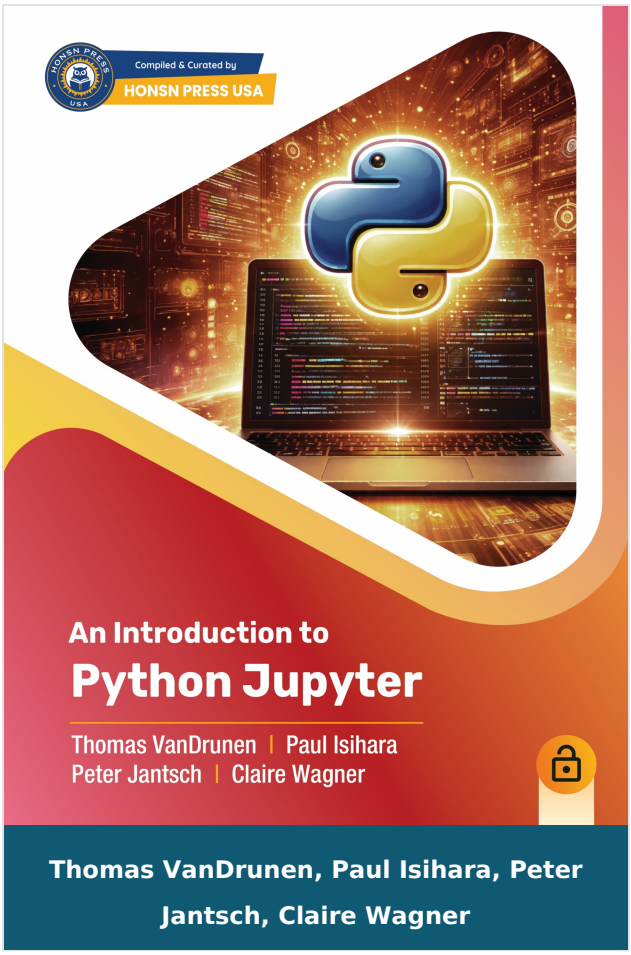

An Introduction to Python Jupyter (HONSN PRESS USA)

Author :	Thomas VanDrunen, Paul Isihara, Peter Jantsch, Claire Wagner
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Product Description

An Introduction to Python Jupyter Notebooks for College Math Teachers” is a comprehensive and evolving classroom resource designed to bridge the gap between theoretical collegiate mathematics and practical computational application. This text serves as an essential guide for college math teachers and their students seeking to seamlessly integrate the power of Python and Jupyter Notebooks (JNBs) into their curriculum. Unlike traditional textbooks, this entire work is presented in the form of modular Jupyter Notebooks, with each section structured for interactive engagement. This format allows for the direct input and execution of Python code alongside explanatory text, charts, and multimedia resources, making mathematical concepts immediately demonstrable and reproducible.

The book’s core theme is to enrich and enliven the study of mathematics using this cutting-edge tool. It offers immense practical value by covering a wide range of collegiate mathematics, from foundational Python programming and Exploratory Data Analysis (EDA) to advanced topics in Calculus, Linear Algebra, Statistical Inference, Differential Equations, and Complex Variables. Crucially, it connects these abstract concepts to complex real-world societal applications, such as modeling disease spread (COVID-19), analyzing urban data, and groundwater flow. Each chapter is designed to be read independently and includes dedicated JNB labs with solutions, providing a flexible framework for experienced educators to modify and tailor content to their specific courses, ultimately serving as a useful starting point to harness computational power for mathematical education.

Salient Features

- Interactive Learning Format: The entire book is written as modular Jupyter Notebooks, allowing for immediate, interactive execution of code alongside

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explanatory content, which is ideal for classroom use.

- Comprehensive Curricula Integration: The content seamlessly integrates Python programming with core college mathematics, including Calculus, Linear Algebra, Probability, and Statistical Inference for multiple course levels.
- Foundational Coding Guide: Provides a detailed Python Programming Guide, introducing essential concepts like data types, control flow, functions, and working with libraries such as NumPy and Pandas.
- Applied Data Science: Dedicated chapters on Exploratory Data Analysis (EDA) and Advanced Data Analysis provide hands-on experience in real-world data investigation and text classification using Python.
- Societal Modeling Applications: Features extensive application-based chapters, such as using Differential Equations to model public health issues (e.g., COVID-19) and Complex Variables for groundwater analysis.
- Practical Lab Exercises: Every chapter includes a dedicated Jupyter Notebook Lab and corresponding solutions, offering practical exercises that teachers can customize and students can use for independent practice.
- Optimization & Systems: Explores modern quantitative techniques like Linear Algebra for Optimization, K-means Clustering, and introduces the fundamental concepts of Complex Systems and Statistical Physics.

