

## Thinking Statistically

Major New York Times bestseller Winner of the National Academy of Sciences Best Book Award in 2012 Selected by the New York Times Book Review as one of the ten best books of 2011 A Globe and Mail Best Books of the Year 2011 Title One of The Economist's 2011 Books of the Year One of The Wall Street Journal's Best Nonfiction Books of the Year 2011 2013 Presidential Medal of Freedom Recipient Kahneman's work with Amos Tversky is the subject of Michael Lewis's The Undoing Project: A Friendship That Changed Our Minds In the international bestseller, Thinking, Fast and Slow, Daniel Kahneman, the renowned psychologist and winner of the Nobel Prize in Economics, takes us on a groundbreaking tour of the mind and explains the two systems that drive the way we think. System 1 is fast, intuitive, and emotional; System 2 is slower, more deliberative, and more logical. The impact of overconfidence on corporate strategies, the difficulties of predicting what will make us happy in the future, the profound effect of cognitive biases on everything from playing the stock market to planning our next vacation—each of these can be understood only by knowing how the two systems shape our judgments and decisions. Engaging the reader in a lively conversation about how we think, Kahneman reveals where we can and cannot trust our intuitions and how we can tap into the benefits of slow thinking. He offers practical and enlightening insights into how choices are made in both our business and our personal lives—and how we can use different techniques to guard against the mental glitches that often get us into trouble. Winner of the National Academy of Sciences Best Book Award and the Los Angeles Times Book Prize and selected by The New York Times Book Review as one of the ten best books of 2011, Thinking, Fast and Slow is destined to be a classic. The twenty-first century has seen a breathtaking expansion of statistical methodology, both in scope and in influence. 'Big data', 'data science', and 'machine learning' have become familiar terms in the news, as statistical methods are brought to bear upon the enormous data sets of modern science and commerce. How did we get here? And where are we going? This book takes us on an exhilarating journey through the revolution in data analysis following the introduction of electronic computation in the 1950s. Beginning with classical inferential theories - Bayesian, frequentist, Fisherian - individual chapters take up a series of influential topics: survival analysis, logistic regression, empirical Bayes, the jackknife and bootstrap, random forests, neural networks, Markov chain Monte Carlo, inference after model selection, and dozens more. The distinctly modern approach integrates methodology and algorithms with statistical inference. The book ends with speculation on the future direction of statistics and data science.

Statistical Power Analysis is a nontechnical guide to power analysis in research planning that provides users of applied statistics with the tools they need for more effective analysis. The Second Edition includes: \* a chapter covering power analysis in set correlation and multivariate methods; \* a chapter considering effect size, psychometric reliability, and the efficacy of "qualifying" dependent variables and; \* expanded power and sample size tables for multiple regression/correlation.

"Introduction to Educational Research: A Critical Thinking Approach 2e is an engaging and informative core text that enables students to think clearly and critically about the scientific process of research. In achieving its goal to make research accessible to all educators and equip them with the skills to understand and evaluate published research, the text examines how educational research is conducted across the major traditions of quantitative, qualitative, mixed methods, and action research. The text is oriented toward consumers of educational research and uses a thinking-skills approach to its coverage of major ideas"--

Statistically Speaking presents a massive collection of quotations pertaining to probability and statistics. Some quotations are profound, others are wise, some are witty, but none are frivolous. Here you will find quotations from the most famous to the unknown. The book is designed to be entertaining and informative so that you can get a feel for

If you know how to program, you have the skills to turn data into knowledge using the tools of probability and statistics. This concise introduction shows you how to perform statistical analysis computationally, rather than mathematically, with programs written in Python. You'll work with a case study throughout the book to help you learn the entire data analysis process—from collecting data and generating statistics to identifying patterns and testing hypotheses. Along the way, you'll become familiar with distributions, the rules of probability, visualization, and many other tools and concepts. Develop your understanding of probability and statistics by writing and testing code Run experiments to test statistical behavior, such as generating samples from several distributions Use simulations to understand concepts that are hard to grasp mathematically Learn topics not usually covered in an introductory course, such as Bayesian estimation Import data from almost any source using Python, rather than be limited to data that has been cleaned and formatted for statistics tools Use statistical inference to answer questions about real-world data

