

Data Science From Scratch First Principles With Python

Data Science from Scratch

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. With this updated second edition, 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.

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Data Science from Scratch

This is a first-principles-based, practical introduction to the fundamentals of data science aimed at the mathematically-comfortable reader with some programming skills. The book covers: The important parts of Python to know The important parts of Math / Probability / Statistics to know The basics of data science How commonly-used data science techniques work (learning by implementing them) What is Map-Reduce and how to do it in Python Other applications such as NLP, Network Analysis, and more

Deep Learning from Scratch

With the resurgence of neural networks in the 2010s, deep learning has become essential for machine learning practitioners and even many software engineers. This book provides a comprehensive introduction for data scientists and software engineers with machine learning experience. You'll start with deep learning basics and move quickly to the details of important advanced architectures, implementing everything from scratch along the way. Author Seth Weidman shows you how neural networks work using a first principles approach. You'll learn how to apply multilayer neural networks, convolutional neural networks, and recurrent neural networks from the ground up. With a thorough understanding of how neural networks work mathematically, computationally, and conceptually, you'll be set up for success on all future deep learning projects. This book provides: Extremely clear and thorough mental models—accompanied by working code examples and mathematical explanations—for understanding neural networks Methods for implementing multilayer neural networks from scratch, using an easy-to-understand object-oriented framework Working implementations and clear-cut explanations of convolutional and recurrent neural networks Implementation of these neural

network concepts using the popular PyTorch framework

Doing Data Science

Now that people are aware that data can make the difference in an election or a business model, data science as an occupation is gaining ground. But how can you get started working in a wide-ranging, interdisciplinary field that's so clouded in hype? This insightful book, based on Columbia University's Introduction to Data Science class, tells you what you need to know. In many of these chapter-long lectures, data scientists from companies such as Google, Microsoft, and eBay share new algorithms, methods, and models by presenting case studies and the code they use. If you're familiar with linear algebra, probability, and statistics, and have programming experience, this book is an ideal introduction to data science. Topics include: Statistical inference, exploratory data analysis, and the data science process Algorithms Spam filters, Naive Bayes, and data wrangling Logistic regression Financial modeling Recommendation engines and causality Data visualization Social networks and data journalism Data engineering, MapReduce, Pregel, and Hadoop Doing Data Science is collaboration between course instructor Rachel Schutt, Senior VP of Data Science at News Corp, and data science consultant Cathy O'Neil, a senior data scientist at Johnson Research Labs, who attended and blogged about the course.

Data Science

A concise introduction to the emerging field of data science, explaining its evolution, relation to machine learning, current uses, data infrastructure issues, and ethical challenges. The goal of data science is to improve decision making through the analysis of data. Today data science determines the ads we see online, the books and movies that are recommended to us online, which emails are filtered into our spam folders, and even how much we pay for health insurance. This volume in the MIT Press Essential Knowledge series offers a concise introduction to the emerging field of data science, explaining its evolution, current uses, data infrastructure issues, and ethical challenges. It has never been easier for organizations to gather, store, and process data. Use of data science is driven by the rise of big data and social media, the development of high-performance computing, and the emergence of such powerful methods for data analysis and modeling as deep learning. Data science encompasses a set of principles, problem definitions, algorithms, and processes for extracting non-obvious and useful patterns from large datasets. It is closely related to the fields of data mining and machine learning, but broader in scope. This book offers a brief history of the field, introduces fundamental data concepts, and describes the stages in a data science project. It considers data infrastructure and the challenges posed by integrating data from multiple sources, introduces the basics of machine learning, and discusses how to link machine learning expertise with real-world problems. The

book also reviews ethical and legal issues, developments in data regulation, and computational approaches to preserving privacy. Finally, it considers the future impact of data science and offers principles for success in data science projects.

Data Science For Dummies

Discover how data science can help you gain in-depth insight into your business - the easy way! Jobs in data science abound, but few people have the data science skills needed to fill these increasingly important roles. Data Science For Dummies is the perfect starting point for IT professionals and students who want a quick primer on all areas of the expansive data science space. With a focus on business cases, the book explores topics in big data, data science, and data engineering, and how these three areas are combined to produce tremendous value. If you want to pick-up the skills you need to begin a new career or initiate a new project, reading this book will help you understand what technologies, programming languages, and mathematical methods on which to focus. While this book serves as a wildly fantastic guide through the broad, sometimes intimidating field of big data and data science, it is not an instruction manual for hands-on implementation. Here's what to expect: Provides a background in big data and data engineering before moving on to data science and how it's applied to generate value Includes coverage of big data frameworks like Hadoop, MapReduce, Spark, MPP platforms, and NoSQL Explains machine learning and many of its algorithms as well as artificial intelligence and the evolution of the Internet of Things Details data visualization techniques that can be used to showcase, summarize, and communicate the data insights you generate It's a big, big data world out there—let Data Science For Dummies help you harness its power and gain a competitive edge for your organization.

