

Numerical Recipes in C++

The Art of Scientific Computing
Second Edition

William H. Press

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Preface to the C++ Edition

C++ has gradually become the dominant language for computer programming, displacing C and Fortran even in many scientific and engineering applications. This version of *Numerical Recipes* contains the entire text of the Second Edition with all the programs presented in C++.

C++ poses special problems for numerical work. In particular, it is difficult to treat vectors and matrices in a manner that is simultaneously efficient and yet allows programming with high-level constructs. The fact that there is still no universally accepted standard library for doing this makes the problem even more difficult for authors of a book like this one. In Chapter 1 and the Appendices we describe how we have solved this problem. The default option is for you, the reader, to use a very simple class library that we provide. You can be up and running in a few minutes. We also show you how you can alternatively use any other matrix/vector class library of your choosing. This may take you a few minutes to set up the first time, but thereafter will provide transparent access to the Recipes with essentially no loss in efficiency.

We have taken this opportunity to respond to a clear consensus from our C readers, and converted all arrays and matrices to be “zero-based.” We have also taken this opportunity to fix errors in the text and programs that have been reported to us by our readers. There are too many people to acknowledge individually, but to all who have written to us we are very grateful.

September 2001

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Brian P. Flannery

Numerical Recipes is the generic title of a series of books on algorithms and numerical analysis by William H. Press, Saul A. Teukolsky, William T. Vetterling and Brian P. Flannery. In various editions, the books have been in print since 1986. The most recent edition was published in 2007. In 2015 Numerical Recipes sold its historic two-letter domain name nr.com[1] and became numerical.recipes instead.

Contents. 1 Overview. The Numerical Recipes books cover a range of topics that include both classical numerical analysis (interpolation, integration, linear algebra, differential equations, and so on), signal processing (Fourier methods, filtering), statistical treatment of data, and a few topics in machine learning (hidden Markov model, support vector machines). Numerical Recipes: The Art of Scientific Computing: by W.H. Press, B. P. Flannery, S.A. Teukolsky, and W.T. Vetterling, 1986, Cambridge University Press. 818 p. \$39.50. Also available: Numerical Recipes in C\$44.95. Numerical Recipes FORTRAN Diskette \$19.95, Numerical Recipes Pascal Diskette \$19.95, Numerical Recipes Example Book (FORTRAN) \$18.95. Numerical Recipes Example Book (Pascal) \$18.95. Numerical Recipes Example Diskette (FORTRAN) \$19.95, Numerical Recipes Example Diskette (Pascal) \$19.95

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