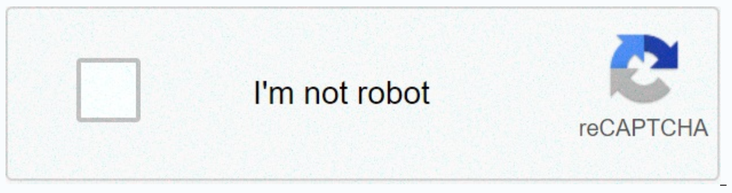

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Python data science handbook pdf github

You are not performing that action at this time. You're signed in with a different tab or window. Reload to refresh your session. You've opted out of another tab or window. Reload to refresh your session. This repository contains the entire Python Data Science Handbook, in the form of (free!) Jupyter notebooks. How to use this book about the book has been written and tested with Python 3.5, although other Python versions (including Python 2.7) should work in almost all cases. The book introduces the main libraries that are essential for working with data in Python: in particular, IPython, NumPy, Pandas, Matplotlib, Scikit-Learn and related packages. Familiarity with Python as a language is assumed; if you need a quick introduction to the language itself, see the free companion project A Whirlwind Tour of Python: it's a quick introduction to the Python language aimed at researchers and scientists. For an index of the notebooks available to guide the text, see Index.ipynb. Software The code in the book has been tested with Python 3.5, although most (but not all) will also work correctly with Python 2.7 and other older Python versions. The packages I used to run the code in the book are included in requirements.txt (Note that some of these exact version numbers may not be available on your platform: you may need to customize them for your own use). To install the requirements using conda, Run the following on the command line: $conda installation file requirements.txt To create a standalone environment called PDSH with Python 3.5 and all required package versions, run the following: Create $conda -n PDSH python=3.5 -file requirements.txt you learn more about using conda environments in the Managing Environments section of the conda documentation. License code The code in this repository, including all code samples in the notebooks above, is released under the MIT license. Read more at the Open Source Initiative. Text The text content of the book is released under the CC-BY-NC-ND license. Read more at Creative Commons. Page 2 View 1.7k Star 27.4k Fork 12.1k You are not currently performing that action. You're signed in with a different tab or window. Reload to refresh your session. You've opted out of another tab or window. Reload to refresh your session. Python Data Science Handbook: Essential Tools for Working with Data By Jake VanderPlas Page 2 You can't perform that action at this time. You're signed in with a different tab or window. Reload to refresh your session. You've opted out of another tab or window. Reload to refresh your session. Jake VanderPlas This is a book on data science do with Python that immediately demands what is data science? It's a surprisingly harsh definition to nail down, especially considering how ubiquitous the term has become. Vocal critics have dismissed the term as a superfluous label (after all, what science does not mean or a simple buzzword that only exists to salt resumes and catch the eye of overzealous tech recruiters.

