
Python For Computational Science And Engineering

Explorations in Computing

HT THINK LIKE A COMPUTER SCIEN

Programming for Computations - Python

Cambridge IGCSE® and O Level Computer Science Programming Book for Python

An introduction to Python for science and engineering

Computational Frameworks for Political and Social Research with Python

Learning Scientific Programming with Python

Introduction to Scientific Programming with Python

Discovering Computer Science

Applied Scientific Computing

Introduction to Python for Science and Engineering

Problem Solving with Python

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Computational Physics

Interdisciplinary Problems, Principles, and Python Programming
Discovering Computer Science
Classic Computer Science Problems in Python
Making Music with Computers
With Application to Understanding Data
Introduction to Computer Science Using Python
A Gentle Introduction to Python for Life Scientists
Python Programming and Numerical Methods
Field Guide to Research with Python
Interdisciplinary Problems, Principles, and Python Programming
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Introductory Computational Science
An Introduction to Computer Science and Python Programming
Computational Physics
Introduction to Computation and Programming Using Python, second edition

Mastering Python Scientific Computing
A Primer on Scientific Programming with Python
With Python
A Student's Guide to Python for Physical Modeling
Numerical Python

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ADKINS BRIGHT

Explorations in Computing CRC Press
Python® is a free open-source language and environment that has tremendous potential in the scientific computing domain. Computing with Python presents the programming language in tight connection with mathematical applications. The approach of the book is concept based rather than a systematic introduction to the language. It is written

for a mathematical readership and is aimed at students with a mathematical background.

HT THINK LIKE A COMPUTER SCIEN

Pearson Higher Ed

This book presents computer programming as a key method for solving mathematical problems. There are two versions of the book, one for MATLAB and one for Python. The book was inspired by the Springer book TCSE 6: A Primer on Scientific Programming with Python (by Langtangen), but the style is more accessible and concise, in

keeping with the needs of engineering students. The book outlines the shortest possible path from no previous experience with programming to a set of skills that allows the students to write simple programs for solving common mathematical problems with numerical methods in engineering and science courses. The emphasis is on generic algorithms, clean design of programs, use of functions, and automatic tests for verification.

Programming for Computations - Python
Apress

This book is suitable for use in a university-level first course in computing (CS1), as well as the increasingly popular course known as CS0. It is difficult for many students to master basic concepts in computer science and programming.

A large portion of the confusion can be blamed on the complexity of the tools and materials that are traditionally used to teach CS1 and CS2. This textbook was written with a single overarching goal: to present the core concepts of computer science as simply as possible without being simplistic.

**Cambridge IGCSE® and O Level
Computer Science Programming
Book for Python** CRC Press

Computational physics is a rapidly growing subfield of computational science, in large part because computers can solve previously intractable problems or simulate natural processes that do not have analytic solutions. The next step beyond Landau's First Course in Scientific Computing and a follow-up to Landau and Páez's Computational

Physics, this text presents a broad survey of key topics in computational physics for advanced undergraduates and beginning graduate students, including new discussions of visualization tools, wavelet analysis, molecular dynamics, and computational fluid dynamics. By treating science, applied mathematics, and computer science together, the book reveals how this knowledge base can be applied to a wider range of real-world problems than computational physics texts normally address. Designed for a one- or two-semester course, A Survey of Computational Physics will also interest anyone who wants a reference on or practical experience in the basics of computational physics. Accessible to advanced undergraduates Real-world

problem-solving approach Java codes and applets integrated with text Companion Web site includes videos of lectures

[An introduction to Python for science and engineering](#) Springer

"Havill's problem-driven approach introduces algorithmic concepts in context and motivates students with a wide range of interests and backgrounds." -- Janet Davis, Associate Professor and Microsoft Chair of Computer Science, Whitman College
"This book looks really great and takes exactly the approach I think should be used for a CS 1 course. I think it really fills a need in the textbook landscape." -- Marie desJardins, Dean of the College of Organizational, Computational, and Information Sciences, Simmons

University "Discovering Computer Science is a refreshing departure from introductory programming texts, offering students a much more sincere introduction to the breadth and complexity of this ever-growing field." -- James Deverick, Senior Lecturer, The College of William and Mary "This unique introduction to the science of computing guides students through broad and universal approaches to problem solving in a variety of contexts and their ultimate implementation as computer programs." -- Daniel Kaplan, DeWitt Wallace Professor, Macalester College