Crime statistics are everywhere, but how do you know when they're valid? If a newspaper report says "the rate of overall violent crime decreased by 0.9 percent," how can you tell where that statistic came from, what it measures, and how accurate it is? Is it worth repeating or sharing? Measuring Crime: Behind the Statistics gives you the tools to interpret and evaluate crime statistics' quality and usefulness. The book focuses on ways of thinking about crime statistics (no formulas!) and features Eight questions you should ask before quoting a statistic The two sources of information about homicide FBI statistics: what do they measure? How victimization surveys can reflect your experiences even though you were not asked to participate Special considerations when interpreting statistics about sexual assault and fraud Examples of experiments and studies on how to improve crime statistics Two online supplements containing additional details and links to data sources Whether you are a law enforcement professional, journalist, student, or interested citizen, Measuring Crime: Behind the Statistics will tell you how to read statistics as a statistician would. Sharon Lohr, the author of Sampling: Design and Analysis, has published widely about statistical methods for education, public policy, law, and crime. She has been recognized as Fellow of the American Statistical Association, elected member of the International Statistical Institute, and recipient of the Gertrude M. Cox Statistics Award and the Deming Lecturer Award. Formerly Dean's Distinguished Professor of Statistics at Arizona State University and a Vice President at Westat, she is now a freelance statistical consultant and writer. Visit her website at [www.sharonlohr.com](http://www.sharonlohr.com). "The book aims to achieve two goals: introduce statistical ideas to a general audience and provide an overview of US crime statistics. These are disparate topics, but in the way they are approached here, there is a strong synergy that reinforces both aspects. One the one hand, the reader's natural curiosity about crime (what is it, how are crime events classified and reported, how reliable are the numbers you see in the newspaper, etc.) will help him/her become interested in the statistical issues and learn these

concepts in a practical and concrete setting. And on the other hand, by reading about the statistical issues surrounding crime data, he/she gains a better appreciation for the complexities of crime statistics, eventually acquiring a deeper understanding of them. As a statistician myself, I learned interesting facts about the types of crime, their nomenclature and the possible confusion surrounding them, and how the data are collected and reported. Overall, I think the combination is effective and very well developed in this book." (Jean Opsomer, Westat) "This book is an excellent primer on handling the mass of data and information researchers are faced with. While it is geared toward followers of criminal justice information, much of the book is a very good introduction to survey techniques discussing their strong and weak points. Most importantly, there are very good guidelines and questions that one should employ before citing any data or using data for policy decisions or for reporting on data such as journalists do. The book is written in a non-technical manner and does a very good job of explaining the nuances in reviewing data. Any researcher who utilizes data would find this valuable. While it has specific examples in the criminal justice field, it really is quite useful for any user of data." (Barry Nussbaum, former President American Statistical Association)

Statistical statements and results are read and used in everyday life and are also presented in the form of charts and diagrams. This book covers basic introductory statistics and brings to light how these statistical results are arrived at, starting with the collection of the data, its organization and summarisation, followed by the mathematical tools used both graphical and analytical to depict, describe, analyse and interpret the data. The book begins with a chapter that discusses what is data, types of data, and examines the difference between data collected for a population as opposed to a sample. The chapters that follow go on to discuss the organisation and summarisation of data in the form of frequency distributions to make it clearer and more manageable to deal with. Also covered are various graphical devices such as bar graphs, pie charts, histograms, frequency polygons, by which data may be depicted to make it easier to visualize and reveal any patterns or trends. Attention is then directed to analytical methods used to describe and characterise data sets by calculating some special numbers called numerical descriptive measures which include measures of central tendency (mean, median, mode), measures of dispersion (range, standard variation, variance), measures of relative standing (percentiles, quartiles, z-scores) and measures of association (coefficient of correlation). The book concludes with a chapter presenting some basic methods of fitting a straight line to a data set that shows a somewhat linear relationship between two variables thus allowing predictions to be made about the value of one variable given the value of the other variable. Within each chapter wherever new statistical terms are introduced for the first time they are identified in bold type and at the end of each chapter these key terms are summarised and defined or explained. There are also various detailed worked examples in each chapter to help the reader improve his/her understanding of the material discussed.

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.

