JAV700 : Java Data Access with Hibernate

Code : JAV700 **Duration :** 3 days **Category :** Frameworks

Audience :

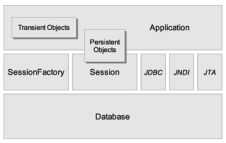
Experienced Java developers who want to use Hibernate for accessing data in databases.

Prerequisites :

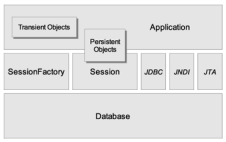
Experience with Java programming and object orientation is required. Knowledge of database structures and SQL is beneficial for a proper understanding.

Realization :

The concepts are treated by means of presentation slides and demos. The theory is interspersed with exercises. The course material is in English.



Java Data Access with Hibernate



Contents :

This course addresses Object Relational Mapping with Hibernate. After an overview of the data access capabilities in Java, including JDBC, and the challenge they face, the basic concepts and architecture of the Hibernate Framework is discussed. The role of the Hibernate configuration file is examined and the mapping of Java classes to database tables is discussed. Next attention is paid to the role and structure of the XML mapping files and the role of the various properties and attributes in these files. The central position of the Hibernate Session created through the SessionFactory is discussed and attention is paid to the various states that Java objects can have in relation to the database like persistent, transient and detached. The various key generation strategies are discussed and also the mapping of association and inheritance relationships to the database are part of the subject matter. Next attention is paid to the capabilities of Hibernate Query language, HQL, to Hibernate criteria and the use of native SQL queries. Finally also Hibernate transactions are discussed, the use of annotations as an alternative to XML mapping files is addressed and the different varieties of Hibernate caching are explained.

Module 1 : Java Persistence

Java Persistence
Traditional Persistence
Transparent Persistence
Persistence Technologies
Direct File I/O
Serialization
Java Database Connectivity
JDBC Architecture
Executing Statements
Retrieving Results
JDBC Drivers
JDBC URL's
Problems with JDBC

Module 2 : Hibernate Basics

What is Hibernate?
Hibernate Characteristics
Hibernate Configuration
Hibernate Configuration File
Persistent classes
Mapping Files
Hibernate Architecture
Hibernate Core Concepts
Storing Objects
Generated Table and SQL
Primary Key Column
Lifecycle States
Persistence Lifecycle

Module 3 : Mapping Persistent Objects

POJO's and JavaBeans
equals and hashcode
Basic Mappings
Class to Table Mappings
Property Mapping
Identifiers and Generators
Multiple Table Mappings
Hibernate SessionFactory
Hibernate Session
Entities and Values
Entity Lifecycle
Persistent State
Transient State
Persistent Object Updates
Automatic Dirty Checking
Detached State
Deleting Objects
Merging

Module 4 : Mapping Relationships

Type of associations
Many-to-one
Bidirectional Many-to-one
Mapping to List, Map
Mapping to Bag and Array
Using Comparator
One-to-one
Bidirectional One-to-one
Many-to-many
Bidirectional Many-to-many
Many-to-many Identifier Bag
Value Type Collections
Collections of Components
Sorting Collections
Cascading over associations
Lazy versus Eager Loading
Proxies
Detached Objects and Proxies
Polymorphic Associations

Module 5 : Mapping Inheritance

Inheritance Mapping Strategies
Single Table per Class Hierarchy
Single Table Data Model
Discriminator Columns
Advantages and Disadvantages
Table per Concrete Class Strategy
Table per Concrete Class with unions
Table per Class Data Model
Advantages and Disadvantages
Joined Subclass Strategy
Joined Data Model
Polymorphism
Choosing an Inheritance Strategy

Module 6 : Queries with HQL and Criteria

Hibernate Fetching Options
Hibernate Query Language
HQL Parameters
Named Queries
Native SQL
Criteria
Restrictions
Query By Example
Scrolling and Pagination
Query Hints
Query Option Pros/Cons
N+1 Selects
Join Fetching
Subselect Fetching
Batch Fetching
Queries and Fetching Strategies
Cartesian Product Problem

Module 7 : Transactions and Concurrency

Java Transaction API
JTA versus JDBC Transactions
Transaction Configuration
Hibernate Transaction API
Transaction handling pattern
Concurrency
Isolation Levels
Optimistic Locking
Versioning
Pessimistic Locking
ThreadLocal Transactions
Conversations
Session Lifetime
Concurrent Acces

Module 8 : Hibernate Annotations

Metadata
Annotations Pros/Cons
Configuring Hibernate Annotations
Entity and table annotation
Primary key annotations
Column annotations
Special
Relation annotations
Join column annotations
Components
Inheritance
EJB3/JPA Annotations

Module 9 : Hibernate Configuration

Connection Pools
The promise of Cache
Hibernate Caching Architecture
First Level Cache
Second Level Cache
Cache Concurrency
Configuring Second Level Cache
Cache Regions
Eviction