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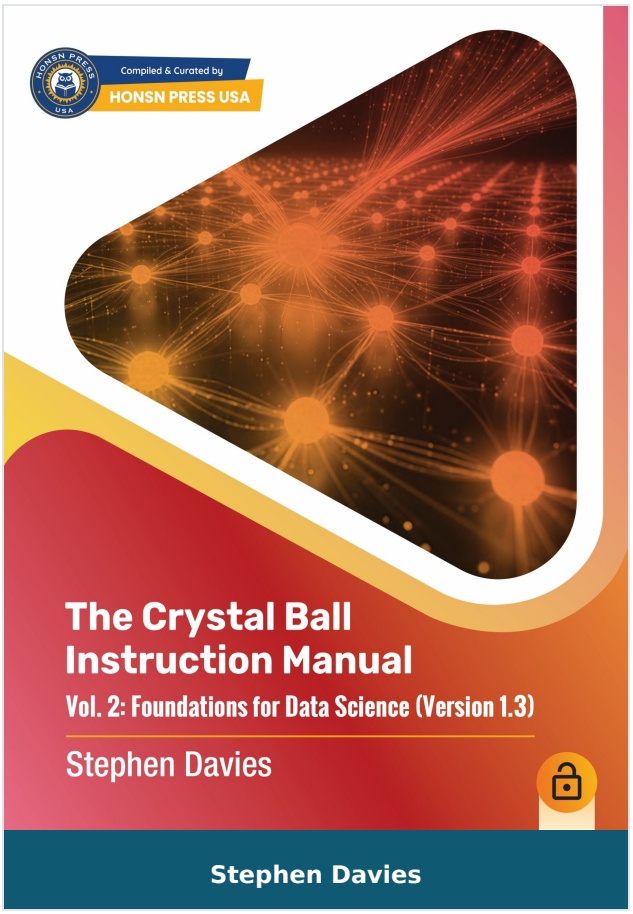

The Crystal Ball Instruction Manual (Vol.2: Foundations for Data Science, Verson 1.3) (HONSN PRESS USA)

Author :	Stephen Davies
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Product Description

The Crystal Ball Instruction Manual, Volume Two: Foundations for Data Science, is the essential next step for learners ready to move beyond introductory concepts and establish mastery in the field. Designed for intermediate students, aspiring professionals, and researchers who have a working knowledge of foundational Python programming, this volume solidifies the core knowledge and practical skills necessary to build a robust data science skill set. It assumes a base level of competency, offering a swift review of essential concepts like statistical significance, exploratory data analysis (EDA) fundamentals, and classification/regression principles.

The book's core theme is hands-on implementation, leveraging the Python ecosystem—including the Spyder IDE, NumPy, and Pandas—to tackle real-world data challenges. Its practical value is delivered through in-depth coverage of crucial data acquisition and wrangling techniques, such as parsing complex JSON and HTML using screen scraping, accessing databases, and data fusion to integrate multiple sources. It extends EDA with advanced visualization methods like heat maps and box plots, while simultaneously providing a solid grounding in machine learning principles like Naïve Bayes and kNN classification, along with essential pre-modeling steps like feature selection and association analysis.

Salient Features

• Foundational Data Principles: Reviews and solidifies core concepts like statistical significance, the crucial distinction between association and causality, and fundamental machine learning terminology.

• Advanced Data Exploration: Extends Exploratory Data Analysis (EDA) skills with detailed instruction on Kernel Density Estimates (KDEs), various distribution plots, and bivariate categorical analysis.

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• Real-World Data Acquisition: Provides practical techniques for collecting and structuring disparate data, including parsing complex JSON files, performing screen scraping (HTML), and directly accessing databases (SQLite).

• Effective Data Wrangling: Focuses on combining and restructuring data using techniques like data fusion, merging tables, and transforming datasets between long, wide, and the modern "tidy" form.

• Practical ML Algorithms: Delivers hands-on instruction for fundamental classification algorithms, including thorough multipart coverage of the Naïve Bayes classifier and the k-Nearest Neighbors (kNN) method.

• Statistical Modeling Insights: Covers probabilistic reasoning, the concepts of the prior and posterior, and the practical application of the LOWESS non-parametric local regression smoothing algorithm.

• Essential Pre-Modeling Techniques: Dedicated chapters explore critical preparatory steps such as feature selection to improve model performance and association analysis (like market basket analysis).

• Integrated Python Environment: Instructions are explicitly integrated with the Spyder IDE within the Anaconda distribution, ensuring seamless, hands-on application using industry-standard Python libraries.

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