An original account of willful ignorance and how this principle relates to modern probability and statistical methods Through a series of colorful stories about great thinkers and the problems they chose to solve, the author traces the historical evolution of probability and explains how statistical methods have helped to propel scientific research. However, the past success of statistics has depended on vast, deliberate simplifications amounting to willful ignorance, and this very success now threatens future advances in medicine, the social sciences, and other fields. Limitations of existing methods result in frequent reversals of scientific findings and recommendations, to the consternation of both scientists and the lay public. *Willful Ignorance: The Mismeasure of Uncertainty* exposes the fallacy of regarding probability as the full measure of our uncertainty. The book explains how statistical methodology, though enormously productive and influential over the past century, is approaching a crisis. The deep and troubling divide between qualitative and quantitative modes of research, and between research and practice, are reflections of this underlying problem. The author outlines a path toward the re-engineering of data analysis to help close these gaps and accelerate scientific discovery. *Willful Ignorance: The Mismeasure of Uncertainty* presents essential information and novel ideas that should be of interest to anyone concerned about the future of scientific research. The book is especially pertinent for professionals in statistics and related fields, including practicing and research clinicians, biomedical and social science researchers, business leaders, and policy-makers.

Unique in that it collects, presents, and synthesizes cutting edge research on different aspects of statistical reasoning and applies this research to the teaching of statistics to students at all educational levels, this volume will prove of great value to mathematics and statistics education researchers, statistics educators, statisticians, cognitive psychologists, mathematics teachers, mathematics and statistics curriculum developers, and quantitative literacy experts in education and government.

Based on Neil J. Salkind's bestselling text, *Statistics for People Who (Think They) Hate Statistics*, this adapted Excel 2016 version presents an often intimidating and difficult subject in a way that is clear, informative, and personable. Researchers and students uncomfortable with the analysis portion of their work will appreciate the book's unhurried pace and thorough, friendly presentation. Opening with an introduction to Excel 2016, including functions and formulas, this edition shows students how to install the Excel Data

Analysis Tools option to access a host of useful analytical techniques and then walks them through various statistical procedures, beginning with correlations and graphical representation of data and ending with inferential techniques and analysis of variance. New to the Fourth Edition: A new chapter 20 dealing with large data sets using Excel functions and pivot tables, and illustrating how certain databases and other categories of functions and formulas can help make the data in big data sets easier to work with and the results more understandable. New chapter-ending exercises are included and contain a variety of levels of application. Additional TechTalks have been added to help students master Excel 2016. A new, chapter-ending Real World Stats feature shows readers how statistics is applied in the everyday world. Basic maths instruction and practice exercises for those who need to brush up on their math skills are included in the appendix.

Researchers across the natural and social sciences find themselves navigating tremendous amounts of new data. Making sense of this flood of information requires more than the rote application of formulaic statistical methods. The premise of *Statistical Thinking from Scratch* is that students who want to become confident data analysts are better served by a deep introduction to a single statistical method than by a cursory overview of many methods. In particular, this book focuses on simple linear regression—a method with close connections to the most important tools in applied statistics—using it as a detailed case study for teaching resampling-based, likelihood-based, and Bayesian approaches to statistical inference. Considering simple linear regression in depth imparts an idea of how statistical procedures are designed, a flavour for the philosophical positions one assumes when applying statistics, and tools to probe the strengths of one's statistical approach. Key to the book's novel approach is its mathematical level, which is gentler than most texts for statisticians but more rigorous than most introductory texts for non-statisticians. *Statistical Thinking from Scratch* is suitable for senior undergraduate and beginning graduate students, professional researchers, and practitioners seeking to improve their understanding of statistical methods across the natural and social sciences, medicine, psychology, public health, business, and other fields.

Quirks of timing feature in this romantic novel about family connections, second chances, and first loves. Set over a twenty-four-hour-period, Hadley and Oliver find that true love can be unexpected. Today should be one of the worst days of seventeen-year-old Hadley Sullivan's life. Having just missed her flight, she's stuck at JFK airport and late to her father's second wedding, which is taking place in London and involves a soon-to-be stepmother Hadley's never even met. Then she meets the perfect boy in the airport's cramped waiting area. His name is Oliver, he's British, and he's sitting in her row. A long night on the plane passes in the blink of an eye, and Hadley and Oliver lose track of each other in the airport chaos upon arrival. Can fate intervene to bring them together once more? !--EndFragment--

*Thinking Statistically* is the book that shows you how to think like a statistician, without worrying about formal statistical techniques. Along the way we learn how selection bias can explain why your boss doesn't know he sucks (even when everyone else does); how to use Bayes' Theorem to decide if your partner is cheating on you; and why Mark Zuckerberg should never be used as an example for anything. See the world in a whole new light, and make better decisions and judgements without ever going near a t-test. Think. Think Statistically.

