Oracle Database 10g Express

This tutorial prepares the Oracle Database 10g Express Edition Developer to perform common development and administrative tasks of Oracle Database 10g Express Edition.

Objectives

After taking this tutorial, you should be able to:

- Install Oracle Database 10g Express Edition
- Access the Oracle Database Home Page
- Manage Database Objects
- Access and Manipulate Data

What is Oracle Database 10g Express Edition?

Oracle Database 10g Express Edition (Oracle Database XE) is a free, downloadable version of the world's most capable relational database.

Oracle Database XE is easy to install and easy to manage.

With Oracle Database XE, you use the Database Home Page, an intuitive browser-based interface, to administer the database; create tables, views, and other schema objects; import, export, and view table data; run queries and SQL scripts; and generate reports.

Oracle Database XE includes Oracle HTML DB 2.1, a declarative, graphical development environment for creating database-centric Web applications. In addition to HTML DB 2.1, you can use popular Oracle and third-party languages and tools to develop your Oracle Database XE applications.

Installation

Installation of Oracle Database 10g Express Edition is extremely easy and can be done in less than 15 minutes.

Oracle Database 10g Express Edition can be installed on both Linux and Windows platforms.

What to Do First

In this module, you learn how to log in to the Oracle Database 10g Express Edition browser-based user interface, create administration and database users.

Users access Oracle Database 10g Express Edition through database user accounts. Some of these accounts are automatically created administrative accounts—accounts with database administration privileges. You log in with these accounts to create and manage other user accounts and to maintain database security.

Creating a New Administration Account

The installation process creates an account named SYSTEM. This account is considered an administrator account because it has DBA access.
Using an Oracle best practice, try to create its own administrator account and password so that you can create
database user accounts when needed!!!

Steps:

1. Log in as SYSTEM
2. Select Administration>Database Users>Create User
3. Input user information, check the DBA role for user and click Create

Create your own administrator account!

Creating a New Database User Account

You can now log in with your administration account and create the necessary developer user accounts. Another user
needs access to develop his portion of the application later, so you will create a new account for him!!!

The same steps but don’t check the DBA role for user.

Create a user account!

Loading Data

You have an sql file manager that contains all the necessary commands and insert statements to load into the Oracle
Database 10g Express Edition database.

The script that will be loaded is called http://software.ucv.ro/~aion/pbd.html.

This data contains information about each employee and about that employee's department.

Steps:

1. Log in with your account
2. Select SQL>SQL Scripts> Upload
3. Select the file you want to upload and click Upload
4. Select the file icon and click Run twice to execute the script
5. Review the results of the execution
6. Browse the database objects and data

Working with Database Objects

Oracle Database XE provides an organized mechanism for storing, managing, and retrieving information. Tables are
the basic storage structure for holding business data. In this module, you learn how to create tables and work with
them.

You may want to modify data entered in tables. You may also want to maintain integrity with the data. Sometimes, you
may want to remove tables that are no longer useful.

- Creating tables

You create tables with the SQL CREATE TABLE statement. With Oracle Database XE, you have two options
for creating tables.
Use the graphical interface that generates the SQL statement
Enter the `CREATE TABLE` statement in the SQL Workshop tool

When creating tables, you must provide:

- Table name
- Column name(s)
- Data types for each column

Guidelines for creating tables:

- Table and column naming rules

| Must start with a letter, which is followed by a sequence of letters, numbers, _, #, or $ |
| Must be 1 to 30 characters long |
| Must not be an Oracle server reserved password |

- Most common data types

| VARCHAR2 | NUMBER | DATE | TIMESTAMP | CHAR |

You can also set up constraints on your columns to control the data in them.

1. Creating Tables by Using the Object Browser

Create the `DEPENDENTS` table, which will contain the following columns: Id, FirstName, LastName, BirthDate, Relation, Gender, Benefits, and RelativeId.

In the `DEPENDENTS` table, no two rows have the same ID. The `Gender` column holds only one value of M or F. Also, the `Benefits` column stores large blocks of character data.

Steps:

1. Log in to Oracle Database XE
2. Click the Object Browser
3. Go to Create. Click the Table link
4. Enter the table name and column definitions. Click Next
5. Specify the primary key information. Click Next
6. Specify the foreign key information. Click Add
7. Proceed to check constraint information. Click Finish
2. Creating Tables Using SQL

Sheila needs to create the AUDIT_RECORD_TB1 table. This table will contain two columns. The user_value column is of the data type varchar2, and the date_recorded column is of the data type timestamp. Later, Sheila will use this table to record audit information when the salary column in the EMPLOYEES table changes.

