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Chapter 7. Case Study : Comparing Twitter Archives; Getting the Data and Distribution of Tweets; Word Frequencies; Comparing Word Usage; Changes in Word Use; Favorites and Retweets; Summary; Chapter 8. Case Study : Mining NASA Metadata; How Data Is Organized at NASA; Wrangling and Tidying the Data; Some Initial Simple Exploration; Word Co-ocurrences and Correlations; Networks of Description and Title Words; Networks of Keywords; Calculating tf-idf for the Description Fields; What Is tf-idf for the Description Field Words?; Connecting Description Fields to Keywords; Topic Modeling. Mine the rich data tucked away in popular social websites such as Twitter, Facebook, LinkedIn, and Instagram. With the third edition of this popular guide, data scientists, analysts, and programmers will learn how to glean insights from social media—including who's connecting with whom, what they're talking about, and where they're located—using Python code examples, Jupyter notebooks, or Docker containers. In part one, each standalone chapter focuses on one aspect of the social landscape, including each of the major social sites, as well as web pages, blogs and feeds, mailboxes, GitHub, and a newly added chapter covering Instagram. Part two provides a cookbook with two dozen bite-size recipes for solving particular issues with Twitter. Get a straightforward synopsis of the social web landscape Use Docker to easily run each chapter's example code, packaged as a Jupyter notebook Adapt and contribute to the code's open source GitHub repository Learn how to employ best-in-class Python 3 tools to slice and dice the data you collect Apply advanced mining techniques such as TFIDF, cosine similarity, collocation analysis, clique detection, and image recognition Build beautiful data visualizations with Python and JavaScript toolkits Using data from one season of NBA games, Basketball Data Science: With Applications in R is the perfect book for anyone interested in learning and applying data analytics in basketball. Whether assessing the spatial performance of an MBA player's shots or doing an analysis of the impact of high pressure game situations on the probability of scoring, this book discusses a variety of case studies and hands-on examples using a custom R package. The codes are supplied so readers can reproduce the analyses themselves or create their own. Assuming a basic statistical knowledge, Basketball Data Science with R is suitable for students, technicians, coaches, data analysts and applied researchers. Features: · One of the first books to provide statistical and data mining methods for the growing field of analytics in basketball. · Presents tools for modelling graphs and figures to visualize the data. · Includes real world case studies and examples, such as estimations of scoring probability using the Golden State Warriors as a test case. · Provides the source code and data so readers can do their own analyses on NBA teams and players. Summary Beyond Spreadsheets with R shows you how to take raw data and transform it for use in computations, tables, graphs, and more. You'll build on simple programming techniques like loops and conditionals to create your own custom functions. You'll come away with a toolkit of strategies for analyzing and visualizing data of all sorts using R and RStudio. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Spreadsheets are powerful tools for many tasks, but if you need to interpret, interrogate, and present data, they can feel like the wrong tools for the task. That's when R programming is the way to go. The R programming language provides a comfortable environment to properly handle all types of data. And within the open source RStudio development suite, you have at your fingertips easy-to-use ways to simplify complex manipulations and create reproducible processes for analysis and reporting. About the Book With Beyond Spreadsheets with R you'll learn how to go from raw data to meaningful insights using R and RStudio. Each carefully crafted chapter covers a unique way to wrangle data, from understanding individual values to interacting with complex collections of data, including data you scrape from the web. You'll build on simple programming techniques like loops and conditionals to create your own custom functions. You'll come away with a toolkit of strategies for analyzing and visualizing data of all sorts. What's inside How to start programming with R and RStudio Understanding and implementing important R structures and operators Installing and working with R packages Tidying, refining, and plotting your data About the Reader If you're comfortable writing formulas in Excel, you're ready for this book. About the Author Dr Jonathan Carroll is a data science consultant providing R programming services. He holds a PhD in theoretical physics. Table of Contents Introducing data and the R language Getting to know R data types Making new data values Understanding the tools you'll use: Functions Combining data values Selecting data values Doing things with lots of data Doing things conditionally: Control structures Visualizing data: Plotting Doing more with your data with extensions How do you take your data analysis skills beyond Excel to the next level? By learning just enough Python to get stuff done. This hands-on guide shows non-programmers like you how to process information that's initially too messy or difficult to access. You don't need to know a thing about the Python programming language to get started. Through various step-by-step exercises, you'll learn how to acquire, clean, analyze, and present data efficiently. You'll also discover how to automate your data process, schedule file- editing and clean-up tasks, process larger datasets, and create compelling stories with data you obtain. Quickly learn basic Python syntax, data types, and language concepts Work with both machine-readable and human-consumable data Scrape websites and APIs to find a bounty of useful information Clean and format data to eliminate duplicates and errors in your datasets Learn when to standardize data

and when to test and script data cleanup Explore and analyze your datasets with new Python libraries and techniques Use Python solutions to automate your entire data-wrangling process Learn to effectively manage data and execute data science projects from start to finish using Python Key FeaturesUnderstand and utilize data science tools in Python, such as specialized machine learning algorithms and statistical modelingBuild a strong data science foundation with the best data science tools available in PythonAdd value to yourself, your organization, and society by extracting actionable insights from raw dataBook Description Practical Data Science with Python teaches you core data science concepts, with real-world and realistic examples, and strengthens your grip on the basic as well as advanced principles of data preparation and storage, statistics, probability theory, machine learning, and Python programming, helping you build a solid foundation to gain proficiency in data science. The book starts with an overview of basic Python skills and then introduces foundational data science techniques, followed by a thorough explanation of the Python code needed to execute the techniques. You'll understand the code by working through the examples. The code has been broken down into small chunks (a few lines or a function at a time) to enable thorough discussion. As you progress, you will learn how to perform data analysis while exploring the functionalities of key data science Python packages, including pandas, SciPy, and scikit-learn. Finally, the book covers ethics and privacy concerns in data science and suggests resources for improving data science skills, as well as ways to stay up to date on new data science developments. By the end of the book, you should be able to comfortably use Python for basic data science projects and should have the skills to execute the data science process on any data source. What you will learnUse Python data science packages effectivelyClean and prepare data for data science work, including feature engineering and feature selectionData modeling, including classic statistical models (such as t-tests), and essential machine learning algorithms, such as random forests and boosted modelsEvaluate model performanceCompare and understand different