Unlock today's statistical controversies and irreproducible results by viewing statistics as probing and controlling errors.

" *Intuitive Biostatistics* takes a non-technical, non-quantitative approach to statistics and emphasizes interpretation of statistical results rather than the computational strategies for generating statistical data. This makes the text especially useful for those in health-science fields who have not taken a biostatistics course before. The text is also an excellent resource for professionals in labs, acting as a conceptually oriented and accessible biostatistics guide. With an engaging and conversational tone, *Intuitive Biostatistics* provides a clear introduction to statistics for undergraduate and graduate students and also serves as a statistics refresher for working scientists. "--

*Past, Present, and Future of Statistical Science* was commissioned in 2013 by the Committee of Presidents of Statistical Societies (COPSS) to celebrate its 50th anniversary and the International Year of Statistics. COPSS consists of five charter member statistical societies in North America and is best known for sponsoring prestigious awards in stat

All business activities are subject to variability. As a consequence, managers and business students need the ability to think statistically about how to deal with the resulting uncertainty and its effect on decision-making in management and commerce. To give them that ability, there is a growing recognition that we must change the way business statistics is taught. Traditional texts tend to focus on probability, mathematical detail, and heavy computation, and thus fail to meet the real needs of future business managers. *Statistical Thinking for Managers* takes a very different, very practical, approach that presents even sophisticated statistics concepts with a minimum of mathematics. It focuses on statistical thinking and discusses a range of topics that specifically apply to managers in business. Its scenario-based, interactive format and integrated use of Excel facilitate and reinforce the learning experience. Through this innovative treatment, readers will gain the ability to: " Appreciate basic statistical ideas " Use a scientific approach to problem solving " Understand the nature of variability " Use meaningful information to make informed decisions " Think in terms of processes and systems and develop strategies for process improvement Designed as an introductory text in business statistics, *Statistical Thinking for Managers* challenges the way students look at business problems and issues. It shows them the importance of statistics in all aspects of business and equips them with the skills they need to make informed and effective decisions.

Apply statistics in business to achieve performance improvement *Statistical Thinking: Improving Business Performance*, 3rd Edition helps managers understand the role of statistics in implementing business improvements. It guides professionals who are learning statistics in order to improve performance in business and industry. It also helps graduate and undergraduate students understand the strategic value of data and statistics in arriving at real business solutions. Instruction in the book is based on principles of effective learning, established by educational and behavioral research. The authors cover both practical examples and underlying theory, both the big picture and necessary details. Readers gain a conceptual understanding and the ability

to perform actionable analyses. They are introduced to data skills to improve business processes, including collecting the appropriate data, identifying existing data limitations, and analyzing data graphically. The authors also provide an in-depth look at JMP software, including its purpose, capabilities, and techniques for use. Updates to this edition include: A new chapter on data, assessing data pedigree (quality), and acquisition tools Discussion of the relationship between statistical thinking and data science Explanation of the proper role and interpretation of p-values (understanding of the dangers of “p-hacking”) Differentiation between practical and statistical significance Introduction of the emerging discipline of statistical engineering Explanation of the proper role of subject matter theory in order to identify causal relationships A holistic framework for variation that includes outliers, in addition to systematic and random variation Revised chapters based on significant teaching experience Content enhancements based on student input This book helps readers understand the role of statistics in business before they embark on learning statistical techniques.

