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To

My mother
Saraswathi Sunderraman
for her love and hard work

My father
Sq. Ldr. Rajagopala Sunderraman
for his love and encouragement

My wife
Radhika
for her love and caring

My children
Nandita and Naveen
for their love and innocence
Oracle is the most widely used database system in the world. It runs on virtually all platforms—from the personal computer to the mainframe. It also comes with an array of programming tools and environments and provides access to any database from a variety of high-level programming languages.

In recent years, more and more universities are using Oracle in their database courses as the primary vehicle to illustrate database concepts and principles. This has generated a need for a concise book on Oracle programming to supplement the traditional texts used in database courses. The main motivation for writing this book has been to satisfy this need. This book can also be used in a nonacademic setting by professionals interested in learning about SQL, PL/SQL, embedded SQL programming, and JDBC in the context of Oracle.

The topics discussed in this book are Oracle SQL, PL/SQL, embedded programming with Pro*C and JDBC. To work with Oracle, it is absolutely essential to learn about SQL and PL/SQL, the two languages at the core of the Oracle database engine. Embedded SQL (Pro*C) and JDBC access to Oracle are two of the important environments in which to develop applications. Java is an emerging language that will have a significant impact in computing in the coming years, and Oracle is investing in this technology by providing JDBC drivers and other tools to develop applications, especially on the Web. Embedded SQL is part of the SQL standards and is also an important technique for database programmers to learn.
Two sample databases are introduced early in the book and are used for illustration purposes in most of the chapters. Several application programs are developed in their entirety in the different programming environments discussed in the text.¹

Using This Book

This book is suitable as a supplemental text for an introductory database course that covers the relational model and uses Oracle as the database system for the course projects and assignments. Course projects can be developed using embedded SQL (Pro*C) or JDBC. An entire chapter is devoted to suggestions for course projects. Such projects are typically assigned in introductory database courses where a team of students start with a problem statement, write the problem specifications, design the database, create the database in Oracle, and write application programs that access the database. Some of the chapters also have review exercises that will help readers consolidate their understanding of the concepts presented in the chapter.

This book is also appropriate for nonacademic individuals who are interested in learning about Oracle. They can find materials on SQL, PL/SQL, Pro*C, and JDBC, all in one text. This book can be considered a starting point in the exploration of what Oracle has to offer.

World Wide Web Support

Most of the code presented in the book can also be found at the following World Wide Web site:

http://www.awl.com/cseng/titles/0-201-35753-4

In addition, the author will attempt to include other related materials to be developed in the near future at this site.

¹. The programs and the applications presented in this book have been included for their instructional value. They have been tested with care but are not guaranteed for any particular purpose. The publisher does not offer any warranties or representations, nor does it accept any liabilities with respect to the programs or applications.
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This programming companion from Rajshekhar Sunderraman is a streamlined approach to Oracle SQL, the most prevalent database language in industry and on campus today. The book focuses on the most up-to-date aspects of Oracle and is designed as a detailed guide for new users of this application. Students will be able to use this primer to complete projects in a number of different programming environments (PRO*C, PL/SQL, and Oracle JDBC), thereby giving instructors flexibility and choice in assignments.

**Highlights**

- Devotes separate chapters to JDBC (in the context of Oracle) and embedded SQL (PRO*C)
- Includes an extensive selection of problems and project suggestions
- Provides users with the ability to bring to life the programming projects and sample databases presented in Elmasri/Navathe, *Fundamentals of Database Systems*, Second Edition

**About the Author**

Rajshekhar Sunderraman is an assistant professor of mathematics and computer science at Georgia State University in Atlanta. Professor Sunderraman received his Ph.D. in computer science from Iowa State University and has been teaching computer science for more than 10 years. He has published numerous articles on a wide range of topics, including inconsistencies in relational databases, negation in deductive databases, and declarative specification of objects in object-oriented databases.