Intro to Python® for Computer Science and Data Science
Learning to Program with AI, Big Data and the Cloud
by Paul Deitel & Harvey Deitel

PART 1
CS: Python Fundamentals Quickstart

CS 1. Introduction to Computers and Python

DS Intro: AI—at the Intersection of CS and DS

CS 2. Introduction to Python Programming

DS Intro: Basic Descriptive Stats

CS 3. Control Statements and Program Development

DS Intro: Measures of Central Tendency—Mean, Median, Mode

CS 4. Functions

DS Intro: Basic Statistics—Measures of Dispersion

CS 5. Lists and Tuples

DS Intro: Simulation and Static Visualization

PART 2
CS: Python Data Structures, Strings and Files

CS 6. Dictionaries and Sets

DS Intro: Simulation and Dynamic Visualization

CS 7. Array-Oriented Programming with NumPy
High-Performance NumPy Arrays

DS Intro: Pandas Series and DataFrames

CS 8. Strings: A Deeper Look
Includes Regular Expressions

DS Intro: Pandas, Regular Expressions and Data Wrangling

CS 9. Files and Exceptions

DS Intro: Loading Datasets from CSV Files into Pandas DataFrames

PART 3
CS: Python High-End Topics

CS 10. Object-Oriented Programming

DS Intro: Time Series and Simple Linear Regression

CS 11. Computer Science Thinking: Recursion, Searching, Sorting and Big O

CS and DS Other Topics Blog

PART 4
AI, Big Data and Cloud Case Studies

DS 12. Natural Language Processing (NLP)
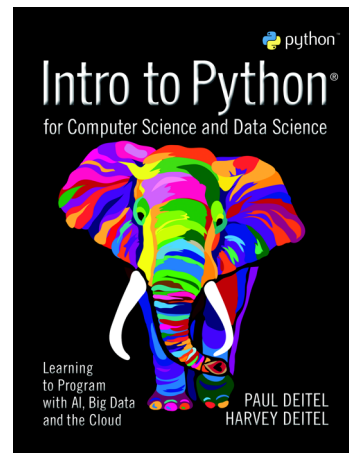Web Scraping in the Exercises

DS 13. Data Mining Twitter®
Sentiment Analysis, JSON and Web Services

DS 14. IBM Watson® and Cognitive Computing

DS 15. Machine Learning: Classification, Regression and Clustering

DS 16. Deep Learning
Convolutional and Recurrent Neural Networks; Reinforcement Learning in the Exercises

DS 17. Big Data: Hadoop®, Spark™, NoSQL and IoT

1. Chapters 1–11 marked **CS** are traditional **Python** programming and **computer-science** topics.
2. Light-tinted bottom boxes in Chapters 1–10 marked **DS Intro** are **brief, friendly introductions to data-science topics**.

3. Chapters 12–17 marked **DS** are **Python-based, AI, big data and cloud** chapters, each containing **several full-implementation studies**.
4. **Functional-style programming** is integrated book wide.

5. Preface explains the dependencies among the chapters.
6. **Visualizations** throughout.

7. **CS courses** may cover more of the Python chapters and less of the DS content. Vice versa for **Data Science courses**.
8. We put Chapter 5 in Part 1. It's also a natural fit with Part 2.

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