Data Science Projects with Python

Gain hands-on experience of Python programming with industry-standard machine learning techniques using pandas, scikit-learn, and XGBoost Key FeaturesThink critically about data and use it to form and test a hypothesisChoose an appropriate machine learning model and train it on your dataCommunicate data-driven insights with confidence and clarityBook Description If data is the new oil, then machine learning is the drill. As companies gain access to ever-increasing quantities of raw data, the ability to deliver state-of-the-art predictive models that support business decision-making becomes more and more valuable. In this book, you'll work on an end-to-end project based around a realistic data set and split up into bite-sized practical exercises. This creates a case-study approach that simulates the working conditions you'll experience in real-world data science projects. You'll learn how to use key Python packages, including pandas, Matplotlib, and scikit-learn, and master the process of data exploration and data processing, before moving on to fitting, evaluating, and tuning algorithms such as regularized logistic regression and random forest. Now in its second edition, this book will take you through the end-to-

end process of exploring data and delivering machine learning models. Updated for 2021, this edition includes brand new content on XGBoost, SHAP values, algorithmic fairness, and the ethical concerns of deploying a model in the real world. By the end of this data science book, you'll have the skills, understanding, and confidence to build your own machine learning models and gain insights from real data. What you will learn

- Load, explore, and process data using the pandas Python package
- Use Matplotlib to create compelling data visualizations
- Implement predictive machine learning models with scikit-learn
- Use lasso and ridge regression to reduce model overfitting
- Evaluate random forest and logistic regression model performance
- Deliver business insights by presenting clear, convincing conclusions

Who this book is for

Data Science Projects with Python – Second Edition is for anyone who wants to get started with data science and machine learning. If you're keen to advance your career by using data analysis and predictive modeling to generate business insights, then this book is the perfect place to begin. To quickly grasp the concepts covered, it is recommended that you have basic experience of programming with Python or another similar language, and a general interest in statistics.

Python for Data Analysis

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

Data Science Job: How to become a Data Scientist

We're living in a digital world. Most of our global economy is digital and the sheer volume of data is stupendous. It's 2020 and we're living in the future. Data Scientist is one of the hottest job on the market right now. Demand for data science is huge and will only grow, and it seems like it will grow much faster than the actual number of data scientists. So if you want to make a career change and become a data scientist, now is the time. This book will guide you through the process. From my experience of working with multiple companies as a project manager, a data

science consultant or a CTO, I was able to see the process of hiring data scientists and building data science teams. I know what's important to land your first job as a data scientist, what skills you should acquire, what you should show during a job interview.

A Hands-On Introduction to Data Science

An introductory textbook offering a low barrier entry to data science; the hands-on approach will appeal to students from a range of disciplines.

Data Science Using Python and R

Learn data science by doing data science! Data Science Using Python and R will get you plugged into the world's two most widespread open-source platforms for data science: Python and R. Data science is hot. Bloomberg called data scientist "the hottest job in America." Python and R are the top two open-source data science tools in the world. In Data Science Using Python and R, you will learn step-by-step how to produce hands-on solutions to real-world business problems, using state-of-the-art techniques. Data Science Using Python and R is written for the general reader with no previous analytics or programming experience. An entire chapter is dedicated to learning the basics of Python and R. Then, each chapter presents step-by-step instructions and walkthroughs for solving data science problems using Python and R. Those with analytics experience will appreciate having a one-stop shop for learning how to do data science using Python and R. Topics covered include data preparation, exploratory data analysis, preparing to model the data, decision trees, model evaluation, misclassification costs, naïve Bayes classification, neural networks, clustering, regression modeling, dimension reduction, and association rules mining. Further, exciting new topics such as random forests and general linear models are also included. The book emphasizes data-driven error costs to enhance profitability, which avoids the common pitfalls that may cost a company millions of dollars. Data Science Using Python and R provides exercises at the end of every chapter, totaling over 500 exercises in the book. Readers will therefore have plenty of opportunity to test their newfound data science skills and expertise. In the Hands-on Analysis exercises, readers are challenged to solve interesting business problems using real-world data sets.