machine learning methodsInteract with Excel spreadsheets through PythonCreate automated data science reports through PythonGet to grips with text analytics techniquesWho this book is for The book is intended for beginners, including students starting or about to start a data science, analytics, or related program (e.g. Bachelor’s, Master’s, bootcamp, online courses), recent college graduates who want to learn new skills to set them apart in the job market, professionals who want to learn hands-on data science techniques in Python, and those who want to shift their career to data science. The book requires basic familiarity with Python. A "getting started with Python" section has been included to get complete novices up to speed. Python is one of the top 3 tools that Data Scientists use. One of the tools in their arsenal is the Pandas library. This tool is popular because it gives you so much functionality out of the box. In addition, you can use all the power of Python to make the hard stuff easy! Learning the Pandas Library is designed to bring developers and aspiring data scientists who are anxious to learn Pandas up to speed quickly. It starts with the fundamentals of the data structures. Then, it covers the essential functionality. It includes many examples, graphics, code samples, and plots from real world examples. The Content Covers: Installation Data Structures Series CRUD Series Indexing Series Methods Series Plotting Series Examples DataFrame Methods DataFrame Statistics Grouping, Pivoting, and Reshaping Dealing with Missing Data Joining DataFrames DataFrame Examples Preliminary Reviews This is an excellent introduction benefitting from clear writing and simple examples. The pandas documentation itself is large and sometimes assumes too much knowledge, in my opinion. Learning the Pandas Library bridges this gap for new users and even for those with some pandas experience such as me. -Garry C. I have finished reading Learning the Pandas Library and I liked it... very useful and helpful tips even for people who use pandas regularly. -Tom Z. Data science teams looking to turn research into useful analytics applications require not only the right tools, but also the right approach if they’re to succeed. With the revised second edition of this hands-on guide, up-and-coming data scientists will learn how to use the Agile Data Science development methodology to build data applications with Python, Apache Spark, Kafka, and other tools. Author Russell Jurney demonstrates how to compose a data platform for building, deploying, and refining analytics applications with Apache Kafka, MongoDB, ElasticSearch, d3.js, scikit-learn, and Apache Airflow. You’ll learn an iterative approach that lets you quickly change the kind of analysis you’re doing, depending on what the data is telling you. Publish data science work as a web application, and affect meaningful change in your organization. Build value from your data in a series of agile sprints, using the data-value pyramid Extract features for statistical models from a single dataset Visualize data with charts, and expose different aspects through interactive reports Use historical data to predict the future via classification and regression Translate predictions into actions Get feedback from users after each sprint to keep your project on track TypeScript is a typed superset of JavaScript with the potential to solve many of the headaches for which JavaScript is famous. But TypeScript has a learning curve of its own, and understanding how to use it effectively can take time. This book guides you through 62 specific ways to improve your use of TypeScript. Author Dan Vanderkam, a principal software engineer at Sidewalk Labs, shows you how to apply these ideas, following the format popularized by Effective C++ and Effective Java (both from Addison-Wesley). You’ll advance from a beginning or intermediate user familiar with the basics to an advanced user who knows how to use the language well. Effective TypeScript is divided into eight chapters: Getting to Know TypeScript TypeScript’s Type System Type Inference Type Design Working with any

Types Declarations and @types Writing and Running Your Code Migrating to TypeScript If you’re like most R users, you have deep knowledge and love for statistics. But as your organization continues to collect huge amounts of data, adding tools such as Apache Spark makes a lot of sense. With this practical book, data scientists and professionals working with large-scale data applications will learn how to use Spark from R to tackle big data and big compute problems. Authors Javier Luraschi, Kevin Kuo, and Edgar Ruiz show you how to use R with Spark to solve different data analysis problems. This book covers relevant data science topics, cluster computing, and issues that should interest even the most advanced users. Analyze, explore, transform, and visualize data in Apache Spark with R Create statistical models to extract information and predict outcomes; automate the process in production-ready workflows Perform analysis and modeling across many machines using distributed computing techniques Use large-scale data from multiple sources and different formats with ease from within Spark Learn about alternative modeling frameworks for graph processing, geospatial analysis, and genomics at scale Dive into advanced topics including custom transformations, real-time data processing, and creating custom Spark extensions Natural Language Processing (NLP) provides boundless opportunities for solving problems in artificial intelligence, making products such as Amazon Alexa and Google Translate possible. If you’re a developer or data scientist new to NLP and deep learning, this practical guide shows you how to apply these methods using PyTorch, a Python-based deep learning library. Authors Delip Rao and Brian McMahon provide you with a solid grounding in NLP and deep learning algorithms and demonstrate how to use PyTorch to build applications involving rich representations of text specific to the problems you face. Each chapter includes several code examples and illustrations. Explore computational graphs and the supervised learning paradigm Master the basics of the PyTorch optimized tensor manipulation library Get an overview of traditional NLP concepts and methods Learn the basic ideas involved in building neural networks Use embeddings to represent words, sentences, documents, and other features Explore sequence prediction and generate sequence-to-sequence models Learn design patterns for building production NLP systems Design, implement, and deliver successful streaming applications, machine learning pipelines and graph applications using Spark SQL API About This Book Learn about the design and implementation of streaming applications, machine learning pipelines, deep learning, and large-scale graph processing applications using Spark SQL APIs and Scala. Learn data exploration, data munging, and how to process structured and semi-structured data using real-world datasets and gain hands-on exposure to the issues and challenges of working with noisy and "dirty" real-world data. Understand design considerations for scalability and performance in web-scale Spark application architectures. Who This Book Is For If you are a developer, engineer, or an architect and want to learn how to use Apache Spark in a web-scale project, then this is the book for you. It is assumed that you have prior knowledge of SQL querying. A basic programming knowledge with Scala, Java, R, or Python is all you need to get started with this book. What You Will Learn Familiarize yourself with Spark SQL programming, including working with DataFrame/Dataset API and SQL Perform a series of hands-on exercises with different types of data sources, including CSV, JSON, Avro, MySQL, and MongoDB Perform data quality checks, data visualization, and basic statistical analysis tasks Perform data munging tasks on publically available datasets Learn how to use Spark SQL and Apache Kafka to build streaming applications Learn key performance-tuning tips and tricks in Spark SQL applications Learn key architectural components and patterns in large-scale Spark SQL applications In Detail In the past year, Apache Spark has been increasingly adopted for the development of distributed applications. Spark SQL APIs provide an optimized interface that helps developers build such applications quickly and