Steps:

1. Navigate to Oracle Database>Home Page
2. Click the SQL command
3. Go to SQL Commands
4. Click Enter Command
5. Type the SQL command
6. Click Run

3. Creating a Copy of a Table

To copy the EMPLOYEES table so that she can practice without affecting the real data.

Create a copy of the table by using the Object Browser.

4. Modifying Tables

You can modify tables using the SQL ALTER TABLE statement. You may need to change the table structure due to any of the following reasons:

- You omitted a column.
- Your column definition needs to be changed.
- You need to remove columns.

The ALTER TABLE statement is used to:

- Add a new column
- Modify an existing column
- Define a default value for the new column
- Drop a column
- Manage constraints

In Oracle Database XE, you can modify tables:

- Using the Object Browser
- Using the SQL Workshop tool

5. Adding a New Column

Add a new column BirthDate of Date type to the EMPLOYEES table by using the Object Browse.

6. Managing Constraints

What Are Constraints?
Data integrity ensures the consistency and correctness of data stored in a database. Such integrity can be enforced by incorporating business rules. Constraints are the rules that are enforced on data stored in a table.

Why Should I Use Constraints?

You can use constraints to do the following:

- Enforce rules on the data in a table whenever a row is updated, inserted, or deleted from that table
- Prevent the deletion of a table if there are dependencies from other tables

Types of Constraints:

- PRIMARY KEY

  The PRIMARY KEY constraint is a column or a set of columns that uniquely identifies each row in a table. This constraint enforces uniqueness of the column or column combination. It ensures that no column that is part of the primary key can contain a null value. A null value is a value that does not exist.

  For example, in the DEPENDENTS table, the column ID is the primary key. This column will not allow either a duplicate value or a null value.

- FOREIGN KEY

  The FOREIGN KEY constraint designates a column or a combination of columns as a foreign key. It establishes a relationship between a primary key or a unique key in the same table or different table. A foreign key enforces that the value within the column matches the value in the relationship column.

  For example, the RelativeId column in the DEPENDENTS table refers to the EMPLOYEES table. You cannot delete a record in the EMPLOYEES table whose RelativeId is used in the DEPENDENTS table. Also, with a non-existing RelativeId in the EMPLOYEES table, you cannot insert a record into the DEPENDENTS table.

- CHECK
The CHECK constraint enforces integrity by restricting the values to be inserted in a column. It defines a condition that each row must satisfy. You can define multiple check constraints on a single column. Also, you can apply a single check constraint to multiple columns.

For example, when you impose the CHECK constraint on the Gender column in the DEPENDENTS table, you can specify that the only valid values are either M or F.

- **UNIQUE**

The UNIQUE constraint requires that no two rows of a table can have duplicate values in a specified column or a set of columns. A table can have more than one unique key. If the UNIQUE constraint comprises more than one column, then the group of columns is called a composite key.

For example, you can impose the UNIQUE constraint on the Email column of the EMPLOYEES table. You ensure that each employee has a unique email ID.

- **NOT NULL**

Constraints can be enforced at two levels:

- Column level
- Table level

A constraint can be created with either of the following statements:

- CREATE TABLE
- ALTER TABLE

With the ALTER TABLE statement, you can disable or enable the imposed constraint without dropping it or re-creating it:

- Disable a constraint by using the DISABLE clause.
- Enable a constraint by using the ENABLE clause.

1. Manage the constraints on the DEPENDENTS table by using the Object Browser:

**Steps:**

1. Navigate to Oracle Database XE>Home Page
2. Click the Object Browser arrow
3. Go to Browse
4. Click the Table link
5. Click the table name
6. Click Constraints
7. Click Create
8. Specify the constraint information
9. Click Next
10. Click Finish

Create two constraints on table Dependents:

1. Dependents_CON: the Gender column to take the values ('M', 'F') and
2. Dependents_FK: the relativeid is the foreign key (reference Employees(Employee_ID))

2. Disable the foreign key constraint on the DEPENDENTS table by using the appropriate SQL statement.

Steps:

1. Click the SQL arrow
2. Go to SQL Commands
3. Click Enter Command: SQL “Alter table dependents disable constraint dependents_fk”
4. Type the SQL command
5. Click Run

• Accessing Data

In this module, you learn how to retrieve data from tables. The SQL SELECT statement is used to access and report data back from the XE tables. This is known as "querying" the data. In XE, you can either write SELECT statements using the SQL Workshop tool, or you can use the Query Builder tool to build queries with a GUI interface.

1. Building Queries

• Use the SQL Workshop tool to type her SELECT statements
• Use the Query Builder tool to build the query graphically

Bibliografie:

www.oracle.com