Hands-On Data Science and Python Machine Learning

This book covers the fundamentals of machine learning with Python in a concise and dynamic manner. It covers data mining and large-scale machine learning using Apache Spark. About This Book Take your first steps in the world of data science by understanding the tools and techniques of data analysis Train efficient Machine

Learning models in Python using the supervised and unsupervised learning methods
Learn how to use Apache Spark for processing Big Data efficiently
Who This Book Is For
If you are a budding data scientist or a data analyst who wants to analyze and gain actionable insights from data using Python, this book is for you. Programmers with some experience in Python who want to enter the lucrative world of Data Science will also find this book to be very useful, but you don't need to be an expert Python coder or mathematician to get the most from this book.
What You Will Learn
Learn how to clean your data and ready it for analysis
Implement the popular clustering and regression methods in Python
Train efficient machine learning models using decision trees and random forests
Visualize the results of your analysis using Python's Matplotlib library
Use Apache Spark's MLlib package to perform machine learning on large datasets
In Detail
Join Frank Kane, who worked on Amazon and IMDb's machine learning algorithms, as he guides you on your first steps into the world of data science. Hands-On Data Science and Python Machine Learning gives you the tools that you need to understand and explore the core topics in the field, and the confidence and practice to build and analyze your own machine learning models. With the help of interesting and easy-to-follow practical examples, Frank Kane explains potentially complex topics such as Bayesian methods and K-means clustering in a way that anybody can understand them. Based on Frank's successful data science course, Hands-On Data Science and Python Machine Learning empowers you to conduct data analysis and perform efficient machine learning using Python. Let Frank help you unearth the value in your data using the various data mining and data analysis techniques available in Python, and to develop efficient predictive models to predict future results. You will also learn how to perform large-scale machine learning on Big Data using Apache Spark. The book covers preparing your data for analysis, training machine learning models, and visualizing the final data analysis.
Style and approach
This comprehensive book is a perfect blend of theory and hands-on code examples in Python which can be used for your reference at any time.

Python Data Science Handbook

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

Think Like a Data Scientist

Summary Think Like a Data Scientist presents a step-by-step approach to data science, combining analytic, programming, and business perspectives into easy-to-digest techniques and thought processes for solving real world data-centric problems. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Data collected from customers, scientific measurements, IoT sensors, and so on is valuable only if you understand it. Data scientists revel in the interesting and rewarding challenge of observing, exploring, analyzing, and interpreting this data. Getting started with data science means more than mastering analytic tools and techniques, however; the real magic happens when you begin to think like a data scientist. This book will get you there. About the Book Think Like a Data Scientist teaches you a step-by-step approach to solving real-world data-centric problems. By breaking down carefully crafted examples, you'll learn to combine analytic, programming, and business perspectives into a repeatable process for extracting real knowledge from data. As you read, you'll discover (or remember) valuable statistical techniques and explore powerful data science software. More importantly, you'll put this knowledge together using a structured process for data science. When you've finished, you'll have a strong foundation for a lifetime of data science learning and practice. What's Inside The data science process, step-by-step How to anticipate problems Dealing with uncertainty Best practices in software and scientific thinking About the Reader Readers need beginner programming skills and knowledge of basic statistics. About the Author Brian Godsey has worked in software, academia, finance, and defense and has launched several data-centric start-ups. Table of Contents PART 1 - PREPARING AND GATHERING DATA AND KNOWLEDGE Philosophies of data science Setting goals by asking good questions Data all around us: the virtual wilderness Data wrangling: from capture to domestication Data assessment: poking and prodding PART 2 - BUILDING A PRODUCT WITH SOFTWARE AND STATISTICS Developing a plan Statistics and modeling: concepts and foundations Software: statistics in action Supplementary software: bigger, faster, more efficient Plan execution: putting it all together PART 3 - FINISHING OFF THE PRODUCT AND WRAPPING UP Delivering a product After product delivery: problems and revisions Wrapping up: putting the project away

Introduction to Data Science

This accessible and classroom-tested textbook/reference presents an introduction to the fundamentals of the emerging and interdisciplinary field of data science. The

coverage spans key concepts adopted from statistics and machine learning, useful techniques for graph analysis and parallel programming, and the practical application of data science for such tasks as building recommender systems or performing sentiment analysis. Topics and features: provides numerous practical case studies using real-world data throughout the book; supports understanding through hands-on experience of solving data science problems using Python; describes techniques and tools for statistical analysis, machine learning, graph analysis, and parallel programming; reviews a range of applications of data science, including recommender systems and sentiment analysis of text data; provides supplementary code resources and data at an associated website.