easily. However, designing web-scale production applications using Spark SQL APIs can be a complex task. Hence, understanding the design and implementation best practices before you start your project will help you avoid these problems. This book gives an insight into the engineering practices used to design and build real-world, Spark-based applications. The book's hands-on examples will give you the required confidence to work on any future projects you encounter in Spark SQL. It starts by familiarizing you with data exploration and data munging tasks using Spark SQL and Scala. Extensive code examples will help you understand the methods used to implement typical use-cases for various types of applications. You will get a walkthrough of the key concepts and terms that are common to streaming, machine learning, and graph applications. You will also learn key performance-tuning details including Cost Based Optimization (Spark 2.2) in Spark SQL applications. Finally, you will move on to learning how such systems are architected and deployed for a successful delivery of your project. Style and approach This book is a hands-on guide to designing, building, and deploying Spark SQL-centric production applications at scale. Get to grips with pandas—a versatile and high-performance Python library for data manipulation, analysis, and discovery Key FeaturesPerform efficient data analysis and manipulation tasks using pandasApply pandas to different real-world domains using step-by-step demonstrationsGet accustomed to using pandas as an effective data exploration toolBook Description Data analysis has become a necessary skill in a variety of positions where knowing how to work with data and extract insights can generate significant value. Hands-On Data Analysis with Pandas will show you how to analyze your data, get started with machine learning, and work effectively with Python libraries often used for data science, such as pandas, NumPy, matplotlib, seaborn, and scikit-learn. Using real-world datasets, you

will learn how to use the powerful pandas library to perform data wrangling to reshape, clean, and aggregate your data. Then, you will learn how to conduct exploratory data analysis by calculating summary statistics and visualizing the data to find patterns. In the concluding chapters, you will explore some applications of anomaly detection, regression, clustering, and classification, using scikit-learn, to make predictions based on past data. By the end of this book, you will be equipped with the skills you need to use pandas to ensure the veracity of your data, visualize it for effective decision-making, and reliably reproduce analyses across multiple datasets. What you will learnUnderstand how data analysts and scientists gather and analyze dataPerform data analysis and data wrangling in PythonCombine, group, and aggregate data from multiple sourcesCreate data visualizations with pandas, matplotlib, and seabornApply machine learning (ML) algorithms to identify patterns and make predictionsUse Python data science libraries to analyze real-world datasetsUse pandas to solve common data representation and analysis problemsBuild Python scripts, modules, and packages for reusable analysis codeWho this book is for This book is for data analysts, data science beginners, and Python developers who want to explore each stage of data analysis and scientific computing using a wide range of datasets. You will also find this book useful if you are a data scientist who is looking to implement pandas in machine learning. Working knowledge of Python programming language will be beneficial. More physicists today are taking on the role of software developer as part of their research, but software development isn't always easy or obvious, even for physicists. This practical book teaches essential software development skills to help you automate and accomplish nearly any aspect of research in a physics-based field. Written by two PhDs in nuclear engineering, this book includes practical examples drawn from a working knowledge of physics concepts. You'll learn how to use the Python programming language to perform everything from collecting and analyzing data to building software and publishing your results. In four parts, this book includes: Getting Started: Jump into Python, the command line, data containers, functions, flow control and logic, and classes and objects Getting It Done: Learn about regular expressions, analysis and visualization, NumPy, storing data in files and HDF5, important data structures in physics, computing in parallel, and deploying software Getting It Right: Build pipelines and software, learn to use local and remote version control, and debug and test your code Getting It Out There: Document your code, process and publish your findings, and collaborate efficiently; dive into software licenses, ownership, and copyright procedures Python for Data Analysis is concerned with the nuts and bolts of manipulating, processing, cleaning, and crunching data in Python. It is also a practical, modern introduction to scientific computing in Python, tailored for data-intensive applications. This is a book about the parts of the Python language and libraries you'll need to effectively solve a broad set of data analysis problems. This book is not an exposition on analytical methods using Python as the implementation language. Written by Wes McKinney, the main author of the pandas library, this hands-on book is packed with practical cases studies. It's ideal for analysts new to Python and for Python programmers new to scientific computing. Use the IPython interactive shell as your primary development environment Learn basic and advanced NumPy (Numerical Python) features Get started with data analysis tools in the pandas library Use high-performance tools to load, clean, transform, merge, and reshape data Create scatter plots and static or interactive visualizations with matplotlib Apply the pandas groupby facility to slice, dice, and summarize datasets Measure data by points in time, whether it's specific instances, fixed periods, or intervals Learn how to solve problems in web analytics, social sciences, finance, and economics, through detailed examples Deep learning is often viewed as the exclusive domain of math PhDs and big tech companies. But as this hands-on guide demonstrates, programmers comfortable with Python can achieve impressive results in deep learning with little math background, small amounts of data, and minimal code. How? With fastai, the first library to provide a consistent interface to the most frequently used deep learning applications. Authors Jeremy Howard and Sylvain Gugger, the creators of fastai, show you how to train a model on a wide range of tasks using fastai and PyTorch. You'll also dive progressively further into deep learning theory to gain a complete understanding of the algorithms behind the scenes. Train models in computer vision, natural language processing, tabular data, and collaborative filtering Learn the latest deep learning techniques that matter most in practice Improve accuracy, speed, and reliability by understanding how deep learning models work Discover how to turn your models into web applications Implement deep learning algorithms from scratch Consider the ethical implications of your work Gain insight from the foreword by PyTorch cofounder, Soumith Chintala This guide for practicing statisticians, data scientists, and R users and programmers will teach the essentials of preprocessing: data leveraging the R programming language to easily and quickly turn noisy data into usable pieces of information. Data wrangling, which is also commonly referred to as data munging, transformation, manipulation, janitor work, etc., can be a painstakingly laborious process. Roughly 80% of data analysis is spent on cleaning and preparing data; however, being a prerequisite to the rest of the data analysis workflow (visualization, analysis, reporting), it is essential that one become fluent and efficient in data wrangling techniques. This book will guide the user through the data wrangling process via a step-by-step tutorial approach and provide a solid foundation for working with data in R. The author's goal is to teach the user how to easily wrangle data in order to spend more time on understanding the content of the data. By the end of the book, the user will have learned: How to work with different types of data such

