

Computational Discrete Mathematics

Combinatorica, an extension to the popular computer algebra system *Mathematica*[®], is the most comprehensive software available for educational and research applications of discrete mathematics, particularly combinatorics and graph theory. This book is the definitive reference/user's guide to *Combinatorica*, with examples of all 450 *Combinatorica* functions in action, along with the associated mathematical and algorithmic theory. The authors cover classical and advanced topics on the most important combinatorial objects: permutations, subsets, partitions, and Young tableaux, as well as all important areas of graph theory: graph construction operations, invariants, embeddings, and algorithmic graph theory.

In addition to being a research tool, *Combinatorica* makes discrete mathematics accessible in new and exciting ways, by encouraging computational experimentation and visualization. The book is suitable for self-study and as a primary or supplementary textbook for discrete mathematics courses.

Sriram Pemmaraju is Professor of Computer Science at The University of Iowa. His research interests are in discrete mathematics, graph algorithms, and distributed computing.

Steven Skiena is Professor of Computer Science at SUNY Stony Brook. He is also the author of *The Algorithm Design Manual*; *Calculated Bets: Computers, Gambling, and Mathematical Modeling to Win*; and *Programming Challenges: The Programming Contest Training Manual*.

Computational Discrete Mathematics

Combinatorics and Graph Theory with *Mathematica*

SRIRAM PEMMARAJU

The University of Iowa

STEVEN SKIENA

SUNY at Stony Brook



CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press
40 West 20th Street, New York, NY 10011-4211, USA
www.cambridge.org
Information on this title: www.cambridge.org/9780521806862

© Cambridge University Press 2003

This publication is in copyright. Subject to statutory exception
and to the provisions of relevant collective licensing agreements,
no reproduction of any part may take place without
the written permission of Cambridge University Press.

First published 2003
Reprinted 2006

Printed in the United States of America

A catalogue record for this book is available from the British Library.

Library of Congress Cataloguing in Publication data

Pemmaraju, Sriram V., 1966—

Computational discrete mathematics : combinatorics and graph theory with Mathematica / Sriram Pemmaraju, Steven S. Skiena.
p. cm.

Includes bibliographical references and index.

ISBN 0-521-80686-0

1. Combinatorica (Computer file) 2. Combinatorial analysis — Data processing. 3. Graph theory — Data processing.

I. Skiena, Steven S. II. Title.

QA164.P45 2003

511'.6—dc21 2002041688

ISBN-13 978-0-521-80686-2 hardback

ISBN-10 0-521-80686-0 hardback

Cambridge University Press has no responsibility for
the persistence or accuracy of URLs for external or
third-party Internet Web sites referred to in this publication
and does not guarantee that any content on such
Web sites is, or will remain, accurate or appropriate.