is suitable for advanced undergraduates, postgraduates and professionals in the field. Text Analytics: An Introduction to the Science and Applications of Unstructured Information Analysis is a concise and accessible introduction to the science and applications of text analytics (or text mining), which enables automatic knowledge discovery from unstructured information sources, for both industrial and academic purposes. The book introduces the main concepts, models, and computational techniques that enable the reader to solve real decision-making problems arising from textual and/or documentary sources. Features: Easy-to-follow step-by-step concepts and methods Every chapter is introduced in a very gentle and intuitive way so students can understand the WHYs, WHAT-IFs, WHAT-IS-THIS-FORs, HOWs, etc. by themselves Practical programming exercises in Python for each chapter Includes theory and practice for every chapter, summaries, practical coding exercises for target problems, QA, and sample code and data available for download at <https://www.routledge.com/Atkinson-Abutridy/p/book/9781032249797> This is the third edition of the book. In addition to introducing the main concepts of modern algebra, new topic are added: categories and functors; an introduction to representations of finite groups; projective and injective modules; an introduction to noetherian rings and modules and to Hilbert's Nullstellensatz. There is ample material for a two semester course in abstract algebra. This book gives an introduction to the basic theory of stochastic calculus and its applications. Examples are given throughout the text, in order to motivate and illustrate the theory and show its importance for many applications in e.g. economics, biology and physics. The basic idea of the presentation is to start from some basic results (without proofs) of the easier cases and develop the theory from there, and to concentrate on the proofs of the easier case (which nevertheless are often sufficiently general for many purposes) in order to be able to reach quickly the parts of the theory which is most important for the applications. For the 6th edition the author has added further exercises and, for the first time, solutions to many of the exercises are provided. This corrected 6th printing of the 6th edition contains additional corrections and useful improvements, based in part on helpful comments from the readers. Introduction to Graphene: Chemical and Biochemical Applications addresses a broad range of graphene research, including the prehistory and background of graphene, synthetic approaches, characterization techniques, composites/derivatives, inorganic graphene analogues, and applications of graphene. The book's special emphasis on solution chemistry and graphene sets it apart from less practical titles in that its concepts are immediately implementable in the laboratories of chemists and biochemists. The book presents a variety of experimental approaches from the authors' research laboratories and others around the world for graphene preparation in the solution phase, especially under aqueous conditions or in animal serum—the most practical kind of graphene for chemists and biochemists. The book is ideally suited for a broad range of readers, including advanced undergraduates, graduate research students and professionals in state-of-the-art research labs who want to use graphene to develop novel applications. Features reviews of the most recent advances in graphene research across chemistry and biochemistry Emphasizes chemical and biological applications for specialists, aiding more multi-disciplinary research Presents a variety of experimental approaches for graphene preparation in the solution phase, especially under aqueous conditions or even in animal serum This 2003 edition is ideal for use in undergraduate and introductory graduate level courses in complex variables. This accessible and classroom-tested textbook/reference presents an introduction to the fundamentals of the emerging and interdisciplinary field of data science. The coverage spans key concepts adopted from statistics and machine learning, useful techniques for graph analysis and parallel programming, and the practical application of data science for such tasks as building recommender systems or performing sentiment analysis. Topics and features: provides numerous practical case studies using real-world data throughout the book; supports understanding through hands-on experience of solving data science problems using Python; describes techniques and tools for statistical analysis, machine learning, graph analysis, and parallel programming; reviews a range of applications of data science, including recommender systems and sentiment analysis of text data; provides supplementary code resources and data at an associated website.

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