In my mind, these critiques are missing something important. Data science, despite its hype-laden veneer, is perhaps the best label we have for the cross-disciplinary set of skills that are becoming increasingly important in many applications in industry and academia. This multidisciplinary piece is key: in my view, the best extisting definition of data science is illustrated by Drew Conway's Data Science Venn Diagram, first published on his blog in September 2010: (Source: [Drew Conway](. Used with permission.) While some of the intersection labels are a bit tongue-in-cheek, this diagram captures the essence of what I think people mean when they say data science: it's fundamentally an interdisciplinary topic. Data science consists of three different and overlapping areas: the skills of a statistician who knows how to model and summarize datasets (which are getting bigger); the skills of a computer scientist who can design and use algorithms to efficiently store, process and visualize this data; and the domain expertise – what we might see as classic training in a topic – is needed to both formulate the right questions and to put their answers into context. With this in mind, I would encourage you to think of data science not as a new domain of knowledge to learn, but a new set of skills that you apply within your current field of expertise. Whether you're reporting election results, predicting inventory returns, optimizing online ad clicks, identifying microorganisms in microorganisms, looking for new classes of astronomical objects, or working with data in another area, the purpose of this book is to give you the ability to ask and answer new questions about your chosen topic area. In my teaching both at the University of Washington and at various tech-focused conferences and meetups, one of the most common questions I've heard is this: how should I learn Python? The people who ask are generally technically minded students, developers, or researchers, often with an already strong background in writing code and using computational and numerical tools. Most of these people don't want to learn python per se, but want to learn the language with the goal of using it as a tool for data-intensive and computational science. While a large patchwork of videos, blog posts and tutorials is available to this audience online, I have long been frustrated by the of a good answer to this question; that's what inspired this book. The book is not intended as an introduction to Python or programming in general; I assume that the reader is familiar with the Python language, including defining functions, assigning variables, calling objects, program and other basic tasks. Instead, it aims to help Python users learn to use Python's data science stack libraries such as IPython, NumPy, Pandas, Matplotlib, Scikit-Learn and related tools to effectively store, manipulate, and understand data. Python has emerged in recent decades as a first-class tool for scientific computing tasks, including the analysis and visualization of large datasets. This may have come as a surprise to early proponents of the Python language: the language itself was not specifically designed with data analysis or scientific computing in mind. Python's usefulness for data science stems primarily from the large and active ecosystem of third-party packages: NumPy for manipulation of homogeneous array-based data, Pandas for manipulation of heterogeneous and labeled data, SciPy for common scientific computing tasks, Matplotlib for visualizations of publication quality, IPython for interactive execution and code sharing, Scikit-Learn for learning machine and many more tools that will be listed on the following pages. If you are looking for a guide to the Python language itself, I would suggest the sister project to this book, A Whirlwind Tour of the Python Language. This short report gives a tour of the essential features of the Python language, aimed at data scientists who are already familiar with one or more other programming languages. This book uses python 3 syntax, which includes language enhancements that are not compatible with Python's 2.x series. Although Python 3.0 was first released in 2008, adoption has been relatively slow, especially in the scientific and web development communities. This is mainly because it took some time for many of the essential third-party packages and toolkits to be compatible with the new language internals. Since the beginning of 2014, stable releases of key tools in the data science ecosystem have been fully compatible with both Python 2 and 3, so this book will use the newer Python 3 syntax. However, the vast majority of the code excerpts in this book will also work without modification in Python 2: in cases where a Py2 incompatible syntax is used, I will make every effort to explicitly note it. Each chapter of this book focuses on a particular package or tool that carries a basic piece of the Python Data Sciece story. IPython and Jupyter: these packages provide the computational environment in which many Python-using data scientists work. NumPy: This library provides the ndarray for efficient storage and manipulation of dense dataarrays in Python. Pandas: This library provides the DataFrame for efficient storage and manipulation of in Python. Matplotlib: This library offers opportunities for a flexible range of data visualizations in Python. Scikit-Learn: This Library Library efficient & clean Python implementations of key and most established machine learning algorithms. The PyData world is certainly much larger than these five packages, and is growing every day. With this in mind, I make every attempt through these pages to provide references to other interesting efforts, projects and packages that push the boundaries of what can be done in Python. Nevertheless, these five are currently fundamental to much of the work being done in the Python data science space, and I expect they will continue to be important even as the ecosystem around them continues to grow. Additional material (code samples, numbers, etc.) can be downloaded on . This book is here to help you get your work done. In general, if sample code is offered with this book, you use it in your programs and documentation. You do not need to contact us for permission unless you reproduce a significant portion of the code. For example, writing a program that uses multiple pieces of code from this book does not require permission. However, permission is required to sell or distribute a CD-ROM of examples from O'Reilly books. Answering a question by quoting this book and quoting sample code does not require permission. Including a significant amount of sample code from this book in your product's documentation does require permission. We appreciate, but do not require attribution. An attribution usually includes the title, author, publisher and ISBN. For example: The Python Data Science Handbook by Jake VanderPlas (O'Reilly). Copyright 2016 Jake VanderPlas, 978-1-491-91205-8. If you feel that your use of code examples is outside fair use or the above mission, please contact us on permissions@oreilly.com. Installing Python and the suite of libraries that enable scientific computing is easy. This section describes some considerations when setting up your computer. While there are several ways to install Python, the one I would suggest for use in data science is the Anaconda distribution, which works the same way whether you use Windows, Linux, or Mac OS X. The Anaconda distribution comes in two flavors: Miniconda gives you the Python interpreter itself, along with a command-line tool called conda that works as a cross-platform package manager focused on Python packages, similar to the apt or yum tools that Linux users might be familiar with. Anaconda includes both Python and conda, and also bundles a range of other pre-installed packages focused on scientific computing. Due to the size of this bundle, expect the installation to use disk space. One of the packages that comes with Anaconda can also be installed manually on top of Miniconda; for this reason I suggest starting with To get started, download and install the Miniconda package - make sure you choose a version with Python 3 and then install the core packages used in this book: [~]$ conda install numpy pandas scikit-learning matplotlib sea jumper Throughout the text we will also use other more specialized tools in python's scientific ecosystem; installation is usually as easy as typing conda install package name. For more information about conda, including information on creating and using conda environments (which I would highly recommend), see Conda's online documentation. Documentation.

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