"Using the mathematician's method of analyzing life and exposing the hard-won insights of the academic community to the layman, minus the jargon ... Ellenberg pulls from history as well as from the latest theoretical developments to provide those not trained in math with the knowledge they need"--

The old saying goes, "To the man with a hammer, everything looks like a nail." But anyone who has done any kind of project knows a hammer often isn't enough. The more tools you have at your disposal, the more likely you'll use the right tool for the job - and get it done right. The same is true when it comes to your thinking. The quality of your outcomes depends on the mental models in your head. And most people are going through life with little more than a hammer. Until now. The Great Mental Models: General Thinking Concepts is the first book in The Great Mental Models series designed to upgrade your thinking with the best, most useful and powerful tools so you always have the right one on hand. This volume details nine of the most versatile, all-purpose mental models you can use right away to improve your decision making, productivity, and how clearly you see the world. You will discover what forces govern the universe and how to focus your efforts so you can harness them to your advantage, rather than fight with them or worse yet- ignore them. Upgrade your mental toolbox and get the first volume today. AUTHOR BIOGRAPHY Farnam Street (FS) is one of the world's fastest growing websites, dedicated to helping our readers master the best of what other people have already figured out. We curate, examine and explore the timeless ideas and mental models that history's brightest minds have used to live lives of purpose. Our readers include students, teachers, CEOs, coaches, athletes, artists, leaders, followers, politicians and more. They're not defined by gender, age, income, or politics but rather by a shared passion for avoiding problems, making better decisions, and lifelong learning. AUTHOR HOME Ottawa, Ontario, Canada

Statistics education as proposed in this framework can promote the must-have competencies for graduates to thrive in the modern world.

If you want to outsmart a crook, learn his tricks—Darrell Huff explains exactly how in the classic *How to Lie with Statistics*. From distorted graphs and biased samples to misleading averages, there are countless statistical dodges that lend cover to anyone with an ax to grind or a product to sell. With abundant examples and illustrations, Darrell Huff's lively and engaging primer clarifies the basic principles of statistics and explains how they're used to present information in honest and not-so-honest ways. Now even more indispensable in our data-driven world than it was when first published, *How to Lie with Statistics* is the book that generations of readers have relied on to keep from being fooled.

*Statistical Rethinking: A Bayesian Course with Examples in R* and Stan builds readers' knowledge of and confidence in statistical modeling. Reflecting the need for even minor programming in today's model-based statistics, the book pushes readers to perform step-by-step calculations that are usually automated. This unique computational approach ensures that readers understand enough of the details to make reasonable choices and interpretations in their own modeling work. The text presents generalized linear multilevel models from a Bayesian perspective, relying on a simple logical interpretation of Bayesian probability and maximum entropy. It covers from the basics of regression to multilevel models. The author also discusses measurement error, missing data, and Gaussian process models for spatial and network autocorrelation. By using complete R code examples throughout, this book provides a practical foundation for performing statistical inference. Designed for both PhD students and seasoned professionals in the natural and social sciences, it prepares them for more advanced or specialized statistical modeling. Web Resource The book is accompanied by an R package (rethinking) that is available on the author's website and GitHub. The two core functions (map and map2stan) of this package allow a variety of statistical models to be constructed from standard model formulas.

This book is a strenuous critique of the misinterpretation of statistical knowledge of populations in mainstream psychology, exploring the implications of assuming that those statistics constitute scientific knowledge of individuals. It investigates the essential nature and historical roots of this interpretive practice, and documents the lack of change in mainstream thinking despite previous critiques of the practice. The author contends that prevailing interpretive traditions result in bad science, in that invalid claims are made to knowledge of individuals. He also discusses the socio-ethical problems resulting from this misinterpretation of statistics, where psychological practitioners unjustifiably endorse interventions in the lives of individuals. Lamiell urges psychologists to abandon the aggregate statistical methods which he argues have transformed the field into 'psycho-demography,' and to embrace instead alternative research methods that are logically suited to gaining scientific knowledge about the psychological functioning of individuals. This book concludes by highlighting some of the currently available methodological alternatives, as well as discussing some enduring conceptual impediments to the serious consideration of those alternatives.

