

Building Applications Using Oracle Database 11g Express Edition

Slide 1: Course Introduction

Hello and welcome to this online, self-paced course titled Oracle Database 11g Express Edition – Building Applications Using Oracle Database 11g Express Edition. My name is Anupama Mandya, and I am part of Oracle Corporation's Curriculum Development team. This course is part of Oracle Database 11g Express Edition New Features Self-Study series.

In this course, using demonstrations, I will be discussing about Developing Applications in various technologies using the Express Edition Database.

Slide 2: Using the Player

Before we begin, take a look at some of the features of this Flash-based course player. If you've attended similar Oracle eStudy courses in the past then, feel free to skip this slide.

To your left, you will find a hierarchical course outline. This course enables and even encourages you to go at your own pace, which means you are free to skip over topics you already feel confident on, or jump right to a feature that really interests you, or go back and review topics that were already covered. Simply click on a course section to expand its contents and then select an individual slide. However, note that by default we will automatically walk you through the entire course without requiring you to use the outline.

To the right of the course outline tab is the transcripts tab, which contains any additional reference notes for the current slide. Feel free to read these reference notes at the conclusion of the course. Or if you prefer you can read them as we go along.

The third tab in the left panel is where you can search for content in this course.

Standard Flash player controls are also found at the bottom of the player, including pause, previous, and next buttons. There is also an interactive progress bar to fast forward or rewind the current slide. Interactive slides may have additional controls and buttons along with instructions on how to use them.

To the right of the standard Flash player controls is the Full Screen control. Click on it once to hide the course outline panel, and click it again to maximize the course display. This may be useful when viewing videos and demos embedded in the course.

The course will now pause, so feel free to take some time and explore the interface. Then when you're ready to continue, click the next button below or alternatively click the Lesson 1 slide in the course outline at left.

Slide 3: About This Course

So, you know the title of the course. But, you may be asking yourself "Am I in the right place?" To help you answer these questions, you can access information here regarding the course objectives, target audience and the prerequisites. Once finished, click the Next Topic button.

Slide 4: Tutorial Scenario

I would like to introduce you to Sheila. "Hi, I am Sheila and I work for Sperling Supplies Corporation, which is a family owned supply store. Sperling Supplies offers computers, computer hardware, office supplies, etc. Over the last few years, Sperling Supplies has tripled its profits and doubled its personnel. As a result, I have been hired to help develop applications using various technologies to the new Human Resource system so that Sperling Supplies may offer benefits to its employees. Over the course of this tutorial, you will watch me use various technologies to build applications using Oracle Database 11g Express Edition".

Slide 5: Developing Applications Using Oracle Database 11g Express Edition

Overview: In this module, you learn how to build applications in various technologies using Oracle Database 11g Express Edition. You learn how to connect to the XE database from these applications and display results from the database in your application. The technologies include

Oracle Application Express

Java

Microsoft Visual Studio .Net and

PHP

Oracle Database 11g Express Edition: This represents Oracle Database 11g Express Edition. Oracle Database 11g Express Edition is used to build applications in various technologies.

The segments around the core are some such technologies that use Oracle Express Edition Database.

Oracle Application Express: Oracle Application Express is a Web application development tool for the Oracle database.

Application Express is used to assemble an HTML interface (or application) on top of database objects such as tables and procedures.

Java: Java is one such technology which uses JDBC (Java Database Connectivity) which is a database access protocol that enables you connect Java to a database and run SQL statements and queries on the database.

Oracle Database Express Edition provides support for the client-side application development through the JDBC Thin Driver. The JDBC Thin Driver allows a direct connection to the database by providing a pure Java implementation of Oracle network protocols.

Visual Studio .Net: The Microsoft .NET Framework is a multi-language environment for building, deploying, and running applications and XML Web services. Oracle Data Provider for .NET (ODP.NET) provides fast and efficient data access from .NET client applications to Oracle databases and access to other Oracle Database features.

