

OCP

Oracle8i

SQL & PL/SQL 考试  
学习指南  
(英文版)

Oracle8i  
Certified Professional SQL  
and PL/SQL Exam Guide

Oracle Press® 授权出版



(美) Jason S. Couchman 著



机械工业出版社  
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Certified Professional

### **About the Oracle Certification Exams**

The expertise of Oracle database administrators (DBAs) is integral to the success of today's increasingly complex system environments. The best DBAs operate primarily behind the scenes, looking for ways to fine-tune day-to-day performance to prevent unscheduled crises and hours of expensive downtime. They know they stand between optimal performance and a crisis that could bring a company to a standstill. The Oracle Certified Database Administrator Track provides DBAs with tangible evidence of their skills with the Oracle database.

The Oracle Certified Professional (OCP) Program was developed by Oracle to recognize technical professionals who can demonstrate the depth of knowledge and hands-on skills required to maximize Oracle's core products according to a rigorous standard established by Oracle. By earning professional certification, you can translate the impressive knowledge and skill you have worked so hard to accumulate into a tangible credential that can lead to greater job security or more challenging, better-paying opportunities.

Oracle Certified Professionals are eligible to receive use of the Oracle Certified Professional logo and a certificate for framing.

### **Requirements for Certification**

To become an Oracle Certified Database Administrator, you must pass five tests. These exams cover knowledge of the essential aspects of the SQL language, Oracle administration, backup and recovery, and performance tuning of systems. The certification process requires that you pass the following five exams:

- Exam 1: Introduction to Oracle-SQL and PL/SQL (1Z0-001)
- Exam 2: Oracle8i Architecture and Administration (1Z0-023)
- Exam 3: Oracle8i Backup and Recovery (1Z0-025)
- Exam 4: Oracle8i Performance Tuning (1Z0-024)
- Exam 5: Oracle8i Network Administration (1Z0-026)

If you fail a test, you must wait at least 30 days before you retake that exam. You may attempt a particular test up to three times in a twelve-month period.

## **Recertification**

Oracle announces the requirements for upgrading your certification based on the release of new products and upgrades. Oracle will give six months advance notice when an exam version is due to expire.

## **Exam Format**

The computer-based exams are multiple-choice tests, consisting of 60–90 questions that must be completed in 90 minutes.

## **20% OCP Exam Discount Offer**

You can receive a 20% exam discount when you register for a FREE membership to Oracle Technology Network (OTN) at <http://technet.oracle.com/membership>.

OTN is your definitive source for Oracle technical information. As a member, you will be part of an online community with access to:

- Oracle Certified Professional (OCP) discounts and training offers
- Free software downloads
- OTN sponsored eSeminars and conferences
- Discussion forums on key technology topics

# Preface



My interest in Oracle certification began in 1996 when I read about the Oracle DBA certificate offered by the Chauncey Group. I found it difficult to prepare for that certification exam for two reasons. First, there was an absence of practice questions readily available.

Second, preparation for the exam involved reviewing six or seven different manuals and Oracle Press books, none of which were particularly suited to the task. Judging from the response to the proliferation of titles now available in the OCP Exam Guide Series from Oracle Press, it would seem others have had similar experiences.

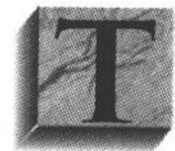
This book is divided into two units, the first containing preparatory material for the Oracle8i Introduction to SQL and PL/SQL exam—part of Oracle's Oracle8i DBA certification track. The first unit has six chapters, each containing several discussions that focus on a particular topic or subtopic objective listed by the Oracle Certified Professional Oracle8i DBA Track Candidate Guide. (For a complete listing of all the topics on the candidate guide, check the Introduction.) These discussions are followed by a For Review section, each listing the three or four most important concepts for you to retain from the discussion. After the review, you'll see two to six exercise questions in exam-based multiple-choice or short answer format. Following the questions you will find an answer key for those questions, which should help you master the material even more quickly. Thus, with this book you're never more than a few pages away from demonstrating what you've learned about Oracle8i SQL and

PL/SQL for the OCP exam. At the end of each chapter, you will find a short summary of what was covered in the chapter, followed by a Two-Minute Drill. The Two-Minute Drill contains another bullet list of fast facts to review, or “crib notes” for the days leading up to your OCP exam. The chapters conclude with 12-20 short-answer and exam-based multiple-choice questions designed to help you further to test your understanding of the materials you learned in the chapter.

The second unit consists of one chapter containing three full-length practice exams. Each test contains exam-based multiple choice and scenario-based questions that are designed to help you strengthen your test-taking skills for the OCP exams. You will also find answers and in-depth explanations for every question in the practice exams in the back of that chapter, along with a reference back to the exam topic and subtopic objectives from the OCP Candidate Guide. This feature should help you determine your areas requiring further improvement with pinpoint accuracy.