INSTANT NEW YORK TIMES BESTSELLER "One of the most important books I've ever read—an indispensable guide to thinking clearly about the world." – Bill Gates "Hans Rosling tells the story of 'the secret silent miracle of human progress' as only he can. But *Factfulness* does much more than that. It also explains why progress is so often secret and silent and teaches readers how to see it clearly." —Melinda Gates "*Factfulness* by Hans Rosling, an outstanding international public health expert, is a hopeful book about the potential for human progress when we work off facts rather than our inherent biases." - Former U.S. President Barack Obama *Factfulness*: The stress-reducing habit of only carrying opinions for which you have strong supporting facts. When asked simple questions about global trends—what percentage of the world's population live in poverty; why the world's population is increasing; how many girls finish school—we systematically get the answers wrong. So wrong that a chimpanzee choosing answers at random will consistently outguess teachers, journalists, Nobel laureates, and investment bankers. In *Factfulness*, Professor of International Health and global TED phenomenon Hans Rosling, together with his two long-time collaborators, Anna and Ola, offers a radical new explanation of why this happens. They reveal the ten instincts that distort our perspective—from our tendency to divide the world into two camps (usually some version of us and them) to the way we consume media (where fear rules) to how we perceive progress (believing that most things are getting worse). Our problem is that we don't know what we don't know, and even our guesses are informed by unconscious and predictable biases. It turns out that the world, for all its imperfections, is in a much better state than we might think. That doesn't mean there aren't real concerns. But when we worry about everything all the time instead of embracing a worldview based on facts, we can lose our ability to

focus on the things that threaten us most. Inspiring and revelatory, filled with lively anecdotes and moving stories, Factfulness is an urgent and essential book that will change the way you see the world and empower you to respond to the crises and opportunities of the future. --- "This book is my last battle in my life-long mission to fight devastating ignorance...Previously I armed myself with huge data sets, eye-opening software, an energetic learning style and a Swedish bayonet for sword-swallowing. It wasn't enough. But I hope this book will be." Hans Rosling, February 2017.

In spite of soaring tuition costs, more and more students go to college every year. A bachelor's degree is now required for entry into a growing number of professions. And some parents begin planning for the expense of sending their kids to college when they're born. Almost everyone strives to go, but almost no one asks the fundamental question posed by Academically Adrift: are undergraduates really learning anything once they get there? For a large proportion of students, Richard Arum and Josipa Roksa's answer to that question is a definitive no. Their extensive research draws on survey responses, transcript data, and, for the first time, the state-of-the-art Collegiate Learning Assessment, a standardized test administered to students in their first semester and then again at the end of their second year. According to their analysis of more than 2,300 undergraduates at twenty-four institutions, 45 percent of these students demonstrate no significant improvement in a range of skills—including critical thinking, complex reasoning, and writing—during their first two years of college. As troubling as their findings are, Arum and Roksa argue that for many faculty and administrators they will come as no surprise—instead, they are the expected result of a student body distracted by socializing or working and an institutional culture that puts undergraduate learning close to the bottom of the priority list. Academically Adrift holds sobering lessons for students, faculty, administrators, policy makers, and parents—all of whom are implicated in promoting or at least ignoring contemporary campus culture. Higher education faces crises on a number of fronts, but Arum and Roksa's report that colleges are failing at their most basic mission will demand the attention of us all.

Thinking StatisticallyCapara Books

From the Nobel Prize-winning author of Thinking, Fast and Slow and the coauthor of Nudge, a revolutionary exploration of why people make bad judgments and how to make better ones--"a tour de force" (New York Times). Imagine that two doctors in the same city give different diagnoses to identical patients—or that two judges in the same courthouse give markedly different sentences to people who have committed the same crime. Suppose that different interviewers at the same firm make different decisions about indistinguishable job applicants—or that when a company is handling customer complaints, the resolution depends on who happens to answer the phone. Now imagine that the same doctor, the same judge, the same interviewer, or the same customer service agent makes different decisions depending on whether it is morning or afternoon, or Monday rather than Wednesday. These are examples of noise: variability in judgments that should be identical. In Noise, Daniel Kahneman, Olivier Sibony, and Cass R. Sunstein show the detrimental effects of noise in many fields, including medicine, law, economic forecasting, forensic science, bail, child protection, strategy, performance reviews, and personnel selection. Wherever there is judgment, there is noise. Yet, most of the time, individuals and organizations alike are unaware of it. They neglect noise. With a few simple remedies, people can reduce both noise and bias, and so make far better decisions. Packed with original ideas, and offering the same kinds of research-based insights that made Thinking, Fast and Slow and Nudge groundbreaking New York Times bestsellers, Noise explains how and why humans are so susceptible to noise in judgment—and what we can do about it.