Ten Essays on Fizz Buzz

"This book is so good. I wish I'd written it." -- Tim Hopper (@tdhopper)"Highly recommended: a grand tour of computer science theory and practical software engineering, explored through the lens of 10 Fizz Buzz solutions in Python. Outstanding." -- Paco Nathan (@pacoid)"I'd never have thought a book about Fizz Buzz would make me a better programmer, but I was wrong. Joel in the course of 10 chapters does a broad survey of core Python concepts, software design and testing, mathematics, and more (including deep learning) using Fizz Buzz as the guiding example. It's that rare technical book that remains engaging, entertaining, and accessible." -- Binal Patel (@binalkp91)More real Python tips than any "Python tricks" book! From a Python beginner to an experienced ML practitioner, you're bound to learn something about the language and its application to a progressive level of algorithmic applications. Recommended for the anyone looking to "level up" their Python or problem solving skills! -- Tom Marthaler (@tmarthal)Fizz Buzz is the following (simple) problem: Print the numbers from 1 to 100, except that if the number is divisible by 3, instead print "fizz"; if the number is divisible by 5, instead print "buzz"; and if the number is divisible by 15, instead print "fizzbuzz". It originated as a children's game, but has since taken on a new life as a lowest-common-denominator litmus test for assessing computer programmers. If you are an experienced programmer, it is an extremely easy problem to solve. Because of this, it has taken on a third life as the prototypical bad interview problem. Everyone knows that it's the question you ask people to make sure that they're not completely incompetent as programmers. Accordingly, if your interviewer asks you to solve it, he's suggesting he thinks it possible that you're completely incompetent as a programmer. You would not be wrong to feel insulted! My association with this problem began in 2016, when I wrote a blog post called Fizz Buzz in Tensorflow, the (possibly fictional) story of one such insulted programmer who decided to show up his interviewer by approaching Fizz Buzz as a deep learning problem. This post went modestly viral, and ever since then I have been seen as a thought leader in the Fizz Buzz space. Accordingly, over the years I have come up with and/or collected various other stupid and/or clever ways of solving Fizz Buzz. I have not blogged about them, as I am not the sort of person who beats a joke to death, but occasionally I will tweet about them, and recently in response someone suggested

that I write a book on "100 Ways of Writing Fizz Buzz in Python." Now, I could probably come up with 100 ways of solving Fizz Buzz, but most of them would not be very interesting. Luckily for you, I was able to come up with 10 that are interesting in various ways, each of which turned out to be a good launching-off point for (sometimes meandering) discussions of various aspects of coding, Python, Fizz Buzz, mathematics, software design, technical interviewing, and various other topics. Hence "Ten Essays on Fizz Buzz". In many ways this is a strange book. Its goal is not to teach you a specific field or a specific technology. I hope you will learn a lot from reading it, but it's not really a book that you'd read in order to learn anything in particular. Most technical books are about specific technical topics; this one sort of isn't. Nonetheless, it is a technical book. Each essay contains code that implements a different solution of Fizz Buzz. Each essay uses code to illustrate its ideas. Each essay represents my current best thinking about how to solve problems using code. If you have a coding job, you should feel no reluctance to expense this book to your employer

Python for Probability, Statistics, and Machine Learning

This book, fully updated for Python version 3.6+, covers the key ideas that link probability, statistics, and machine learning illustrated using Python modules in these areas. All the figures and numerical results are reproducible using the Python codes provided. The author develops key intuitions in machine learning by working meaningful examples using multiple analytical methods and Python codes, thereby connecting theoretical concepts to concrete implementations. Detailed proofs for certain important results are also provided. Modern Python modules like Pandas, Sympy, Scikit-learn, Tensorflow, and Keras are applied to simulate and visualize important machine learning concepts like the bias/variance trade-off, cross-validation, and regularization. Many abstract mathematical ideas, such as convergence in probability theory, are developed and illustrated with numerical examples. This updated edition now includes the Fisher Exact Test and the Mann-Whitney-Wilcoxon Test. A new section on survival analysis has been included as well as substantial development of Generalized Linear Models. The new deep learning section for image processing includes an in-depth discussion of gradient descent methods that underpin all deep learning algorithms. As with the prior edition, there are new and updated *Programming Tips* that illustrate effective Python modules and methods for scientific programming and machine learning. There are 445 run-able code blocks with corresponding outputs that have been tested for accuracy. Over 158 graphical visualizations (almost all generated using Python) illustrate the concepts that are developed both in code and in mathematics. We also discuss and use key Python modules such as Numpy, Scikit-learn, Sympy, Scipy, Lifelines, CvxPy, Theano, Matplotlib, Pandas, Tensorflow, Statsmodels, and Keras. This book is suitable for anyone with an undergraduate-level exposure to probability, statistics, or machine learning and with rudimentary knowledge of Python programming.

