

SECOND EDITION

EXPLORING BIOINFORMATICS

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A PROJECT-BASED APPROACH

An Engaging, Hands-On Approach to a Rapidly Growing Field

Thoroughly revised and updated, *Exploring Bioinformatics: A Project-Based Approach, Second Edition* is intended for an introductory course in bioinformatics at the undergraduate level. Through hands-on projects, students are introduced to current biological problems to explore and develop bioinformatic solutions to these issues. Each chapter presents a key problem, provides basic biological concepts, introduces computational techniques to address the problem, and guides students through the use of existing web-based tools and software solutions. This progression prepares students to tackle the On Your Own Project, for which they develop their own software solutions. Topics such as antibiotic resistance, genetic disease, and genome sequencing provide context and relevance to capture student interest. With a focus on developing problem-solving skills, the *Second Edition of Exploring Bioinformatics: A Project-Based Approach* is a contemporary and comprehensive introduction to this rapidly growing field.

NEW and KEY FEATURES of the updated *Second Edition*

- Project-based approach to bioinformatics gets students engaged in using bioinformatics techniques to approach genuine biological problems using both existing web-based tools and (in programming courses) their own computational solutions.
- Offers a flexible approach to understanding key bioinformatics algorithms with exercises that can be used with or without programming.
- Contains real-world problems to make learning the material engaging and relevant to readers.
- For programming courses, pseudocode allows students to implement algorithms in any desired programming language.
- Includes more substantive web-based projects for a more comprehensive, hands-on introduction to bioinformatics in non-programming courses.
- Contains updated material reflecting changes in how bioinformatics is used: next-generation sequencing, metagenomic analysis, statistical methods, etc.
- Contains more instructive and relevant case studies as well as more cohesive connections between the case studies and the exercises.

Teaching and Learning Resources

- Every new printed copy includes an access code to the Navigate Companion Website where students will find links to all the tools used in the text, sequences and test data for the projects, unique learning tools to help understand concepts, and programming syntax guides for PERL and Python.
- For instructors, the Navigate Companion Website includes secure download of complete programming solutions for every programming exercise in PERL and Python as well as keys for the web-based projects and other exercises in the text.



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