Finally, a note about updates and errata. Because OCP covers such vast ground in a short time, this has become a living text. If you feel you have encountered difficulties due to errors, you can either check out **[www.exampilot.com](http://www.exampilot.com)** to find the latest errata, or send me an email directly at **[jcouchman@mindspring.com](mailto:jcouchman@mindspring.com)**. Good luck!

# Acknowledgments



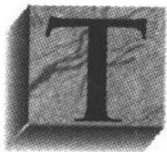
here are many people I would like to thank for their help with writing this book. My first and most heartfelt thanks goes to the dedicated readers of my other books who took time out of their busy schedules to send feedback on the book. I have listened to your praise and constructive criticism, and made every effort to correct and amplify my work based on the points you made. Please, keep the email coming—it is by far the most effective way to make the book better!

Ulrike Schwinn has been a loyal associate, colleague, and friend during my ongoing effort to help 80,000+ readers get Oracle certified. Thanks also to Julia Johnson, Mike Serpe, Jim Dilanni, and Chris Pirie from Oracle University for their feedback and assistance with overall direction for the OCP DBA track. As always, thanks to the fine folks at Osborne—Scott Rogers, Jeremy Judson, Ross Doll, Sheldon Barry, Carol Rosenow, and Julie Smith. Special thanks to the folks in production as well—and to both Bart Reed and Marilyn Smith for their thorough copy edit and for accommodating some important last-minute changes.

The last person I'd like to thank is Joseph Manning, the man to whom my eighth book is dedicated. Joseph was a professor of Computer Science at Vassar College when I was part of that program many years ago. Thinking back to that first day of Computer Science 123, when I sat in the back of his class, I can still feel the rush of excitement about computer technology that only comes when you have someone who can explain difficult concepts with the flair and wit that Joseph possesses.

Unfortunately, Vassar College no longer enjoys his expert talent, but Vassar's loss is University College Cork's gain. Its probably for the best, though—you can take the Irishman out of Ireland (for a little while, at least), but you'll never take Ireland out of the Irishman. Joseph, thanks for being such a great teacher and an even better colleague and friend!

# Introduction



The Oracle Certified Professional DBA certification exam series from Oracle Corporation is a great opportunity for you to demonstrate your expertise on the use of Oracle database software. Called OCP, it represents the culmination of many people's request for objective standards in Oracle database administration, one of the hottest markets in the software field. The presence of OCP on the market indicates an important reality about Oracle as a career path. Oracle is mature, robust, and stable for enterprise-wide information management. However, corporations facing a severe shortage of qualified Oracle professionals need a measurement for Oracle expertise.

The OCP certification core track for DBAs consists of five tests in the following areas of Oracle8i: SQL and PL/SQL, database administration, performance tuning, network administration, and backup/recovery, with the current content of those five exams covering Oracle through Oracle8i.. As of this printing, each test consists of about 60 multiple choice questions pertaining to the recommended usage of Oracle databases. You have about 90 minutes to take each exam. Obtaining certification for Oracle8i through the core track is contingent on taking and passing *all five* core examinations. This book will help you prepare for the first exam in that track, which incidentally is the first exam in the Internet Developer track as well.

## Why Get Certified?

If you are already an Oracle professional, you may wonder, "Why should I get certified?" Perhaps you have a successful career as an Oracle DBA or developer, enjoying the instant prestige your resume gets with that one magic word on it. With market forces currently in your favor, you're right to wonder. But, while no one is saying you don't know Oracle when you put the magic word on your resume, can you prove how well you *do* know Oracle without undergoing a technical interview? I started asking myself that question last year when Oracle certification began to emerge. I was surprised to find out that, after years of using Oracle, developing Oracle applications, and administering Oracle databases for Fortune 500 companies, there were a lot of things about Oracle I *didn't* know. And the only reason I know them now is because I took the time and effort to become certified.

If you're looking for another reason to become certified in Oracle, consider the experience of computer professionals with Novell NetWare experience in the late 1980s and early 1990s. Back then, it seemed that anyone with even a little experience in Novell could count on a fantastic job offer. Then Novell introduced its CNE/CNA programs. At first, employers were okay with hiring Novell professionals whether they had a certificate or not. As time went on, however, employers no longer asked for computer professionals with Novell NetWare *experience*—they asked for CNEs and CNAs. A similar phenomenon can be seen in the arena of Microsoft Windows NT, where the MCSE has already become the standard by which those professionals are measuring their skills. Furthermore, with the latest economic downturn in the technology-driven US economy comes the possibility of involuntary IT job changes. If you want to stay competitive in the field of Oracle database administration or development through those changes, your real question shouldn't be *whether* you should become certified, but *when*.