Practical Statistics for Data Scientists

Statistical methods are a key part of data science, yet very few data scientists have any formal statistics training. Courses and books on basic statistics rarely cover the topic from a data science perspective. This practical guide explains how to apply various statistical methods to data science, tells you how to avoid their misuse, and gives you advice on what's important and what's not. Many data science resources incorporate statistical methods but lack a deeper statistical perspective. If you're familiar with the R programming language, and have some exposure to statistics, this quick reference bridges the gap in an accessible, readable format. With this book, you'll learn: Why exploratory data analysis is a key preliminary step in data science How random sampling can reduce bias and yield a higher quality dataset, even with big data How the principles of experimental design yield definitive answers to questions How to use regression to estimate outcomes and detect anomalies Key classification techniques for predicting which categories a record belongs to Statistical machine learning methods that "learn" from data Unsupervised learning methods for extracting meaning from unlabeled data

Building Machine Learning Powered Applications

Learn the skills necessary to design, build, and deploy applications powered by machine learning (ML). Through the course of this hands-on book, you'll build an example ML-driven application from initial idea to deployed product. Data scientists, software engineers, and product managers—including experienced practitioners and novices alike—will learn the tools, best practices, and challenges involved in building a real-world ML application step by step. Author Emmanuel Ameisen, an experienced data scientist who led an AI education program, demonstrates practical ML concepts using code snippets, illustrations, screenshots, and interviews with industry leaders. Part I teaches you how to plan an ML application and measure success. Part II explains how to build a working ML model. Part III demonstrates ways to improve the model until it fulfills your original vision. Part IV covers deployment and monitoring strategies. This book will help you: Define your product goal and set up a machine learning problem Build your first end-to-end pipeline quickly and acquire an initial dataset Train and evaluate your ML models and address performance bottlenecks Deploy and monitor your models in a production environment

Data Science for Business

Written by renowned data science experts Foster Provost and Tom Fawcett, Data Science for Business introduces the fundamental principles of data science, and walks you through the "data-analytic thinking" necessary for extracting useful knowledge and business value from the data you collect. This guide also helps you

understand the many data-mining techniques in use today. Based on an MBA course Provost has taught at New York University over the past ten years, Data Science for Business provides examples of real-world business problems to illustrate these principles. You'll not only learn how to improve communication between business stakeholders and data scientists, but also how participate intelligently in your company's data science projects. You'll also discover how to think data-analytically, and fully appreciate how data science methods can support business decision-making. Understand how data science fits in your organization—and how you can use it for competitive advantage Treat data as a business asset that requires careful investment if you're to gain real value Approach business problems data-analytically, using the data-mining process to gather good data in the most appropriate way Learn general concepts for actually extracting knowledge from data Apply data science principles when interviewing data science job candidates

Practical Data Science with Python

Learn to effectively manage data and execute data science projects from start to finish using Python Key Features Understand and utilize data science tools in Python, such as specialized machine learning algorithms and statistical modeling Build a strong data science foundation with the best data science tools available in Python Add value to yourself, your organization, and society by extracting actionable insights from raw data Book 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 learn Use Python data science packages effectively Clean and prepare data for data science work, including feature engineering and feature selection Data modeling, including classic statistical models (such as t-tests), and essential machine learning algorithms, such as random forests and boosted models Evaluate model performance Compare and understand different machine learning methods Interact with Excel spreadsheets through Python Create automated data science reports through Python Get to grips with text analytics techniques Who 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.

Data Science from Scratch

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.

The Data Science Handbook

Summary Introducing Data Science teaches you how to accomplish the fundamental tasks that occupy data scientists. Using the Python language and common Python libraries, you'll experience firsthand the challenges of dealing with data at scale and gain a solid foundation in data science. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Many companies need developers with data science skills to work on projects ranging from social media marketing to machine learning. Discovering what you need to learn to begin a career as a data scientist can seem bewildering. This book is designed to help you get started. About the Book Introducing Data Science Introducing Data Science explains vital data science concepts and teaches you how to accomplish the fundamental tasks that occupy data scientists. You'll explore data visualization, graph databases, the use of NoSQL, and the data science process. You'll use the Python language and common Python libraries as you experience firsthand the challenges of dealing with data at scale. Discover how Python allows you to gain insights from data sets so big that they need to be stored on multiple machines, or from data moving so quickly that no single machine can handle it. This book gives you hands-on experience with the most popular Python data science libraries, Scikit-learn and StatsModels. After reading this book, you'll have the solid foundation you need to start a career in data science. What's Inside Handling large data Introduction to machine learning Using Python to work with data Writing data science algorithms About the Reader This book assumes you're comfortable reading code in Python or a similar language, such as C, Ruby, or JavaScript. No prior experience with data science is required. About the Authors Davy Cielen, Arno D. B. Meysman, and Mohamed Ali are the founders and managing partners of Optimately and Maiton, where they focus on developing data science projects and solutions in various sectors. Table of Contents Data science in a big data world The data science process Machine learning Handling large data on a single computer First steps in big data Join the NoSQL movement The rise of graph databases Text mining and text analytics Data visualization to the end user

Introducing Data Science

Distills key concepts from linear algebra, geometry, matrices, calculus, optimization, probability and statistics that are used in machine learning.