Discovering Computer Science: Interdisciplinary Problems, Principles, and Python Programming is a problem-oriented introduction to computational problem solving and programming in

Python, appropriate for a first course for computer science majors, a more targeted disciplinary computing course or, at a slower pace, any introductory computer science course for a general audience. Realizing that an organization around language features only resonates with a narrow audience, this textbook instead connects programming to students' prior interests using a range of authentic problems from the natural and social sciences and the digital humanities. The presentation begins with an introduction to the problem-solving process, contextualizing programming as an essential component. Then, as the book progresses, each chapter guides students through solutions to increasingly complex problems, using a

spiral approach to introduce Python language features. The text also places programming in the context of fundamental computer science principles, such as abstraction, efficiency, testing, and algorithmic techniques, offering glimpses of topics that are traditionally put off until later courses. This book contains 30 well-developed independent projects that encourage students to explore questions across disciplinary boundaries, over 750 homework exercises, and 300 integrated reflection questions engage students in problem solving and active reading. The accompanying website — <https://www.discoveringcs.net> — includes more advanced content, solutions to selected exercises, sample code and data files, and pointers for

further exploration.

Computational Frameworks for Political and Social Research with Python

CreateSpace

The goal of this book is to teach you to think like a computer scientist. This way of thinking combines some of the best features of mathematics, engineering, and natural science. Like mathematicians, computer scientists use formal languages to denote ideas (specifically computations). Like engineers, they design things, assembling components into systems and evaluating tradeoffs among alternatives. Like scientists, they observe the behavior of complex systems, form hypotheses, and test predictions. The single most important skill for a computer scientist is problem

solving. Problem solving means the ability to formulate problems, think creatively about solutions, and express a solution clearly and accurately. As it turns out, the process of learning to program is an excellent opportunity to practice problem-solving skills. That's why this chapter is called, The way of the program. On one level, you will be learning to program, a useful skill by itself. On another level, you will use programming as a means to an end. As we go along, that end will become clearer.

Learning Scientific Programming with Python Packt Publishing Ltd

This easy-to-understand textbook presents a modern approach to learning numerical methods (or scientific computing), with a unique focus on the

modeling and applications of the mathematical content. Emphasis is placed on the need for, and methods of, scientific computing for a range of different types of problems, supplying the evidence and justification to motivate the reader. Practical guidance on coding the methods is also provided, through simple-to-follow examples using Python. Topics and features: provides an accessible and applications-oriented approach, supported by working Python code for many of the methods; encourages both problem- and project-based learning through extensive examples, exercises, and projects drawn from practical applications; introduces the main concepts in modeling, python programming, number representation, and errors; explains the essential details

of numerical calculus, linear, and nonlinear equations, including the multivariable Newton method; discusses interpolation and the numerical solution of differential equations, covering polynomial interpolation, splines, and the Euler, Runge-Kutta, and shooting methods; presents largely self-contained chapters, arranged in a logical order suitable for an introductory course on scientific computing. Undergraduate students embarking on a first course on numerical methods or scientific computing will find this textbook to be an invaluable guide to the field, and to the application of these methods across such varied disciplines as computer science, engineering, mathematics, economics, the physical sciences, and social science.

Introduction to Scientific Programming with Python Cambridge University Press
Treat yourself to a lively, intuitive, and easy-to-follow introduction to computer programming in Python. The book was written specifically for biologists with little or no prior experience of writing code - with the goal of giving them not only a foundation in Python programming, but also the confidence and inspiration to start using Python in their own research. Virtually all of the examples in the book are drawn from across a wide spectrum of life science research, from simple biochemical calculations and sequence analysis, to modeling the dynamic interactions of genes and proteins in cells, or the drift of genes in an evolving population. Best of all, Python for the Life Sciences shows

you how to implement all of these projects in Python, one of the most popular programming languages for scientific computing. If you are a life scientist interested in learning Python to jump-start your research, this is the book for you. What You'll Learn Write Python scripts to automate your lab calculations Search for important motifs in genome sequences Use object-oriented programming with Python Study mining interaction network data for patterns Review dynamic modeling of biochemical switches Who This Book Is For Life scientists with little or no programming experience, including undergraduate and graduate students, postdoctoral researchers in academia and industry, medical professionals, and teachers/lecturers. "A comprehensive

introduction to using Python for computational biology... A lovely book with humor and perspective" -- John Novembre, Associate Professor of Human Genetics, University of Chicago and MacArthur Fellow "Fun, entertaining, witty and darn useful. A magical portal to the big data revolution" -- Sandro Santagata, Assistant Professor in Pathology, Harvard Medical School "Alex and Gordon's enthusiasm for Python is contagious" -- Glenys Thomson Professor of Integrative Biology, University of California, Berkeley
[Discovering Computer Science Springer](#)
 An Active Learning Approach to Teaching the Main Ideas in Computing
 Explorations in Computing: An Introduction to Computer Science and Python Programming teaches computer

science students how to use programming skills to explore fundamental concepts and computational approaches to solving problems. Tbook gives beginning students an introduction to *Applied Scientific Computing* Packt Publishing Ltd