If you are not in the field of Oracle development or database management, or if you want to advance your career using Oracle products, there has never been a better time to do so. OCP is already altering the playing field for DBAs and developers by changing the focus of the Oracle skill set from "how many years have you used it" to "do you know *how* to use it?" That shift benefits organizations using Oracle as much as it benefits the professionals who use Oracle because the emphasis is on *skills*, not attrition.

Managers who are faced with the task of hiring Oracle professionals can breathe a sigh of relief with the debut of OCP as well. By seeking professionals who are certified, managers can spend less time trying to determine if the candidate possesses the Oracle skills for the job, and more time assessing the candidate's work habits and compatibility with the team.

# The Oracle Certified Professional Oracle8i DBA Track Candidate Guide

The following topic areas are covered in OCP Exam 1. Note that these concepts are taken directly from the Oracle OCP Candidate Guide for OCP Exam 1 and are current as of the publication of this book. It is essential that you begin your preparation for the OCP DBA certification exams by understanding the test contents. You can download the most current OCP Candidate Guide for the Oracle8i DBA track from the Oracle University website, <http://www.oracle.com/education/certification>. The Candidate Guide publishes the topic areas for each exam corresponding to chapter and section discussions in this book.

The topics and subtopics are as follows:

1. Overview of Relational Databases, SQL, and PL/SQL
  - 1.1. Discuss the theoretical and physical aspects of a relational database
  - 1.2. Describe the Oracle implementation of the RDBMS and ORDBMS
  - 1.3. Describe the use and benefits of PL/SQL
2. Writing Basic SQL Statements
  - 2.1. List the capabilities of SQL `select` statements
  - 2.2. Execute a basic `select` statement
  - 2.3. Differentiate between SQL statements and SQL\*Plus commands
3. Restricting and Sorting Data
  - 3.1. Limit the rows retrieved by a query
  - 3.2. Sort the rows retrieved by a query
4. Single-Row Functions
  - 4.1. Describe various types of functions available in SQL
  - 4.2. Use character, number, and date functions in `select` statements
  - 4.3. Describe the use of conversion functions
5. Displaying Data from Multiple Tables
  - 5.1. Write `select` statements to access data from more than one table using equality and nonequality joins

- 5.2.** View data that generally does not meet a join condition by using outer joins
  - 5.3.** Join a table to itself
- 6.** Aggregating Data Using Group Functions
  - 6.1.** Identify the available group functions
  - 6.2.** Describe the use of group functions
  - 6.3.** Group data using the `group by` clause
  - 6.4.** Include or exclude grouped rows using the `having` clause
- 7.** Subqueries
  - 7.1.** Describe the types of problems that subqueries can solve
  - 7.2.** Define subqueries
  - 7.3.** List the type of subqueries
  - 7.4.** Write single-row and multiple-row subqueries
- 8.** Multiple-Column Subqueries
  - 8.1.** Write multiple-column subqueries
  - 8.2.** Describe and maintain the behavior of subqueries when NULL values are retrieved
  - 8.3.** Write subqueries in a `from` clause
- 9.** Producing Readable Output from SQL\*Plus
  - 9.1.** Produce queries that require an input variable
  - 9.2.** Customize the SQL\*Plus environment
  - 9.3.** Produce more readable output
  - 9.4.** Create and execute script files
  - 9.5.** Save customizations
- 10.** Manipulating Data
  - 10.1.** Describe each DML statement
  - 10.2.** `insert` rows into a table

- 10.3.** update rows in a table
- 10.4.** delete rows from a table
- 10.5.** Control transactions
- 11. Creating and Managing Tables**
  - 11.1.** Describe the main database objects
  - 11.2.** Create tables
  - 11.3.** Describe the datatypes that can be used when specifying column definition
  - 11.4.** Alter table definitions
  - 11.5.** Drop, rename, and truncate tables
- 12. Including Constraints**
  - 12.1.** Describe constraints
  - 12.2.** Create and maintain constraints
- 13. Creating Views**
  - 13.1.** Describe a view
  - 13.2.** Create a view
  - 13.3.** Retrieve data through a view
  - 13.4.** insert, update, or delete data through a view
  - 13.5.** Drop a view
- 14. Oracle Data Dictionary**
  - 14.1.** Describe the data dictionary views a user may access
  - 14.2.** Query data from the data dictionary
- 15. Other Database Objects**
  - 15.1.** Describe database objects and their uses
  - 15.2.** Create, maintain, and use sequences
  - 15.3.** Create and maintain indexes
  - 15.4.** Create public and private synonyms