PHP: PHP is a popular scripting language that can be embedded in HTML which makes it particularly useful for Web development.

Oracle Database Express Edition can be used to connect to PHP and display results from the database

Slide 6: Road Map

In the first topic in this course, we discuss about building a simple application using Oracle Application Express.

Slide 7: Oracle Application Express

About Oracle Application Express

Oracle Application Express is a rapid Web application development tool for the Oracle database. Using only a Web browser and limited programming experience, you can develop professional applications that are both fast and secure. Thanks to built-in features such as user interface themes, navigational controls, form handlers, and flexible reports, Oracle Application Express accelerates the application development process.

From the end user's perspective, the deployed applications require only a browser and access to an Oracle database running Application Express.

Oracle Application Express installs within Oracle Database Express Edition (Oracle Database XE) and is comprised of data in tables and PL/SQL code.

Whether you run the Oracle Application Express development environment or an application built using Oracle Application Express, the process is the same. Your browser sends a URL request that is translated into the appropriate Oracle Application Express PL/SQL call. After the database processes the PL/SQL, the results are relayed back to your browser as HTML. This cycle happens each time you request or submit a page.

The application session state is managed in the database tables within Oracle Application Express. It does not use a dedicated database connection. Instead, each request is made through a separate database session, consuming minimal CPU resources. In this topic, we discuss how an application is built in Oracle Application Express by connecting to the Express Edition database.

Creating a Workspace and Logging into Oracle Application Express:

Before developing an application, you need to set up your local development environment by creating a workspace and logging into Oracle Application Express.

The area where you develop applications is called a workspace. A workspace is a virtual private database within the Oracle Application Express development environment that has a unique ID and name that enables multiple users to work within the same Oracle Application Express installation while keeping their objects, data, and applications private.

Getting Started with Oracle Application Express

When you log in to Oracle Application Express, the Workspace home page appears. It consists of four components. They are

- **Application Builder.** Use Application Builder to assemble an HTML interface (or application) on top of database objects such as tables and procedures.
- **SQL Workshop.** Use the SQL Workshop to access tools for viewing and managing database objects.
- **Team Development.** Use Team Development to track new features, non-feature to do tasks, bugs, and milestones. Users can also provide real-time feedback which then can be categorized into features, to do tasks, or bugs.
- **Administration** links to the Workspace Administration page.

Viewing your Database Objects:

You can view your database objects by going to the Object Browser in SQL Workshop. Object Browser enables you to browse, create, and edit objects in your database.

Building Your Application

To create your application, follow some of these steps

1. Log in to Oracle Application Express
2. On the Workspace Home Page, click Application Builder
3. Click the Create button and select Database for Method

Continue by Adding a Page and specifying the Page details. After creating the page, preview your application by running it.

Slide 8: Demo Setup

Following this slide are some demonstrations about the topic “Building an Application in Oracle Application Express”. The demonstrations are video recordings of certain topics discussed. The demonstrations are based on the tutorial scenario.

Slide 11: Road Map

The next topic in this course is about Using Java with Oracle Database 11g Express Edition Database

Slide 12: Java and Oracle 11g Express Edition

Overview

In this module, we discuss how to create a simple Java application by connecting to Oracle Database Express Edition and access data.

Oracle Database is a relational database that you can use to store, access, and modify data. The Java Database Connectivity (in short JDBC) standard is used by Java applications to access and manipulate data in relational databases.

JDBC is an industry-standard application programming interface (API) that lets you embed SQL statements in Java code.

JDBC is a database access protocol that enables you to connect to a database and run SQL statements and queries on the database.

Oracle Database XE provides support for the client-side application development through the JDBC Thin Driver and the Oracle Call Interface (OCI) Driver, and the `oracle.sql` and `oracle.jdbc` packages.

Oracle recommends using the JDBC Thin Driver for most requirements. The JDBC Thin Driver allows a direct connection to the database by providing a pure Java implementation of Oracle network protocols

You can use Oracle JDeveloper which is an IDE to create an application to query and display the data from the Oracle XE Database.