Mathematics for Machine Learning

Gain hands-on experience with industry-standard data analysis and machine

learning tools in Python
Key Features
Tackle data science problems by identifying the problem to be solved
Illustrate patterns in data using appropriate visualizations
Implement suitable machine learning algorithms to gain insights from data
Book Description
Data Science Projects with Python is designed to give you practical guidance on industry-standard data analysis and machine learning tools, by applying them to realistic data problems. You will learn how to use pandas and Matplotlib to critically examine datasets with summary statistics and graphs, and extract the insights you seek to derive. You will build your knowledge as you prepare data using the scikit-learn package and feed it to machine learning algorithms such as regularized logistic regression and random forest. You'll discover how to tune algorithms to provide the most accurate predictions on new and unseen data. As you progress, you'll gain insights into the working and output of these algorithms, building your understanding of both the predictive capabilities of the models and why they make these predictions. By the end of this book, you will have the necessary skills to confidently use machine learning algorithms to perform detailed data analysis and extract meaningful insights from unstructured data.

What you will learn
Install the required packages to set up a data science coding environment
Load data into a Jupyter notebook running Python
Use Matplotlib to create data visualizations
Fit machine learning models using scikit-learn
Use lasso and ridge regression to regularize your models
Compare performance between models to find the best outcomes
Use k-fold cross-validation to select model hyperparameters
Who this book is for
If you are a data analyst, data scientist, or business analyst who wants to get started using Python and machine learning techniques to analyze data and predict outcomes, this book is for you. Basic knowledge of Python and data analytics will help you get the most from this book. Familiarity with mathematical concepts such as algebra and basic statistics will also be useful.

Data Science Projects with Python

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

Think Stats

You must understand algorithms to get good at machine learning. The problem is that they are only ever explained using Math. No longer. In this Ebook, finally cut through the math and learn exactly how machine learning algorithms work. Using clear explanations, simple pure Python code (no libraries!) and step-by-step tutorials you will discover how to load and prepare data, evaluate model skill, and implement a suite of linear, nonlinear and ensemble machine learning algorithms from scratch.

Machine Learning Algorithms From Scratch with Python

Many Python developers are curious about what machine learning is and how it can be concretely applied to solve issues faced in businesses handling medium to large amount of data. Machine Learning with Python teaches you the basics of machine learning and provides a thorough hands-on understanding of the subject. You'll learn important machine learning concepts and algorithms, when to use them, and how to use them. The book will cover a machine learning workflow: data preprocessing and working with data, training algorithms, evaluating results, and implementing those algorithms into a production-level system.

Introduction to Machine Learning with Python

Python Data Analytics will help you tackle the world of data acquisition and analysis using the power of the Python language. At the heart of this book lies the coverage of pandas, an open source, BSD-licensed library providing high-performance, easy-to-use data structures and data analysis tools for the Python programming language. Author Fabio Nelli expertly shows the strength of the Python programming language when applied to processing, managing and retrieving information. Inside, you will see how intuitive and flexible it is to discover and communicate meaningful patterns of data using Python scripts, reporting systems, and data export. This book examines how to go about obtaining, processing, storing, managing and analyzing data using the Python programming language. You will use Python and other open source tools to wrangle data and tease out interesting and important trends in that data that will allow you to predict future patterns. Whether you are dealing with sales data, investment data (stocks, bonds, etc.), medical data, web page usage, or any other type of data set, Python can be used to interpret, analyze, and glean information from a pile of numbers and statistics. This book is an invaluable reference with its examples of storing and accessing data in a database; it walks you through the process of report generation;

it provides three real world case studies or examples that you can take with you for your everyday analysis needs.