as numerics, characters, regular expressions, factors, and dates The difference between different data structures and how to create, add additional components to, and subset each data structure How to acquire and parse data from locations previously inaccessible How to develop functions and use loop control structures to reduce code redundancy How to use pipe operators to simplify code and make it more readable How to reshape the layout of data and manipulate, summarize, and join data sets Master how to use the Julia language to solve business critical data science challenges. After covering the importance of Julia to the data science community and several essential data science principles, we start with the basics including how to install Julia and its powerful libraries. Many examples are provided as we illustrate how to leverage each Julia command, dataset, and function. Specialized script packages are introduced and described. Hands-on problems representative of those commonly encountered throughout the data science pipeline are provided, and we guide you in the use of Julia in solving them using published datasets. Many of these scenarios make use of existing packages and built-in functions, as we cover: 1. 1. An overview of the data science pipeline along with an example illustrating the key points, implemented in Julia 2. 2. Options for Julia IDEs 3. 3. Programming structures and functions 4. 4. Engineering tasks, such as importing, cleaning, formatting and storing data, as well as performing data preprocessing 5. 5. Data visualization and some simple yet powerful statistics for data exploration purposes 6. 6. Dimensionality reduction and feature evaluation 7. 7. Machine learning methods, ranging from unsupervised (different types of clustering) to supervised ones (decision trees, random forests, basic neural networks, regression trees, and Extreme Learning Machines) 8. 8. Graph analysis including pinpointing the connections among the various entities and how they can be mined for useful insights. Each chapter concludes with a series of questions and exercises to reinforce what you learned. The last chapter of the book will guide you in creating a data science application from scratch using Julia. 86 recipes on how to build fast, scalable, and powerful web services and applications with Go Key Features Become proficient in RESTful web services Build scalable, high-performant web applications in Go Get acquainted with Go frameworks for web development Book Description Go is an open source programming language that is designed to scale and support concurrency at the language level. This gives you the liberty to write large concurrent web applications with ease. From creating web application to deploying them on Amazon Cloud Services, this book will be your one-stop guide to learn web development in Go. The Go Web Development Cookbook teaches you how to create REST services, write microservices, and deploy Go Docker containers. Whether you are new to programming or a professional developer, this book will help get you up to speed with web development in Go. We will focus on writing modular code in Go; in-depth informative examples build the base, one step at a time. You will learn how to create a server, work with static files, SQL, NoSQL databases, and Beego. You will also learn how to create and secure REST services, and create and deploy Go web application and Go Docker containers on Amazon Cloud Services. By the end of the book, you will be able to apply the skills you've gained in Go to create and explore web applications in any domain. What you will learn Create a simple HTTP and TCP web server and understand how it works Explore record in a MySQL and MongoDB database Write and consume RESTful web service in Go Invent microservices in Go using Micro – a microservice toolkit Create and Deploy the Beego application with Nginx Deploy Go web application and Docker containers on an AWS EC2 instance Who this book is for This book is for Go developers interested in learning how to use Go to build powerful web applications. A background in web development is expected. Data science libraries, frameworks, modules, and toolkits are great for doing data science, but they’re also a good way to dive into the discipline without actually understanding data science. In this book, you’ll learn how many of the most fundamental data science tools and algorithms work by implementing them from scratch. If you have an aptitude for mathematics and some programming skills, author Joel Grus will help you get comfortable with the math and statistics at the core of data science, and with hacking skills you need to get started as a data scientist. Today’s messy glut of data holds answers to questions no one’s even thought to ask. This book provides you with the know-how to dig those answers out. Get a crash course in Python Learn the basics of linear algebra, statistics, and probability—and understand how and when they're used in data science Collect, explore, clean, munge, and manipulate data Dive into the fundamentals of machine learning Implement models such as k-nearest Neighbors, Naive Bayes, linear and logistic regression, decision trees, neural networks, and clustering Explore recommender systems, natural language processing, network analysis, MapReduce, and databases A comprehensive overview of data science covering the analytics, programming, and business skills necessary to master the discipline Finding a good data scientist has been likened to hunting for a unicorn: the required combination of technical skills is simply very hard to find in one person. In addition, good data science is not just rote application of trainable skill sets; it requires the ability to think flexibly about all these areas and understand the connections between them. This book provides a crash course in data science, combining all the necessary skills into a unified discipline. Unlike many analytics books, computer science and software engineering are given extensive coverage since they play such a central role in the daily work of a data scientist. The author also describes classic machine learning algorithms, from their mathematical foundations to real-world applications. Visualization tools are reviewed, and their central importance in data science is highlighted. Classical statistics is addressed to help readers think critically about the

interpretation of data and its common pitfalls. The clear communication of technical results, which is perhaps the most undertrained of data science skills, is given its own chapter, and all topics are explained in the context of solving real-world data problems. The book also features: • Extensive sample code and tutorials using Python™ along with its technical libraries • Core technologies of “Big Data,” including their strengths and limitations and how they can be used to solve real-world problems • Coverage of the practical realities of the tools, keeping theory to a minimum; however, when theory is presented, it is done in an intuitive way to encourage critical thinking and creativity • A wide variety of case studies from industry • Practical advice on the realities of being a data scientist today, including the overall workflow, where time is spent, the types of datasets worked on, and the skill sets needed The Data Science Handbook is an ideal resource for data analysis methodology and big data software tools. The book is appropriate for people who want to practice data science, but lack the required skill sets. This includes software professionals who need to better understand analytics and statisticians who need to understand software. Modern data science is a unified discipline, and it is presented as such. This book is also an appropriate reference for researchers and entry-level graduate students who need to learn real-world analytics and expand their skill set. FIELD CADY is the data scientist at the Allen Institute for Artificial Intelligence, where he develops tools that use machine learning to mine scientific literature. He has also worked at Google and several Big Data startups. He has a BS in physics and math from Stanford University, and an MS in computer science from Carnegie Mellon. For many researchers, Python is a first-class tool mainly because of its libraries for storing, manipulating, and gaining insight from data. Several resources exist for individual pieces