The paperback printing of Thinking Statistically includes all the material from the Kindle original plus innovative new segments giving graphical representations of statistics concepts. Thinking Statistically is the book that shows you how to think like a statistician, without worrying about formal statistical techniques. Along the way we learn how selection bias can explain why your boss doesn't know he sucks (even when everyone else does); how to use Bayes' Theorem to decide if your partner is cheating on you; and why Mark Zuckerberg should never be used as an example for anything. See the world in a whole new light, and make better decisions and judgements without ever going near a t-test. Think. Think Statistically.

Data on water quality and other environmental issues are being collected at an ever-increasing rate. In the past, however, the techniques used by scientists to interpret this data have not progressed as quickly. This is a book of modern statistical methods for analysis of practical problems in water quality and water resources. The last fifteen years have seen major advances in the fields of exploratory data analysis (EDA) and robust statistical methods. The 'real-life' characteristics of environmental data tend to drive analysis towards the use of these methods. These advances are presented in a practical and relevant format. Alternate methods are compared, highlighting the strengths and weaknesses of each as applied to environmental data. Techniques for trend analysis and dealing with water below the detection limit are topics covered, which are of great interest to consultants in water-quality and hydrology, scientists in state, provincial and federal water resources, and geological survey agencies. The practising water resources scientist will find the worked examples using actual field data from case studies of environmental problems, of real value. Exercises at the end of each chapter enable the mechanics of the methodological process to be fully understood, with data sets included on diskette for easy use. The result is a book that is both up-to-date and immediately relevant to ongoing work in the environmental and water sciences.

Statistical Thinking for Non-Statisticians in Drug Regulation, Second Edition, is a need-to-know guide to understanding statistical methodology, statistical data and results within drug development and clinical trials. It provides non-statisticians working in the pharmaceutical and medical device industries with an accessible introduction to the knowledge they need when working with statistical information and communicating with statisticians. It covers the statistical aspects of design, conduct, analysis and presentation of data from clinical trials in drug regulation and improves the ability to read, understand and critically appraise statistical methodology in papers and reports. As such, it is directly concerned with the day-to-day practice and the regulatory requirements of drug development and clinical trials. Fully conversant with current regulatory requirements, this second edition includes five new chapters covering Bayesian statistics, adaptive designs, observational studies, methods for safety analysis and monitoring and statistics for diagnosis. Authored by a respected lecturer and consultant to the pharmaceutical industry, Statistical Thinking for Non-Statisticians in Drug Regulation is an ideal guide for physicians, clinical research scientists, managers and associates, data managers, medical writers, regulatory personnel and for all non-statisticians working and learning within the pharmaceutical industry. If you know how to program, you have the skills to turn data into knowledge, using tools of probability and statistics. This concise introduction shows you how to perform statistical analysis computationally, rather than mathematically, with programs written in Python. By working with a single case study throughout this thoroughly revised book, you'll learn the entire process of exploratory data analysis—from collecting data and generating statistics to identifying patterns and testing hypotheses. You'll explore distributions, rules of probability, visualization, and many other tools and concepts. New chapters on regression, time series analysis, survival analysis, and analytic methods will enrich your discoveries. Develop an understanding of probability and statistics by writing and testing code Run experiments to test statistical behavior, such as generating samples from several distributions Use simulations to understand concepts that are hard to grasp mathematically Import data from most sources with Python, rather than rely on data that's cleaned and formatted for statistics tools Use statistical inference to answer questions about real-world data

'A statistical national treasure' Jeremy Vine, BBC Radio 2 'Required reading for all politicians, journalists, medics and anyone who tries to influence people (or is influenced) by statistics. A tour de force' Popular Science Do busier hospitals have higher survival rates? How many trees are there on the planet? Why do old men have big ears? David Spiegelhalter reveals the answers to these and many other questions - questions that can only be addressed using statistical science. Statistics has played a leading role in our scientific understanding of the world for centuries, yet we are all familiar with the way

statistical claims can be sensationalised, particularly in the media. In the age of big data, as data science becomes established as a discipline, a basic grasp of statistical literacy is more important than ever. In *The Art of Statistics*, David Spiegelhalter guides the reader through the essential principles we need in order to derive knowledge from data. Drawing on real world problems to introduce conceptual issues, he shows us how statistics can help us determine the luckiest passenger on the Titanic, whether serial killer Harold Shipman could have been caught earlier, and if screening for ovarian cancer is beneficial. 'Shines a light on how we can use the ever-growing deluge of data to improve our understanding of the world' *Nature*

Nontechnical survey helps to improve the ability to judge the quality of statistical evidence and to make better-informed decisions. Discusses common statistical pitfalls: unrealistic estimates, improper comparisons, premature conclusions, and faulty thinking about probability. Playful in tone, accurate in nature; valuable in and out of the classroom. 1974 edition.

