

*Sixth Edition*

**Be Prepared**  
for the

**AP**

**Computer  
Science  
Exam in Java**

**Maria Litvin**

Phillips Academy, Andover, Massachusetts

**Gary Litvin**

Skylight Publishing, Andover, Massachusetts

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Andover, Massachusetts

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Skylight Publishing  
9 Bartlet Street, Suite 70  
Andover, MA 01810

web: [www.skylit.com](http://www.skylit.com)  
e-mail: [sales@skylit.com](mailto:sales@skylit.com)  
[support@skylit.com](mailto:support@skylit.com)

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## Preface to the Sixth Edition

The College Board’s AP CS Development Committee has decided to abolish case studies, starting with the 2015 AP exam. In recent years, students had to practice extensively with the GridWorld case study, because five multiple-choice questions and one free-response exam question were based on the case study. Not any more! In this edition we have eliminated the references to GridWorld and updated the practice exams, eliminating the GridWorld questions.

The College Board expects a typical AP CS course to have a lab component. The Development Committee has made available three sample labs to demonstrate the extent of lab work expected. These specific labs are samples only; they will not be tested on the AP exam.

After solving the free-response questions in our practice exams with pencil and paper, students can continue working on them, individually or in groups, in a lab setting. We have included suggestions for labs based on the free-response questions and provide Java code for easy setup. Complete solutions to the labs are available to teachers.

## Preface

The AP exam in computer science tests your understanding of basic concepts in computer science as well as your fluency in Java programming. The exam covers roughly the material of a one-semester introductory college course in computer science (CS-1). In the past, the College Board offered two computer science exams, called “A” and more advanced “AB.” Starting in 2010, the College Board offers only one exam (still called “A”).

Exam questions are developed by The College Board’s AP Computer Science Development Committee, and exams are administered by the Educational Testing Service (ETS). The College Board currently offers exams in 34 subjects. In 2013, 2,218,578 students took 3,938,100 exams. The most up-to-date information on the AP exams offered and participation statistics can be found on The College Board’s web site <http://research.collegeboard.org/programs/ap/data>.

In the spring of 2004, the computer science exams used Java for the first time. At the same time, the AP CS program’s emphasis shifted from implementation of algorithms and coding proficiency to object-oriented software design and development. More recent exams, however, show some renewed interest in algorithms.

**Answers to exam questions written in a programming language other than Java or in pseudocode will not receive credit.**

A working knowledge of Java is necessary but not sufficient for a good grade on the exam. First and foremost, you must understand the basic concepts of computer science, object-oriented programming (OOP), and some common algorithms. As for Java: you don't have to know the whole language, just the subset described in The College Board's *Computer Science A Course Description* ([www.collegeboard.com/student/testing/ap/sub\\_compscia.html](http://www.collegeboard.com/student/testing/ap/sub_compscia.html)).

This is a lot of material to cover, and it is certainly not the goal of this book to teach you everything you need to know from scratch. For that, you need a complete textbook with exercises and programming projects. Most students who take the exam are enrolled in an AP Computer Science course at their school. A determined student can prepare for the exam on his or her own; it may take anywhere between two and twelve months, and a good textbook will be even more important.

The goals of this book are:

- to describe the exam format and requirements
- to describe the AP Java subset
- to provide an effective review of what you should know with emphasis on the more difficult topics and on common omissions and mistakes
- to help you identify and fill the gaps in your knowledge
- to offer sample exam questions with answers, hints, and solutions for you to practice with and analyze your mistakes

The AP exam in computer science is a paper-and-pencil affair. While you need a computer with a Java compiler to learn how to program and how to implement common algorithms in Java, this book does not require the use of a computer. In fact, it is a good idea not to use one when you work on practice questions, so that you can get used to the exam's format and environment. One-hundred-percent correct Java syntax is not the emphasis here. Small mistakes (a missed semicolon or a brace) that a compiler would normally help you catch will probably not affect your exam score. You'll need a computer only to access [collegeboard.com](http://collegeboard.com) and our web site, [www.skylit.com/beprepared](http://www.skylit.com/beprepared) for the latest updates and our solutions to the free-response questions from past exams.

Chapter 1 of this book explains the format, required materials, and the Java subset for the exam and provides information about exam grading and exam-taking hints. Chapter 2 and Chapter 3 cover the elements of Java required for the exam. Chapter 4 deals with OOP topics. Chapter 5 reviews common algorithms for searching and sorting. All review chapters contain sample multiple-choice questions with detailed explanations of all the right and wrong answers. Chapter 6 is actually on the web at this book's companion web site, [www.skylit.com/beprepared/](http://www.skylit.com/beprepared/). It offers our annotated solutions to the free-response questions from past exams. At the end of the book are five complete practice exams followed by answers and solutions.



Our colleague and friend Dave Wittry passed away in a tragic accident while training for a triathlon, on February 5, 2008. He was 41. Dave contributed practice exam questions for the second and third editions of this book. Dave taught at Troy High School, a magnet school for science, math, and technology in Fullerton, California, and contributed to Troy's immense success in Computer Science. In 2005 Dave moved to Taiwan and taught AP Computer Science and mathematics at the Taipei American School. He was a Reader for the AP Computer Science Exams for several years. Dave was always ready to help friends, students, and colleagues, and he developed valuable resources for computer science teachers. We miss Dave!



We are grateful to David Levine of St. Bonaventure University who recommended many important improvements, helped us catch technical and stylistic mistakes, and pointed out questions that needed clarification in the first edition of *Be Prepared*, which came out in 1999.

Roger Frank and Judy Hromcik contributed practice questions to the second and third editions; some of the questions in this book are based on their ideas. Roger also went very thoroughly over the draft of the earlier editions and recommended many corrections and improvements.

We thank teachers and students who alerted us to several mistakes in the earlier editions of this book.

Our special thanks to Margaret Litvin for making this book more readable with her thorough and thoughtful editing.

Finally, we thank the Boy Scouts of America for allowing us to allude to their motto in the book's title.

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