of this data science stack, but only with the Python Data Science Handbook do you get them all—IPython, NumPy, Pandas, Matplotlib, Scikit-Learn, and other related tools. Working scientists and data crunchers familiar with reading and writing Python code will find this comprehensive desk reference ideal for tackling day-to-day issues: manipulating, transforming, and cleaning data; visualizing different types of data; and using data to build statistical or machine learning models. Quite simply, this is the must-have reference for scientific computing in Python. With this handbook, you’ll learn how to use: IPython and Jupyter: provide computational environments for data scientists using Python NumPy: includes the ndarray for efficient storage and manipulation of dense data arrays in Python Pandas: features the DataFrame for efficient storage and manipulation of labeled/columnar data in Python Matplotlib: includes capabilities for a flexible range of data visualizations in Python Scikit-Learn: for efficient and clean Python implementations of the most important and established machine learning algorithms This collection represents the full spectrum of data-related content we’ve published on O’Reilly Radar over the last year. Mike Loukides kicked things off in June 2010 with “What is data science?” and from there we’ve pursued the various threads and themes that naturally emerged. Now, roughly a year later, we can look back over all we’ve covered and identify a number of core data areas: Data issues -- The opportunities and ambiguities of the data space are evident in discussions around privacy, the implications of data-centric industries, and the debate about the phrase “data science” itself. The application of data: products and processes – A “data product” can emerge from virtually any domain, including everything from data startups to established enterprises to media/journalism to education and research. Data science and data tools -- The tools and technologies that drive data science are of course essential to this space, but the varied techniques being applied are also key to understanding the big data arena. The business of data – Take a closer look at the actions connected to data -- the finding, organizing, and analyzing that provide organizations of all sizes with the information they need to compete. Development Research in Practice leads the reader through a complete empirical research project, providing links to continuously updated resources on the DIME Wiki as well as illustrative examples from the Demand for Safe Spaces study. The handbook is intended to train users of development data how to handle data effectively, efficiently, and ethically. “In the DIME Analytics Data Handbook, the DIME team has produced an extraordinary public good: a detailed, comprehensive, yet easy-to-read manual for how to manage a data-oriented research project from beginning to end. It offers everything from big-picture guidance on the determinants of high-quality empirical research, to specific practical guidance on how to implement specific workflows—and includes computer code! I think it will prove durably useful to a broad range of researchers in international development and beyond, and I learned new practices that I plan on adopting in my own research group.†? —Marshall Burke, Associate Professor, Department of Earth System Science, and Deputy Director, Center on Food Security and the Environment, Stanford University “Data are the essential ingredient in any research or evaluation project, yet there has been too little attention to standardized practices to ensure high-quality data collection, handling, documentation, and exchange. Development Research in Practice: The DIME Analytics Data Handbook seeks to fill that gap with practical guidance and tools, grounded in ethics and efficiency, for data management at every stage in a research project. This excellent resource sets a new standard for the field and is an essential reference for all empirical researchers.†? —Ruth E. Levine, PhD, CEO, IDinsight “Development Research in Practice: The DIME Analytics Data Handbook is an important resource and a must-read for all development economists, empirical social scientists, and public policy analysts. Based on decades of pioneering work at the World Bank on data collection, measurement, and analysis, the handbook provides valuable tools to allow research teams to more efficiently and

transparently manage their work flows—yielding more credible analytical conclusions as a result.†? —Edward Miguel, Oxfam Professor in Environmental and Resource Economics and Faculty Director of the Center for Effective Global Action, University of California, Berkeley “The DIME Analytics Data Handbook is a must-read for any data-driven researcher looking to create credible research outcomes and policy advice. By meticulously describing detailed steps, from project planning via ethical and responsible code and data practices to the publication of research papers and associated replication packages, the DIME handbook makes the complexities of transparent and credible research easier.†? —Lars Vilhuber, Data Editor, American Economic Association, and Executive Director, Labor Dynamics Institute, Cornell University Statistics, big data, and machine learning for Clojure programmers About This Book Write code using Clojure to harness the power of your data Discover the libraries and frameworks that will help you succeed A practical guide to understanding how the Clojure programming language can be used to derive insights from data Who This Book Is For This book is aimed at developers who are already productive in Clojure but who are overwhelmed by the breadth and depth of understanding required to be effective in the field of data science. Whether you're tasked with delivering a specific analytics project or simply suspect that you could be deriving more value from your data, this book will inspire you with the opportunities–and inform you of the risks–that exist in data of all shapes and sizes. What You Will Learn Perform hypothesis testing and understand feature selection and statistical significance to interpret your results with confidence Implement the core machine learning techniques of regression, classification, clustering and recommendation Understand the importance of the value of simple statistics and distributions in exploratory data analysis Scale algorithms to web-sized datasets efficiently using distributed programming models on Hadoop and Spark Apply suitable analytic approaches for text, graph, and time series data Interpret the terminology that you will encounter in technical papers Import libraries from other JVM languages such as Java and Scala Communicate your findings clearly and convincingly to nontechnical colleagues In Detail The term “data science” has been widely used to define this new profession that is expected to interpret vast datasets and translate them to improved decision-making and performance. Clojure is a powerful language that combines the interactivity of a scripting language with the speed of a compiled language. Together with its rich ecosystem of native libraries and an extremely simple and consistent functional approach to data manipulation, which maps closely to mathematical formula, it is an ideal, practical, and flexible language to meet a data scientist's diverse needs. Taking you on a journey from simple summary statistics to sophisticated machine learning algorithms, this book shows how the Clojure programming language can be used to derive insights from data. Data scientists often forge a novel path, and you'll see how to make use of Clojure's Java interoperability capabilities to access libraries such as Mahout and Mllib for which Clojure wrappers don't yet exist. Even seasoned Clojure developers will develop a deeper appreciation for their language's flexibility! You'll learn how to apply statistical thinking to your own data and use Clojure to explore, analyze, and visualize it in a technically and statistically robust way. You can also use Incanter for local data processing and ClojureScript to present interactive visualisations and understand how distributed platforms such as Hadoop sand Spark's MapReduce and GraphX's BSP solve the challenges of data analysis at scale, and how to explain algorithms using those programming models. Above all, by following the explanations in this book, you'll learn not