Getting Started

To be able to develop a simple application, first you need to install Oracle JDeveloper .

Oracle JDeveloper is an Integrated Development Environment that is used to create simple applications using JDBC.

You can download JDeveloper from Oracle's Oracle technology network website

Connecting to Oracle Database Express Edition from JDeveloper

You can create parts of a Java Application that accesses Oracle Database XE and displays data. To be able to access the database from a Java application, you must connect to the database using a `java.sql.Connection` object.

You can set up and manage database connections in JDeveloper to enable your application to communicate with external data sources, including Oracle Database XE and offline database objects. This is done using the Database Navigator.

Create a Simple Java Application and Connect to Oracle Database Express Edition from the Application

After creating the database connection, you can create your application using JDeveloper Application Navigator. The Application Navigator shows a logical grouping of the items in your projects.

In Java, you use an instance of the `DataSource` object to get a connection to the database.

The `DataSource` interface provides a complete replacement for the previous `JDBC DriverManager` class. Oracle implements the `javax.sql.DataSource` interface with the `OracleDataSource` class in the `oracle.jdbc.pool` package. The overloaded `getConnection` method returns a physical connection to the database.

The first step in building a Java application is to create a Java class. To create a connection use the `OracleDataSource.getConnection` method

You can create a class called `DataHandler` which will contain the methods for querying the database.

Oracle JDeveloper comes with standard libraries to help Java application programming. You may include the `oracle.jdbc` package that provides access to Oracle SQL-format data and other Oracle-specific features.

Querying for and Displaying Data in JDeveloper

You can add functions and code to the `DataHandler.java` file.

To query Oracle Database Express Edition from a Java class to retrieve data, you must do the following:

1. To query for data in Oracle Database Express Edition, you create a connection by using the `OracleDataSource.getConnection` method.
2. Define your SQL Statements with the methods available for the connection object. The `createStatement` method is used to define a SQL query statement.
3. Using the methods available for the statement, run your queries. You use the `executeQuery` method to run queries on the database and produce a set of rows that match the query conditions. These results are contained in a `ResultSet` object.
4. You use a `ResultSet` object to display the data in the application pages.

Slide 13: Demo Setup

Following will be some demonstrations and simulations about the topic “Java and Oracle Database 11g Express Edition”. The demonstrations are video recordings of certain topics in developing the application and simulation is a step by step method of performing certain actions of a topic based on the instructions given to you. All simulations are silent. Both demonstrations and simulations are based on the tutorial scenario.

Slide 18: Road Map

The next topic in this course is on Creating a Simple Application in Microsoft Visual Studio .Net using Oracle Developer Tools.

Slide 19: Creating a Visual studio .Net Application

Overview

In this topic, we discuss about application development on Oracle Database with Oracle technologies for the Microsoft .NET Framework using the key features of Oracle Data Provider for .NET and Oracle Developer Tools for Visual Studio

To build an application using Oracle .Net products, you will have to:

1. Install and configure Oracle Developer Tools for Visual Studio .NET
2. Connect to the Oracle Express Edition Database
3. Create a table and Insert data into it using Oracle Developer Tools
4. Generate a Visual C# application by adding a DataGrid and Run the application

Installing Oracle Developer Tools for Visual Studio .NET

Oracle Developer Tools for Visual Studio (ODT) is a set of application tools that integrate with the Visual Studio environment. These tools provide graphical user interface access to Oracle functionality, enable the user to perform a wide range of application development tasks, and improve development productivity and ease of use. Oracle Developer Tools supports the programming and implementation of .NET stored procedures using Visual Basic, C#, and other .NET languages.

You will need to download the Oracle Developer Tools (ODT) for Visual Studio and Oracle Data Provider for .NET and other Oracle Data Access Components(ODAC)products from Oracle Technology Network,and install it on the computer where Microsoft Visual Studio .NET is already installed.