*Thinking Statistically* is the "sharp little book" that shows you how to think like a statistician, without worrying about formal statistical techniques. Along the way we learn how selection bias can explain why your boss doesn't know he sucks (even when everyone else does); how to use Bayes' Theorem to decide if your partner is cheating on you; and why Mark Zuckerberg should never be used as an example for anything. See the world in a whole new light, and make better decisions and judgements without ever going near a t-test. Think. Think Statistically.

If you're a sentient human these days, you've heard people talking of the phenomenal riches promised by the power of big data. Over the past decade or so, the world around us has undergone a staggering transformation, and great things have been promised to anyone able to ride the AI wave. But how exactly do you catch that wave? What does all this mean for you, whether you're an investor choosing among thousands of possible investments, a manager deciding where to allocate your capital, or a student wondering how to ensure there's good work out there for you by the time you graduate? *The Business of Big Data* will show you how to think strategically about the economic impacts of AI, how to complement AI instead of competing against it, how to reap the rewards of the AI revolution, and how to find your place in our brave new data-driven world. Along the way you'll find out how AI is like (and unlike) an ox, why your bank cares how fast you fill in a form, why your car insurer judges you by your email address, and why everything you do is data - from what time you first check your phone in the morning to where you sleep at night.

During the past decade there has been an explosion in computation and information technology. With it have come vast amounts of data in a variety of fields such as medicine, biology, finance, and marketing. The challenge of understanding these data has led to the development of new tools in the field of statistics, and spawned new areas such as data mining, machine learning, and bioinformatics. Many of these tools have common underpinnings but are often expressed with different terminology. This book describes the important ideas in these areas in a common conceptual framework. While the approach is statistical, the emphasis is on concepts rather than mathematics. Many examples are given, with a liberal use of color graphics. It should be a valuable resource for statisticians and anyone interested in data mining in science or industry. The book's coverage is broad, from supervised learning (prediction) to unsupervised learning. The many topics include neural networks, support vector machines, classification trees and boosting---the first comprehensive treatment of this topic in any book. This major new edition features many topics not covered in the original, including graphical models, random forests, ensemble methods, least angle regression & path algorithms for the lasso, non-negative matrix factorization, and spectral clustering. There is also a chapter on methods for "wide" data (p bigger than n), including multiple testing and false discovery rates. Trevor Hastie, Robert Tibshirani, and Jerome Friedman are professors of statistics at Stanford University. They are prominent researchers in this area: Hastie and Tibshirani developed generalized additive models and wrote a popular book of that title. Hastie co-developed much of the statistical modeling software and environment in R/S-PLUS and invented principal curves and surfaces. Tibshirani proposed the lasso and is co-author of the very successful *An Introduction to the Bootstrap*. Friedman is the co-inventor of many data-mining tools including CART, MARS, projection pursuit and gradient boosting.

In this illuminating volume, Robert P. Abelson delves into the too-often dismissed problems of interpreting quantitative data and then presenting them in the context of a coherent story about one's research. Unlike too many books on statistics, this is a remarkably engaging read, filled with fascinating real-life (and real-research) examples rather than with recipes for analysis. It will be of true interest and lasting value to beginning graduate students and seasoned researchers alike. The focus of the book is that the purpose of statistics is to organize a useful argument from quantitative evidence, using a form of principled rhetoric. Five criteria, described by the acronym MAGIC (magnitude, articulation, generality, interestingness, and credibility) are proposed as crucial features of a persuasive, principled argument. Particular statistical methods are discussed, with minimum use of formulas and heavy data sets. The ideas throughout the book revolve around elementary probability theory, t tests, and simple issues of research design. It is therefore assumed that the reader has already had some access to elementary statistics. Many examples are included to explain the connection of statistics to substantive claims about real phenomena.

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