More physicists today are taking on the role of software developer as part of their research, but software development isn't always easy or obvious, even for physicists. This practical book teaches essential software development skills to help you automate and accomplish nearly any aspect of research in a physics-based field. Written by two PhDs in nuclear engineering, this book includes practical examples drawn from a working

knowledge of physics concepts. You'll learn how to use the Python programming language to perform everything from collecting and analyzing data to building software and publishing your results. In four parts, this book includes: Getting Started: Jump into Python, the command line, data containers, functions, flow control and logic, and classes and objects Getting It Done: Learn about regular expressions, analysis and visualization, NumPy, storing data in files and HDF5, important data structures in physics, computing in parallel, and deploying software Getting It Right: Build pipelines and software, learn to use local and remote version control, and debug and test your code Getting It Out There: Document your code, process and publish your findings,

and collaborate efficiently; dive into software licenses, ownership, and copyright procedures

Introduction to Python for Science and Engineering Princeton University Press

The book provides an introduction to common programming tools and methods in numerical mathematics and scientific computing. Unlike widely used standard approaches, it does not focus on any particular language but aims to explain the key underlying concepts. In general, new concepts are first introduced in the particularly user-friendly Python language and then transferred and expanded in various scientific programming environments from C / C ++, Julia and MATLAB to Maple. This includes different approaches to distributed computing.

The fact that different languages are studied and compared also makes the book useful for mathematicians and practitioners trying to decide which programming language to use for which purposes.

Problem Solving with Python Springer Science & Business Media

Introduction to Computational Models with Python explains how to implement computational models using the flexible and easy-to-use Python programming language. The book uses the Python programming language interpreter and several packages from the huge Python Library that improve the performance of numerical computing, such as the Numpy and Scipy m

Python for Scientists CRC Press
Discovering Computer Science:

Interdisciplinary Problems, Principles, and Python Programming introduces computational problem solving as a vehicle of discovery in a wide variety of disciplines. With a principles-oriented introduction to computational thinking, the text provides a broader and deeper introduction to computer science than typical introductory programming books. Organized around interdisciplinary problem domains, rather than programming language features, each chapter guides students through increasingly sophisticated algorithmic and programming techniques. The author uses a spiral approach to introduce Python language features in increasingly complex contexts as the book progresses. The text places programming in the context of

fundamental computer science principles, such as abstraction, efficiency, and algorithmic techniques, and offers overviews of fundamental topics that are traditionally put off until later courses. The book includes thirty well-developed independent projects that encourage students to explore questions across disciplinary boundaries. Each is motivated by a problem that students can investigate by developing algorithms and implementing them as Python programs. The book's accompanying website — <http://discoverCS.denison.edu> — includes sample code and data files, pointers for further exploration, errata, and links to Python language references. Containing over 600 homework exercises and over 300 integrated

reflection questions, this textbook is appropriate for a first computer science course for computer science majors, an introductory scientific computing course or, at a slower pace, any introductory computer science course.

Python for the Life Sciences CRC Press

An example-rich, comprehensive guide for all of your Python computational needs
 About This Book* Your ultimate resource for getting up and running with Python numerical computations* Explore numerical computing and mathematical libraries using Python 3.x code with SciPy and NumPy modules* A hands-on guide to implementing mathematics with Python, with complete coverage of all the key concepts
 Who This Book Is For
 This book is for anyone who wants to

perform numerical and mathematical computations in Python. It is especially useful for developers, students, and anyone who wants to use Python for computation. Readers are expected to possess basic a knowledge of scientific computing and mathematics, but no prior experience with Python is needed.
 What you will learn* The principal syntactical elements of Python* The most important and basic types in Python* The essential building blocks of computational mathematics, linear algebra, and related Python objects* Plot in Python using matplotlib to create high quality figures and graphics to draw and visualize your results* Define and use functions and learn to treat them as objects* How and when to correctly apply object-oriented programming for

scientific computing in Python* Handle exceptions, which are an important part of writing reliable and usable code* Two aspects of testing for scientific programming: Manual and Automatic
DetailPython can be used for more than just general-purpose programming. It is a free, open source language and environment that has tremendous potential for use within the domain of scientific computing. This book presents Python in tight connection with mathematical applications and demonstrates how to use various concepts in Python for computing purposes, including examples with the latest version of Python 3. Python is an effective tool to use when coupling scientific computing and mathematics and this book will teach you how to use

it for linear algebra, arrays, plotting, iterating, functions, polynomials, and much more.