Connecting to the Oracle Database

After installing the ODAC products, you will need to create a database connection from your application to the database.You can connect to the database using the Oracle Developer Tools that you downloaded and installed.

Oracle Developer Tools for Visual Studio (ODT) is a tightly integrated Add-in for Visual Studio. Using enhancements that ODT brings to the Server Explorer, you can automatically create tables, indexes, constraints, data connections and other database schema objects. Additionally you can automatically generate application code.

Use the Server Explorer to connect to the Oracle Database for the purpose of automatically creating or modifying database schema objects.

Creating a Table and Inserting Data into the Table using Oracle Developer Tools

Oracle Developer Tools includes a user interface for creating database objects. You can create tables and add data into them very easily using Oracle Developer Tools.

Building a Simple .Net Application

With Oracle Developer Tools for Visual Studio .NET, an application can be built with minimal coding.

To develop an application by adding data to the form, you need to perform these steps. The first step is to generate the data set, the second step is to add a DataGrid to the form where the data will be shown, and the third is associating the data set as the data source for the DataGrid.

Slide 20: Demo Setup

Following will be some demonstrations and simulations about the topic “Creating a Visual Studio .Net Application”. The demonstrations are video recordings of certain topics in developing the application and simulation is a step by step method of performing certain actions of a topic based on the instructions given to you. All simulations are silent. Both demonstrations and simulations are based on the tutorial scenario.

Slide 25: Road Map

In the last topic of this course, we discuss about Developing a simple Application in PHP using the Express Edition Database.

Slide 26: Creating a Simple Application Using PHP

Overview

In this section, you see how to use PHP to connect to Oracle Database Express Edition and display results.

PHP is a popular scripting language that can be embedded in HTML which makes it particularly useful for Web development.

PHP frameworks are becoming popular and they should be evaluated when building any large application.

Getting Started

Before you start building your application in PHP, you should install Apache. Apache is typically installed by default on Linux computers.

Perform the following steps as shown to obtain Apache HTTP Server and PHP for Windows or Linux

Building the Departments Page

In this tutorial, we develop a simple application by displaying the Departments Page that implements PHP functions.

You will need to create some functions and styles in a PHP file to display the Departments Page. The sample script files for the functions and styles are available in the Attachments tab of this course.

Here are some steps that you will have to perform to develop the departments page:

1. Firstly, you have create a directory for your application files
2. To start developing the application user interface, use a text editor like notepad to create a file that contains functions with their parameters to enable your application Web pages to have consistent header and footer sections.
3. The PHP file uses a Cascading Style Sheet (CSS) file to specify the presentation style in HTML in the browser.
4. To call the user interface functions, you create a php file with PHP command that is used to include the CSS file.
5. Finally, you test the application by entering the URL containing the PHP file in the browser.

Connecting to Oracle Express Edition Database

You add a database connection to the Departments screen so that you can display Department data.

1. In the PHP file, use the `oci_connect` function to connect to the database by passing the username, password and Oracle Database Express Edition connection identifier parameters.
2. To execute a query, use the `oci_execute` function and fetch all the rows for the query executed.

Slide 27: Demo Setup

Following this slide are some demonstrations about the topic "Creating a Simple Application using PHP". The demonstrations are video recordings of certain topics in developing the application. The demonstrations are based on the tutorial scenario.

Slide 30: Course Review

Well, we have now come to the end of this course. In this course, we talked about

- Developing a Simple Application in Oracle Application Express

- Building an Application in Java and connecting to the Express Edition Database to Display Results
- Building a Visual C# Application and Displaying Results from the Database
- Developing a Web based Application in PHP by connecting to the Express Edition Database

Slide 31: How Can I Learn More

Oracle offers a variety of additional channels from which you can learn more about Oracle Database 11g Express Edition or about any Oracle products. We at Oracle Education know your time is valuable and limited, and so we thank you for participating in this self-paced training. We hope this course has met your expectations and learning objectives, and wish you the best of luck in all of your endeavors. Thanks again.