**16. Controlling User Access**

- 16.1.** Create users
- 16.2.** Create roles to ease setup and maintenance of the security model
- 16.3.** Use the `grant` and `revoke` commands to grant and revoke object privileges

**17. Declaring variables**

- 17.1.** List the benefits of PL/SQL
- 17.2.** Describe the basic PL/SQL block and its sections
- 17.3.** Describe the significance of variables in PL/SQL
- 17.4.** Declare PL/SQL variables
- 17.5.** Execute a PL/SQL block

**18. Write Executable Statements**

- 18.1.** Describe the significance of the executable section
- 18.2.** Write statements in the executable section
- 18.3.** Describe the rules of nested blocks
- 18.4.** Execute and test a PL/SQL block
- 18.5.** Use coding conventions

**19. Interacting with the Oracle Server**

- 19.1.** Write a successful `select` statement in PL/SQL
- 19.2.** Declare the datatype and size of the PL/SQL variable dynamically
- 19.3.** Write DML statements in PL/SQL
- 19.4.** Control transactions in PL/SQL
- 19.5.** Determine the outcome of SQL statements

**20. Writing Control Structures**

- 20.1.** Identify the uses and types of control structures
- 20.2.** Construct an `if` statement

- 20.3.** Construct and identify different loop statements
- 20.4.** Use logic tables
- 20.5.** Control block flow using nested loops and labels
- 21.** Working with Composite Datatypes
  - 21.1.** Create user-defined PL/SQL records
  - 21.2.** Create a record with the `%rowtype` attribute
  - 21.3.** Create a PL/SQL table
  - 21.4.** Create a PL/SQL table of records
  - 21.5.** Describe the difference between records, tables, and tables of records
- 22.** Writing Explicit Cursors
  - 22.1.** Distinguish between an implicit and an explicit cursor
  - 22.2.** Use a PL/SQL record variable
  - 22.3.** Write a `cursor for loop`
- 23.** Advanced Explicit Cursor Concepts
  - 23.1.** Write a cursor that uses parameters
  - 23.2.** Determine when a `for update` clause in a cursor is required
  - 23.3.** Determine when to use the `where current of` clause
  - 23.4.** Write a cursor that uses a subquery
- 24.** Handling Exceptions
  - 24.1.** Define PL/SQL exceptions
  - 24.2.** Recognize unhandled exceptions
  - 24.3.** List and use different types of PL/SQL exception handlers
  - 24.4.** Trap unanticipated errors
  - 24.5.** Describe the effect of exception propagation in nested blocks
  - 24.6.** Customize PL/SQL exception messages

## How Should You Prepare for the Exam?

If you spend your free time studying things like the maximum number of nested subqueries permitted in SQL, you are probably ready to take the OCP Oracle8i SQL and PL/SQL exam now. For the rest of us, Oracle and other companies offer classroom- and computer-based training options to learn Oracle. Now, users have another option—this book! By selecting this book, you demonstrate two excellent characteristics—that you are committed to a superior career using Oracle products, and that you care about preparing for the exam correctly and thoroughly. And by the way, the maximum number of subqueries permitted in SQL is 255, and it is on the OCP Oracle8i SQL and PL/SQL exam. That fact, along with thousands of others, is covered extensively in this book to help you prepare for, and pass, the OCP Oracle8i SQL and PL/SQL exam.

## DBA Certification Past and Present

Oracle certification started in the mid 1990s with the involvement of the Chauncey Group International, a division of Educational Testing Service. With the help of many Oracle DBAs, Chauncey put together an objective, fact-based and scenario-based examination on Oracle database administration. This test did an excellent job of measuring knowledge of Oracle7, versions 7.0 to 7.2. Consisting of 60 questions, Chauncey's exam covered several different topic areas, including backup and recovery, security, administration, and performance tuning, all in one test.

Oracle Corporation has taken DBA certification ahead with the advent of OCP. Their certification examination is actually five tests, each consisting of about 60 questions. By quintupling the number of questions you must answer, Oracle requires that you have unprecedented depth of knowledge in Oracle database administration. Oracle has also committed to including scenario-based questions on the OCP examinations, and preparation material for these new questions is included in this book as well. Scenario-based questions require you to not only know the facts about Oracle, but also understand how to apply those facts in real-life situations.

Oracle's final contribution to the area of Oracle certification is a commitment to reviewing and updating the material presented in the certification exams. Oracle-certified DBAs will be required to maintain their certification by retaking the certification exams periodically—meaning that those who certify will stay on the cutting edge of the Oracle database better than those who do not.

## The Next Steps

Next, you should be sure to understand the test interface you will encounter on exam day. Figure 1-1 contains a diagram of the actual test graphical user