Python® Programming

Reviewer Comments

“Strikes a good balance between teaching computer science fundamentals and putting data science techniques into practice. Designed to help students not only learn programming fundamentals but also leverage the large number of existing libraries to start accomplishing tasks with minimal code. Concepts are accompanied by rich Python examples that students can adapt to implement their own solutions to data science problems. I like that cloud services are used.” —**David Koop, Assistant Professor, U-Mass Dartmouth**

“Fun, engaging real-world examples and exercises will encourage students to conduct meaningful data analyses. This book provides many of the best explanations of data science concepts I’ve encountered. Introduces the most useful starter machine learning models—does a good job explaining how to choose the best model and what “the best” means. Great overview of all the big data technologies with relevant examples.” —**Jamie Whitacre, Data Science Consultant**

“Great introduction to Python! This book has my strongest recommendation both as an introduction to Python as well as Data Science. A great introduction to IBM Watson and the services it provides!” —**Shyamal Mitra, Senior Lecturer, University of Texas**

“The best designed Intro to Data Science/Python book I have seen.” —**Roland DePratti, Central Connecticut State University**

“You’ll develop applications using industry standard libraries and cloud computing services.” —**Daniel Chen, Data Scientist, Lander Analytics**

“The book’s applied approach should engage students. The examples involving the top-down, stepwise refinement of programs illustrate how programs are really developed. A fantastic job providing background on various machine learning concepts without burdening the users with too many mathematical details.” —**Garrett Dancik, Associate Professor of Computer Science/Bioinformatics, Eastern Connecticut State University**

More Comments Inside the Back Cover

In this book, you’ll learn hands-on with today’s most compelling, leading-edge computing technologies—and, as you’ll see, with an easily tunable mix of computer science and data science appropriate for introductory courses in those and related disciplines. And, you’ll program in Python—one of the world’s most popular languages and the fastest growing among them. Please read the Table of Contents diagram inside the front cover and the Preface for more details:

- **538 hands-on, real-world, live-code examples** in snippets and case studies; **471 exercises and projects**.
- **Immediate feedback** with **IPython, Jupyter Notebooks** and **557 Self Check exercises**.
- **Library focused:** Use Python and data science libraries to accomplish significant tasks with minimal code.
- **Rich coverage of fundamentals:** Problem solving, algorithm development, control statements, functions.
- **Collections:** Lists, tuples, dictionaries, sets, NumPy arrays, pandas Series and pandas DataFrames.
- 2D and 3D static, dynamic and interactive **visualizations**.
- Strings, text files, JSON serialization, CSVs; exceptions.
- **Procedural/functional-style/object-oriented programming**.
- **Data experiences** with real-world datasets & data sources.
- **Intro to Data Science sections:** Basic stats, simulation, animation, random variables, data wrangling, regression.
- Privacy, security, ethics, reproducibility, transparency.
- **AI, big data and cloud data science case studies:** NLP, data mining Twitter, IBM Watson, machine learning, deep learning, computer vision, Hadoop, Spark, NoSQL, IoT.
- **Open-source libraries:** NumPy, pandas, Matplotlib, Seaborn, Folium, SciPy, NLTK, TextBlob, spaCy, Textatistic, Tweepy, Scikit-learn, Keras, PubNub and more.
- Communicate with the authors at **deitel@deitel.com**.

Pearson

www.pearson.com

ISBN-13: 978-0-13-540467-6
ISBN-10: 0-13-540467-3

9 780135 404676 90000

DEITEL®

Intro to Python® for Computer Science and Data Science

Pearson

python™

Intro to Python®

for Computer Science and Data Science

Learning to Program with AI, Big Data and the Cloud

PAUL DEITEL
HARVEY DEITEL

DIGITAL RESOURCES FOR STUDENTS

Your new textbook provides 12-month access to digital resources that may include VideoNotes (step-by-step video tutorials on programming concepts), source code, and more. Refer to the preface in the textbook for a detailed list of resources.

Follow the instructions below to register for the Companion Website for ***Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data and the Cloud*** by Paul Deitel and Harvey Deitel.

1. Go to **www.pearson.com/cs-resources**
2. Enter the title of your textbook or browse by author name.
3. Click Companion Website.
4. Click Register and follow the on-screen instructions to create a login name and password.