Python Data Analytics

Leverage the power of the Python data science libraries and advanced machine learning techniques to analyse large unstructured datasets and predict the occurrence of a particular future event. Key Features Explore the depths of data science, from data collection through to visualization Learn pandas, scikit-learn, and Matplotlib in detail Study various data science algorithms using real-world datasets

Book Description Data Science with Python begins by introducing you to data science and teaches you to install the packages you need to create a data science coding environment. You will learn three major techniques in machine learning: unsupervised learning, supervised learning, and reinforcement learning. You will also explore basic classification and regression techniques, such as support vector machines, decision trees, and logistic regression. As you make your way through chapters, you will study the basic functions, data structures, and syntax of the Python language that are used to handle large datasets with ease. You will learn about NumPy and pandas libraries for matrix calculations and data manipulation, study how to use Matplotlib to create highly customizable visualizations, and apply the boosting algorithm XGBoost to make predictions. In the concluding chapters, you will explore convolutional neural networks (CNNs), deep learning algorithms used to predict what is in an image. You will also understand how to feed human sentences to a neural network, make the model process contextual information, and create human language processing systems to predict the outcome. By the end of this book, you will be able to understand and implement any new data science algorithm and have the confidence to experiment with tools or libraries other than those covered in the book. What you will learn

Pre-process data to make it ready to use for machine learning
Create data visualizations with Matplotlib
Use scikit-learn to perform dimension reduction using principal component analysis (PCA)
Solve classification and regression problems
Get predictions using the XGBoost library
Process images and create machine learning models to decode them
Process human language for prediction and classification
Use TensorBoard to monitor training metrics in real time
Find the best hyperparameters for your model with AutoML

Who this book is for Data Science with Python is designed for data analysts, data scientists, database engineers, and business analysts who want to move towards using Python and machine learning techniques to analyze data and predict outcomes. Basic knowledge of Python and data analytics will prove beneficial to understand the various concepts explained through this book.

Data Science with Python

Leverage the numerical and mathematical modules in Python and its standard library as well as popular open source numerical Python packages like NumPy,

SciPy, FiPy, matplotlib and more. This fully revised edition, updated with the latest details of each package and changes to Jupyter projects, demonstrates how to numerically compute solutions and mathematically model applications in big data, cloud computing, financial engineering, business management and more. Numerical Python, Second Edition, presents many brand-new case study examples of applications in data science and statistics using Python, along with extensions to many previous examples. Each of these demonstrates the power of Python for rapid development and exploratory computing due to its simple and high-level syntax and multiple options for data analysis. After reading this book, readers will be familiar with many computing techniques including array-based and symbolic computing, visualization and numerical file I/O, equation solving, optimization, interpolation and integration, and domain-specific computational problems, such as differential equation solving, data analysis, statistical modeling and machine learning. What You'll Learn Work with vectors and matrices using NumPy Plot and visualize data with Matplotlib Perform data analysis tasks with Pandas and SciPy Review statistical modeling and machine learning with statsmodels and scikit-learn Optimize Python code using Numba and Cython Who This Book Is For Developers who want to understand how to use Python and its related ecosystem for numerical computing.

Numerical Python

Create powerful data visualizations and unlock intelligent business insights with Tableau Key Features Explore all the latest Tableau 2019 features and redefine business analytics for your organization Create impressive data visualizations and interactive dashboards to get insights from your data Learn effective data storytelling to transform how your business leverages data and makes decisions Book Description Tableau is the gold standard of business intelligence and visual analytics tools in every industry. It enables rapid data visualization and interpretation with charts, graphs, dashboards, and much more. Updated with the latest features of Tableau, this book takes you from the foundations of the Tableau 2019 paradigm through to advanced topics. This third edition of the bestselling guide by Tableau Zen Master, Joshua Milligan, will help you come to grips with updated features, such as set actions and transparent views. Beginning with installation, you'll create your first visualizations with Tableau and then explore practical examples and advanced techniques. You'll create bar charts, tree maps, scatterplots, time series, and a variety of other visualizations. Next, you'll discover techniques to overcome challenges presented by data structure and quality and engage in effective data storytelling and decision making with business critical information. Finally, you'll be introduced to Tableau Prep, and learn how to use it to integrate and shape data for analysis. By the end of this book, you will be equipped to leverage the powerful features of Tableau 2019 for decision making. What you will learn Develop stunning visualizations that explain complexity with clarity Explore the exciting new features of Tableau Desktop and Tableau Prep Connect to various data sources to bring all your data together Uncover techniques to prep and structure your data for easy analysis Create and use calculations to solve problems

and enrich analyticsMaster advanced topics such as sets, LOD calcs, and much moreEnable smart decisions with clustering, distribution, and forecastingShare your data stories to build a culture of trust and actionWho this book is for This Tableau book is for anyone who wants to understand data. If you're new to Tableau, don't worry. This book builds on the foundations to help you understand how Tableau really works and then builds on that knowledge with practical examples before moving on to advanced techniques. Working experience with databases will be useful but is not necessary to get the most out of this book.