Computational Physics Cambridge University Press

Scientific Python is a significant public domain alternative to expensive proprietary software packages. This book teaches from scratch everything the working scientist needs to know using copious, downloadable, useful and adaptable code snippets. Readers will discover how easy it is to implement and test non-trivial mathematical algorithms and will be guided through the many freely available add-on modules. A range of examples, relevant to many different fields, illustrate the language's capabilities. The author also shows how to use pre-existing legacy code (usually

in Fortran77) within the Python environment, thus avoiding the need to master the original code. In this new edition, several chapters have been rewritten to reflect the IPython notebook style. With an extended index, an entirely new chapter discussing SymPy and a substantial increase in the number of code snippets, researchers and research students will be able to quickly acquire all the skills needed for using Python effectively.

Interdisciplinary Problems, Principles, and Python Programming Python Scripting for Computational Science "For intermediate Python programmers"-Back cover.

Discovering Computer Science Springer This guide offers a rapid introduction to Python programming to anyone with no

experience in programming, taking a careful and methodical approach to presenting the features available and their use for performing practical scientific and engineering tasks.

Classic Computer Science Problems in Python Academic Press

Leverage this example-packed, comprehensive guide for all your Python computational needs Key Features: Learn the first steps within Python to highly specialized concepts Explore examples and code snippets taken from typical programming situations within scientific computing. Delve into essential computer science concepts like iterating, object-oriented programming, testing, and MPI presented in strong connection to applications within scientific computing. Book Description: Python has

tremendous potential within the scientific computing domain. This updated edition of Scientific Computing with Python features new chapters on graphical user interfaces, efficient data processing, and parallel computing to help you perform mathematical and scientific computing efficiently using Python. This book will help you to explore new Python syntax features and create different models using scientific computing principles. The book presents Python alongside mathematical applications and demonstrates how to apply Python concepts in computing with the help of examples involving Python 3.8. You'll use pandas for basic data analysis to understand the modern needs of scientific computing, and cover data module improvements and built-in

features. You'll also explore numerical computation modules such as NumPy and SciPy, which enable fast access to highly efficient numerical algorithms. By learning to use the plotting module Matplotlib, you will be able to represent your computational results in talks and publications. A special chapter is devoted to SymPy, a tool for bridging symbolic and numerical computations. By the end of this Python book, you'll have gained a solid understanding of task automation and how to implement and test mathematical algorithms within the realm of scientific computing. What You Will Learn: Understand the building blocks of computational mathematics, linear algebra, and related Python objects Use Matplotlib to create high-quality figures and graphics to draw and

visualize results Apply object-oriented programming (OOP) to scientific computing in Python Discover how to use pandas to enter the world of data processing Handle exceptions for writing reliable and usable code Cover manual and automatic aspects of testing for scientific programming Get to grips with parallel computing to increase computation speed Who this book is for: This book is for students with a mathematical background, university teachers designing modern courses in programming, data scientists, researchers, developers, and anyone who wants to perform scientific computation in Python.

Making Music with Computers Manning Publications

This fast-paced introduction to Python

moves from the basics to advanced concepts, enabling readers to gain proficiency quickly.

With Application to Understanding Data

Simon and Schuster

Python Programming and Numerical Methods: A Guide for Engineers and Scientists introduces programming tools and numerical methods to engineering and science students, with the goal of helping the students to develop good computational problem-solving techniques through the use of numerical methods and the Python programming language. Part One introduces fundamental programming concepts, using simple examples to put new concepts quickly into practice. Part Two covers the fundamentals of algorithms and numerical analysis at a level that

allows students to quickly apply results in practical settings. Includes tips, warnings and "try this" features within each chapter to help the reader develop good programming practice Summaries

at the end of each chapter allow for quick access to important information Includes code in Jupyter notebook format that can be directly run online

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