Use a coin to scratch off the coating and reveal your student access code.
Do not use a knife or other sharp object as it may damage the code.

Use the login name and password you created during registration to start using the digital resources that accompany your textbook.

IMPORTANT

This access code can only be used once. This subscription is valid for 12 months upon activation and is not transferable. If the access code has already been revealed it may no longer be valid. If this is the case you can purchase a subscription on the login page for the Companion Website.

For technical support go to **https://support.pearson.com/getsupport/**

REVIEWER COMMENTS

"Wonderful for first-time Python learners from all educational backgrounds and majors. My business analytics students had little to no coding experience when they began the course. In addition to loving the material, it was easy for them to follow along with the example exercises and by the end of the course were able to mine and analyze Twitter data using techniques learned from the book. The chapters are clearly written with detailed explanations of the example code, which makes it easy for students without a computer science background to understand. The modular structure, wide range of contemporary data science topics, and companion Jupyter notebooks make this a fantastic resource for instructors and students of a variety of Data Science, Business Analytics, and Computer Science courses. The "Self Checks" are great for students. Fabulous Big Data chapter—it covers all of the relevant programs and platforms. Great Watson chapter! This is the type of material that I look for as someone who teaches Business Analytics. The chapter provided a great overview of the Watson applications. Also, your translation examples are great for students because they provide an "instant reward"—it's very satisfying for students to implement a task and receive results so quickly. Machine Learning is a huge topic and this chapter serves as a great introduction. I loved the housing data example—very relevant for business analytics students. The chapter was visually stunning."
—Alison Sanchez, Assistant Professor in Economics, University of San Diego

"I like the new combination of topics from computer science, data science, and stats. A compelling feature is the integration of content that is typically considered in separate courses. This is important for building data science programs that are more than just cobbling together math and computer science courses. A book like this may help facilitate expanding our offerings and using Python as a bridge for computer and data science topics. For a data science program that focuses on a single language (mostly), I think Python is probably the way to go." **—Lance Bryant, Shippensburg University**

"The end-of-the-chapter problems are a real strength of this book (and of Deitel & Deitel books in general). I would likely use this book. The most compelling feature is that it could, theoretically, be used for both computer science and data science programs."
—Dr. Mark Pauley, University of Nebraska at Omaha

"I agree with the authors that CS curricula should include data science—the authors do an excellent job of combining programming and data science topics into an introductory text. The material is presented in digestible sections accompanied by engaging interactive examples. This book should appeal to both computer science students interested in high-level Python programming topics and data science applications, and to data science students who have little or no prior programming experience. Nearly all concepts are accompanied by a worked-out example. A comprehensive overview of object-oriented programming in Python—the use of graphics is sure to engage the reader. A great introduction to Big Data concepts, notably Hadoop, Spark, and IoT. The examples are extremely realistic and practical." **—Garrett Dancik, Eastern Connecticut State University**

"I can see students feeling really excited about playing with the animations. Covers some of the most modern Python syntax approaches and introduces community standards for style and documentation. The breadth of each chapter and modular design of this book ensure that instructors can select sections tailored to a variety of programming skill levels and domain knowledge. The sorting visualization program is neat. The machine learning chapter does a great job of walking people through the boilerplate code needed for ML in Python. The case studies accomplish this really well. The later examples are so visual. Many of the model evaluation tasks make for really good programming practice."
—Elizabeth Wickes, Lecturer, School of Information Sciences, University of Illinois at Urbana-Champaign

"An engaging, highly-accessible book that will foster curiosity and motivate beginning data scientists to develop essential foundations in Python programming, statistics, data manipulation, working with APIs, data visualization, machine learning, cloud computing, and more. Great walkthrough of the Twitter APIs—sentiment analysis piece is very useful. I've taken several classes that cover natural language processing and this is the first time the tools and concepts have been explained so clearly. I appreciate the discussion of serialization with JSON and pickling and when to use one or the other—with an emphasis on using JSON over pickle—good to know there's a better, safer way! Very clear and engaging coverage of recursion, searching, sorting, and especially Big O—several "Aha" moments. The sorting animation is illustrative, useful, and fun. I look forward to seeing the textbook in use by instructors, students, and aspiring data scientists very soon." **—Jamie Whitacre, Data Science Consultant**

(Continued on the Facing Page)