just how to be effective using the current state-of-the-art methods in data science, but why such methods work so that you can continue to be productive as the field evolves into the future. Style and approach This is a practical guide to data science that teaches theory by example through the libraries and frameworks accessible from the Clojure programming language. Learn how to use, deploy, and maintain Apache Spark with this comprehensive guide, written by the creators of the open-source cluster-computing framework. With an emphasis on improvements and new features in Spark 2.0, authors Bill Chambers and Matei Zaharia break down Spark topics into distinct sections, each with unique goals. You’ll explore the basic operations and common functions of Spark’s structured APIs, as well as Structured Streaming, a new high-level API for building end-to-end streaming applications. Developers and system administrators will learn the fundamentals of monitoring, tuning, and debugging Spark, and explore machine learning techniques and scenarios for employing MLlib, Spark’s scalable machine-learning library. Get a gentle overview of big data and Spark Learn about DataFrames, SQL, and Datasets—Spark’s core APIs—through worked examples Dive into Spark’s low-level APIs, RDDs, and execution of SQL and DataFrames Understand how Spark runs on a cluster Debug, monitor, and tune Spark clusters and applications Learn the power of Structured Streaming, Spark’s stream-processing engine Learn how you can apply MLlib to a variety of problems, including classification or recommendation The Practice of Reproducible Research presents concrete examples of how researchers in the data-intensive sciences are working to improve the reproducibility of their research projects. In each of the thirty-one case studies in this volume, the author or team describes the workflow that they used to complete a real-world research project. Authors highlight how they utilized particular tools, ideas, and practices to support reproducibility, emphasizing the very practical how, rather than the why or what, of conducting reproducible research. Part 1 provides an accessible introduction to reproducible research, a basic reproducible research project template, and a synthesis of lessons learned from across the thirty-one case studies. Parts 2 and 3 focus on the case studies

themselves. The Practice of Reproducible Research is an invaluable resource for students and researchers who wish to better understand the practice of data-intensive sciences and learn how to make their own research more reproducible. Explore the world of data science from scratch with Julia by your side About This Book An in-depth exploration of Julia's growing ecosystem of packages Work with the most powerful open-source libraries for deep learning, data wrangling, and data visualization Learn about deep learning using Mocha.jl and give speed and high performance to data analysis on large data sets Who This Book Is For This book is aimed at data analysts and aspiring data scientists who have a basic knowledge of Julia or are completely new to it. The book also appeals to those competent in R and Python and wish to adopt Julia to improve their skills set in Data Science. It would be beneficial if the readers have a good background in statistics and computational mathematics. What You Will Learn Apply statistical models in Julia for data-driven decisions Understanding the process of data munging and data preparation using Julia Explore techniques to visualize data using Julia and D3 based packages Using Julia to create self-learning systems using cutting edge machine learning algorithms Create supervised and unsupervised machine learning systems using Julia. Also, explore ensemble models Build a recommendation engine in Julia Dive into Julia's deep learning framework and build a system using Mocha.jl In Detail Julia is a fast and high performing language that's perfectly suited to data science with a mature package ecosystem and is now feature complete. It is a good tool for a data science practitioner. There was a famous post at Harvard Business Review that Data Scientist is the sexiest job of the 21st century. (https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century). This book will help you get familiarised with Julia's rich ecosystem, which is continuously evolving, allowing you to stay on top of your game. This book contains the essentials of data science and gives a high-level overview of advanced statistics and techniques. You will dive in and will work on generating insights by performing inferential statistics, and will reveal hidden patterns and trends using data mining. This has the practical coverage of statistics and machine learning. You will develop knowledge to build statistical models and machine learning systems in Julia with attractive visualizations. You will then delve into the world of Deep learning in Julia and will understand the framework, Mocha.jl with which you can create artificial neural networks and implement deep learning. This book addresses the challenges of real-world data science problems, including data cleaning, data preparation, inferential statistics, statistical modeling, building high-performance machine learning systems and creating effective visualizations using Julia. Style and approach This practical and easy-to-follow yet comprehensive guide will get you learning about Julia with respect to data science. Each topic is explained thoroughly and placed in context. For the more inquisitive, we dive deeper into the language and its use case. This is the one true guide to working with Julia in data science. Marine Ecotoxicology: Current Knowledge and Future Issues is the first unified resource to cover issues related to contamination, responses, and testing techniques of saltwater from a toxicological perspective. With its unprecedented focus on marine environments and logical chapter progression, this book is useful to graduate students, ecotoxicologists, risk assessors, and regulators involved or interested in marine waters. As human interaction with these environments increases, understanding of the pollutants and toxins introduced into the oceans becomes ever more critical, and this book builds a foundation of knowledge to assist scientists in studying, monitoring, and making decisions that affect both marine environments and human health. A team of world renowned experts provide detailed analyses of the most common contaminants in marine environments and explain the design and purpose of toxicity testing methods, while exploring the future of ecotoxicology studies in relation to the world’s oceans. As the threat of increasing pollution in marine environments becomes an ever more tangible reality, Marine Ecotoxicology offers insights and guidance to mitigate that threat. Provides practical tools and methods for assessing and monitoring the accumulation and effects of contaminants in marine environments Unites world renowned experts in marine ecotoxicology to deliver thorough and diverse perspectives Builds the foundation required for risk assessors and regulators to adequately assess and monitor the impact of pollution in marine environments Offers helpful insights and guidance to graduate students, ecotoxicologists, risk assessors, and regulators interested in mitigating threats to marine waters Create data mining algorithms About This Book Develop a strong strategy to solve predictive modeling problems using the most popular data mining algorithms Real-world case studies will take you from novice to intermediate to apply data mining techniques Deploy cutting-edge sentiment analysis techniques to real-world social media data using R Who This Book Is For This Learning Path is for R developers who are looking to making a career in data analysis or data mining. Those who come across data mining problems of different complexities from web, text, numerical, political, and social media domains will find all information in this single learning path. What You Will Learn Discover how to manipulate data in R Get to know top classification algorithms written in R Explore solutions written in R based on R Hadoop projects Apply data management skills in handling large data sets Acquire knowledge about neural network concepts and their applications in data mining Create predictive models for classification, prediction, and recommendation Use various libraries on R CRAN for data mining Discover more about data potential, the pitfalls, and inferencial gotchas Gain an insight into the concepts of supervised and unsupervised learning Delve into exploratory data analysis Understand the minute details of sentiment analysis In Detail Data mining is the first step to understanding data and making

