

### 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 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 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 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**

**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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