Learning Tableau 2019

Explore fundamental to advanced Python 3 topics in six steps, all designed to make you a worthy practitioner. This updated version's approach is based on the "six degrees of separation" theory, which states that everyone and everything is a maximum of six steps away and presents each topic in two parts: theoretical concepts and practical implementation using suitable Python 3 packages. You'll start with the fundamentals of Python 3 programming language, machine learning history, evolution, and the system development frameworks. Key data mining/analysis concepts, such as exploratory analysis, feature dimension reduction, regressions, time series forecasting and their efficient implementation in Scikit-learn are covered as well. You'll also learn commonly used model diagnostic and tuning techniques. These include optimal probability cutoff point for class creation, variance, bias, bagging, boosting, ensemble voting, grid search, random search, Bayesian optimization, and the noise reduction technique for IoT data. Finally, you'll review advanced text mining techniques, recommender systems, neural networks, deep learning, reinforcement learning techniques and their implementation. All the code presented in the book will be available in the form of iPython notebooks to enable you to try out these examples and extend them to your advantage. What You'll Learn Understand machine learning development and frameworks Assess model diagnosis and tuning in machine learning Examine text mining, natural language processing (NLP), and recommender systems Review reinforcement learning and CNN Who This Book Is For Python developers, data engineers, and machine learning engineers looking to expand their knowledge or career into machine learning area.

Mastering Machine Learning with Python in Six Steps

Providing code examples in python, this book introduces the concepts of machine learning with mathematical explanations and programming fundamentals. --

Machine Learning with Python

Introduction to Data Science: Data Analysis and Prediction Algorithms with R introduces concepts and skills that can help you tackle real-world data analysis challenges. It covers concepts from probability, statistical inference, linear regression, and machine learning. It also helps you develop skills such as R programming, data wrangling, data visualization, predictive algorithm building, file organization with UNIX/Linux shell, version control with Git and GitHub, and reproducible document preparation. This book is a textbook for a first course in data science. No previous knowledge of R is necessary, although some experience with programming may be helpful. The book is divided into six parts: R, data visualization, statistics with R, data wrangling, machine learning, and productivity tools. Each part has several chapters meant to be presented as one lecture. The author uses motivating case studies that realistically mimic a data scientist's experience. He starts by asking specific questions and answers these through data analysis so concepts are learned as a means to answering the questions. Examples of the case studies included are: US murder rates by state, self-reported student heights, trends in world health and economics, the impact of vaccines on infectious disease rates, the financial crisis of 2007-2008, election forecasting, building a baseball team, image processing of hand-written digits, and movie recommendation systems. The statistical concepts used to answer the case study questions are only briefly introduced, so complementing with a probability and statistics textbook is highly recommended for in-depth understanding of these concepts. If you read and understand the chapters and complete the exercises, you will be prepared to learn the more advanced concepts and skills needed to become an expert.

Introduction to Data Science

Probability and Statistics for Data Science: Math + R + Data covers "math stat"—distributions, expected value, estimation etc.—but takes the phrase "Data Science" in the title quite seriously: * Real datasets are used extensively. * All data analysis is supported by R coding. * Includes many Data Science applications, such as PCA, mixture distributions, random graph models, Hidden Markov models, linear and logistic regression, and neural networks. * Leads the student to think critically about the "how" and "why" of statistics, and to "see the big picture." * Not "theorem/proof"-oriented, but concepts and models are stated in a mathematically precise manner. Prerequisites are calculus, some matrix algebra, and some experience in programming. Norman Matloff is a professor of computer science at the University of California, Davis, and was formerly a statistics professor there. He is on the editorial boards of the Journal of Statistical Software and The R Journal. His book Statistical Regression and Classification: From Linear Models to Machine Learning was the recipient of the Ziegel Award for the best book reviewed in Technometrics in 2017. He is a recipient of his university's Distinguished Teaching Award.

Probability and Statistics for Data Science

If you're a student studying computer science or a software developer preparing for technical interviews, this practical book will help you learn and review some of the most important ideas in software engineering—data structures and algorithms—in a way that's clearer, more concise, and more engaging than other materials. By emphasizing practical knowledge and skills over theory, author Allen Downey shows you how to use data structures to implement efficient algorithms, and then analyze and measure their performance. You'll explore the important classes in the Java collections framework (JCF), how they're implemented, and how they're expected to perform. Each chapter presents hands-on exercises supported by test code online. Use data structures such as lists and maps, and understand how they work Build an application that reads Wikipedia pages, parses the contents, and navigates the resulting data tree Analyze code to predict how fast it will run and how much memory it will require Write classes that implement the Map interface, using a hash table and binary search tree Build a simple web search engine with a crawler, an indexer that stores web page contents, and a retriever that returns user query results Other books by Allen Downey include Think Java, Think Python, Think Stats, and Think Bayes.

Think Data Structures

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