sense of heaps of data. Properly mined data forms the basis of all data analysis and computing performed on it. This learning path will take you from the very basics of data mining to advanced data mining techniques, and will end up with a specialized branch of data mining—social media mining. You will learn how to manipulate data with R using code snippets and how to mine frequent patterns, association, and correlation while working with R programs. You will discover how to write code for various predication models, stream data, and time-series data. You will also be introduced to solutions written in R based on R Hadoop projects. Now that you are comfortable with data mining with R, you will move on to implementing your knowledge with the help of end-to-end data mining projects. You will learn how to apply different mining concepts to various statistical and data applications in a wide range of fields. At this stage, you will be able to complete complex data mining cases and handle any issues you might encounter during projects. After this, you will gain hands-on experience of generating insights from social media data. You will get detailed instructions on how to obtain, process, and analyze a variety of socially-generated data while providing a theoretical background to accurately interpret your findings. You will be shown R code and examples of data that can be used as a springboard as you get the chance to undertake your own analyses of business, social, or political data. This Learning Path combines some of the best that Packt has to offer in one complete, curated package. It includes content from the following Packt products: Learning Data Mining with R by Bater Makhabel R Data Mining Blueprints by Pradeepta Mishra Social Media Mining with R by Nathan Danneman and Richard Heimann Style and approach A complete package with which will take you from the basics of data mining to advanced data mining techniques, and will end up with a specialized branch of data mining—social media mining. Get complete instructions for manipulating, processing, cleaning, and crunching datasets in Python. Updated for Python 3.6, the second edition of this hands-on guide is packed with practical case studies that show you how to solve a broad set of data analysis problems effectively. You'll learn the latest versions of pandas, NumPy, IPython, and Jupyter in the process. Written by Wes McKinney, the creator of the Python pandas project, this book is a practical, modern introduction to data science tools in Python. It's ideal for analysts new to Python and for Python programmers new to data science and scientific computing. Data files and related material are available on GitHub. Use the IPython shell and Jupyter notebook for exploratory computing Learn basic and advanced features in NumPy (Numerical Python) Get started with data analysis tools in the pandas library Use flexible tools to load, clean, transform, merge, and reshape data Create informative visualizations with matplotlib Apply the pandas groupby facility to slice, dice, and summarize datasets Analyze and manipulate regular and irregular time series data Learn how to solve real-world data analysis problems with thorough, detailed examples With detailed notes, tables, and examples, this handy reference will help you navigate the basics of structured machine learning. Author Matt Harrison delivers a valuable guide that you can use for additional support during training and as a convenient resource when you dive into your next machine learning project. Ideal for programmers, data scientists, and AI engineers, this book includes an overview of the machine learning process and walks you through classification with structured data. You'll also learn methods for clustering, predicting a continuous value (regression), and reducing dimensionality, among other topics. This pocket reference includes sections that cover: Classification, using the Titanic dataset Cleaning data and dealing with missing data Exploratory data analysis Common preprocessing steps using sample data Selecting features useful to the model Model selection Metrics and classification evaluation Regression examples using k-nearest neighbor, decision trees, boosting, and more Metrics for regression evaluation Clustering Dimensionality reduction Scikit-learn pipelines Summary Deep Learning with Python introduces the field of deep learning using the Python language and the powerful Keras library. Written by Keras creator and Google AI researcher François Chollet, this book builds your understanding through intuitive explanations and practical examples. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Machine learning has made remarkable progress in recent years. We went from near-unusable speech and image recognition, to near-human accuracy. We went from machines that couldn't beat a serious Go player, to defeating a world champion. Behind this progress is deep learning—a combination of engineering advances, best practices, and theory that enables a wealth of previously impossible smart applications. About the Book Deep Learning with Python introduces the field of deep learning using the Python language and the powerful Keras library. Written by Keras creator and Google AI researcher François Chollet, this book builds your understanding through intuitive explanations and practical examples. You'll explore challenging concepts and practice with applications in computer vision, natural-language processing, and generative models. By the time you finish, you'll have the knowledge and hands-on skills to apply deep learning in your own projects. What's Inside Deep learning from first principles Setting up your own deep-learning environment Image-classification models Deep learning for text and sequences Neural style transfer, text generation, and image generation About the Reader Readers need intermediate Python skills. No previous experience with Keras, TensorFlow, or machine learning is required. About the Author François Chollet works on deep learning at Google in Mountain View, CA. He is the creator of the Keras deep-learning library, as well as a contributor to the TensorFlow machine-learning framework. He also does deep-learning research, with a focus on computer vision and the application of machine learning to

formal reasoning. His papers have been published at major conferences in the field, including the Conference on Computer Vision and Pattern Recognition (CVPR), the Conference and Workshop on Neural Information Processing Systems (NIPS), the International Conference on Learning Representations (ICLR), and others. Table of Contents PART 1 - FUNDAMENTALS OF DEEP LEARNING What is deep learning? Before we begin: the mathematical building blocks of neural networks Getting started with neural networks Fundamentals of machine learning PART 2 - DEEP LEARNING IN PRACTICE Deep learning for computer vision Deep learning for text and sequences Advanced deep-learning best practices Generative deep learning Conclusions appendix A - Installing Keras and its dependencies on Ubuntu appendix B - Running Jupyter notebooks on an EC2 GPU instance Statistical Computation for Programmers, Scientists, Quants, Excel Users, and Other Professionals Using the open source R language, you can build powerful statistical models to answer many of your most challenging questions. R has traditionally been difficult for non-statisticians to learn, and most R books assume far too much knowledge to be of help. R for Everyone, Second Edition, is the solution. Drawing on his unsurpassed experience teaching new users, professional data scientist Jared P. Lander has written the perfect tutorial for anyone new to statistical programming and modeling. Organized to make learning easy and intuitive, this guide focuses on the 20 percent of R functionality you'll need to accomplish 80 percent of modern data tasks. Lander's self-contained chapters start with the absolute basics, offering extensive hands-on practice and sample code. You'll download and install R; navigate and use the R environment; master basic