24 Accessing Databases with JDBC

Objectives

In this chapter you'll:

- Learn relational database concepts.
- Use Structured Query Language (SQL) to retrieve data from and manipulate data in a database.
- Use the JDBC™ API's classes and interfaces to manipulate databases.
- Use JDBC's automatic JDBC driver discovery.
- Embed a Swing GUI control into a JavaFX scene graph via a `SwingNode`.
- Use Swing's `JTable` and a `TableModel` to populate a `JTable` with a `ResultSet`'s data.
- Sort and filter a `JTable`'s contents.
- Use the `RowSet` interface from package `javax.sql` to simplify connecting to and interacting with databases.
- Create precompiled SQL statements with parameters via `PreparedStatement`s.
- Learn how transaction processing makes database applications more robust.

Outline

1. 24.1 Introduction
2. 24.2 Relational Databases
3. 24.3 A `books` Database
4. 24.4 SQL
    1. 24.4.1 Basic `SELECT` Query
    2. 24.4.2 `WHERE` Clause
    3. 24.4.3 `ORDER BY` Clause
    4. 24.4.4 Merging Data from Multiple Tables: `INNER JOIN`
    5. 24.4.5 `INSERT` Statement
    6. 24.4.6 `UPDATE` Statement
    7. 24.4.7 `DELETE` Statement
5. 24.5 Setting Up a Java DB Database
    1. 24.5.1 Creating the Chapter’s Databases on Windows
    2. 24.5.2 Creating the Chapter’s Databases on macOS
    3. 24.5.3 Creating the Chapter’s Databases on Linux
6. 24.6 Connecting to and Querying a Database
    1. 24.6.1 Automatic Driver Discovery
    2. 24.6.2 Connecting to the Database
    3. 24.6.3 Creating a `Statement` for Executing Queries
    4. 24.6.4 Executing a Query
    5. 24.6.5 Processing a Query’s `ResultSet`
7. 24.7 Querying the `books` Database

    1. 24.7.1 `ResultSetTableModel` Class
    2. 24.7.2 `DisplayQueryResults` App's GUI
    3. 24.7.3 `DisplayQueryResultsController` Class

8. 24.8 `RowSet` Interface
9. 24.9 `PreparedStatement`s

    1. 24.9.1 `AddressBook` App That Uses `PreparedStatement`s
    2. 24.9.2 Class `Person`
    3. 24.9.3 Class `PersonQueries`
    4. 24.9.4 `AddressBook` GUI
    5. 24.9.5 Class `AddressBookController`

10. 24.10 Stored Procedures
11. 24.11 Transaction Processing
12. 24.12 Wrap-Up

1. Summary
2. Self-Review Exercises
3. Answers to Self-Review Exercises
4. Exercises