program control, data import, manipulation, and visualization; and walk through several essential tests. Then, building on this foundation, you'll construct several complete models, both linear and nonlinear, and use some data mining techniques. After all this you'll make your code reproducible with LaTeX, RMarkdown, and Shiny. By the time you're done, you won't just know how to write R programs, you'll be ready to tackle the statistical problems you care about most. Coverage includes Explore R, RStudio, and R packages Use R for math: variable types, vectors, calling functions, and more Exploit data structures, including data.frames, matrices, and lists Read many different types of data Create attractive, intuitive statistical graphics Write user-defined functions Control program flow with if, ifelse, and complex checks Improve program efficiency with group manipulations Combine and reshape multiple datasets Manipulate strings using R's facilities and regular expressions Create normal, binomial, and Poisson probability distributions Build linear, generalized linear, and nonlinear models Program basic statistics: mean, standard deviation, and t-tests Train machine learning models Assess the quality of models and variable selection Prevent overfitting and perform variable selection, using the Elastic Net and Bayesian methods Analyze univariate and multivariate time series data Group data via K-means and hierarchical clustering Prepare reports, slideshows, and web pages with knitr Display interactive data with RMarkdown and htmlwidgets Implement dashboards with Shiny Build reusable R packages with devtools and Rcpp Register your product at informit.com/register for convenient access to downloads, updates, and corrections as they become available. Summary Data Wrangling with JavaScript is hands-on guide that will teach you how to create a JavaScript-based data processing pipeline, handle common and exotic data, and master practical troubleshooting strategies. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Why not handle your data analysis in JavaScript? Modern libraries and data handling techniques mean you can collect, clean, process, store, visualize, and present web application data while enjoying the efficiency of a single-language pipeline and data-centric web applications that stay in JavaScript end to end. About the Book Data Wrangling with JavaScript promotes JavaScript to the center of the data analysis stage! With this hands-on guide, you'll create a JavaScript-based data processing pipeline, handle common and exotic data, and master practical troubleshooting strategies. You'll also build interactive visualizations and deploy your apps to production. Each valuable chapter provides a new component for your reusable data wrangling toolkit. What's inside Establishing a data pipeline Acquisition, storage, and retrieval Handling unusual data sets Cleaning and preparing raw dataInteractive visualizations with D3 About the Reader Written for intermediate JavaScript developers. No data analysis experience required. About the Author Ashley Davis is a software developer, entrepreneur, author, and the creator of Data-Forge and Data-Forge Notebook, software for data transformation, analysis, and visualization in JavaScript. Table of Contents Getting started: establishing your data pipeline Getting started with Node.js Acquisition, storage, and retrieval Working with unusual data Exploratory coding Clean and prepare Dealing with huge data files Working with a mountain of data Practical data analysis Browser-based visualization Server-side visualization Live data Advanced visualization with D3 Getting to production Turn your R code into packages that others can easily download and use. This practical book shows you how to bundle reusable R functions, sample data, and documentation together by applying author Hadley Wickham's package development philosophy. In the process, you'll work with devtools, roxygen, and testthat, a set of R packages that automate common development tasks. Devtools encapsulates best practices that Hadley has learned from years of working with this programming language. Ideal for developers, data scientists, and programmers with various backgrounds, this book starts you with the basics and shows you how to improve your package writing over time. You'll learn to focus on what you want your package to do, rather than think about package structure. Learn about the most useful components of an R

package, including vignettes and unit tests Automate anything you can, taking advantage of the years of development experience embodied in devtools Get tips on good style, such as organizing functions into files Streamline your development process with devtools Learn the best way to submit your package to the Comprehensive R Archive Network (CRAN) Learn from a well-respected member of the R community who created 30 R packages, including ggplot2, dplyr, and tidyr A concise, hands-on guide with many practical examples and a detailed treatise on inference and social science research that will help you in mining data in the real world. Whether you are an undergraduate who wishes to get hands-on experience working with social data from the Web, a practitioner wishing to expand your competencies and learn unsupervised sentiment analysis, or you are simply interested in social data analysis, this book will prove to be an essential asset. No previous experience with R or statistics is required, though having knowledge of both will enrich your experience. This engaging and clearly written textbook/reference provides a must-have introduction to the rapidly emerging interdisciplinary field of data science. It focuses on the principles fundamental to becoming a good data scientist and the key skills needed to build systems for collecting, analyzing, and interpreting data. The Data Science Design Manual is a source of practical insights that highlights what really matters in analyzing data, and provides an intuitive understanding of how these core concepts can be used. The book does not emphasize any particular programming language or suite of data-analysis tools, focusing instead on high-level discussion of important design principles. This easy-to-read text ideally serves the needs of undergraduate and early graduate students embarking on an “Introduction to Data Science” course. It reveals how this discipline sits at the intersection of statistics, computer science, and machine learning, with a distinct heft and character of its own. Practitioners in these and related fields will find this book perfect for self-study as well. Additional learning tools: Contains “War Stories,” offering perspectives on how data science applies in the real world Includes “Homework Problems,” providing a wide range of exercises and projects for self-study Provides a complete set of lecture slides and online video lectures at www.data-manual.com Provides “Take-Home Lessons,” emphasizing the big-picture concepts to learn from each chapter Recommends exciting “Kaggle Challenges” from the online platform Kaggle Highlights “False Starts,” revealing the subtle reasons why certain approaches fail Offers examples taken from the data science television show “The Quant Shop” (www.quant-shop.com) Data Science in Education Using R is the go-to reference for learning data science in the education field. The book answers questions like: What does a data scientist in education do? How do I get started learning R, the popular open-source statistical programming language? And what does a data analysis project in education look like? If you’re just getting started with R in an education job, this is the book you’ll want with you. This book gets you started with R by teaching the building blocks of programming that you’ll use many times in your career. The book takes a "learn by doing" approach and offers eight analysis walkthroughs that show you a data analysis from start to finish, complete with code for you to practice with. The book finishes with how to get involved in the data science community and how to integrate data science in your education job. This book will be an essential resource for education professionals and researchers looking to increase their data analysis skills as part of their professional and academic development. Provides information on data analysis from a vareity of social networking sites, including Facebook, Twitter, and LinkedIn.