

## → Introduction to Hibernate

- Issues with Persistence layers and Object-Relational Mapping (ORM).
- Hibernate Overview and Benefits.
- Hibernate architecture overview.
- POJO (Plain Old Java Object) Based Mapping.

## → Getting started with Hibernate quickly

- Overview of the Hibernate distribution.
- Configuring Hibernate
  - hibernate.cfg.xml file
  - SessionFactory configuration
  - Connection properties, Database dialect
  - Configuration class, Session Interface
- "Hello World" Program for Hibernate.
- Mapping a Class.
  - Persistent Entity Class, Hibernate Mapping.
  - File, Mapping the Entity Class.
  - Primary keys: Id property, Generated Id.
- Hibernate Type System.
- Working with sessions and Persistent Objects.
- Logging - log4j Overview and configuration for Hibernate.

## → Querying

- Inserting and Updating Entities.
- HQL - Hibernate Query Language Overview
- The Query Interface.
- Creating and working with queries.
- Named Queries, Projection Queries, Aggregate Queries.

## → The Persistence Lifecycle

- Transaction Overview and Transactions in Hibernate.
- Hibernate Transaction API (in Managed and Non-managed Environments).
- The lifecycle of managed objects.
- Persistent, transient, and detached objects.
- The Persistence (Session) Context (Lifespan, Relation to Managed Objects, Propagation).
- Contextual Sessions.
- Synchronization to the Database.
- The Session as cache.

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## → Optimistic Locking / Versioning

- Detached Objects and Optimistic Locking.
- Versioning overview and Using Versioning.
- Locking Objects.

## → Relationships

- Object Relationship Overview.
- Mapping Collections of Value Objects.
- Entity Relationships: 1-N, N-1, N-N, 1-1.
- Mapping Entity Relationships.
- Uni and Bi-directional Relationships.
- The Relationship "inverse".
- Cascading Over Relationships.
- Queries Across Relationships (Lazy and Eager).

**→ Inheritance Mapping**

- Entity Inheritance with Hibernate.
- Table-per-class mapping.
- Table per Subclass mapping.
- Table per Concrete Class mapping.

**→ Additional Querying Capabilities**

- Projection Queries, Aggregate queries.
- Bulk updates and deletes.
- Native SQL Queries.
- Query Filters.

**→ The Criteria API**

- Overview of the Criteria API.
- Working Querying with the Criteria API.
- Query by Example.

**→ Hibernate and Java Persistence / EJB 3**

- Overview of Java Persistence / EJB 3.
- Relationship between Java Persistence and Hibernate.
- Overview of Annotations.
- Mapping Entities with Hibernate Annotations
- The EntityManager, Persistence Context and Persistence Unit.
- Working with Transactions - EntityTransaction, Managed, and Unmanaged Environments.
- Inserts and Updates.
- JPQL - Java Persistence Query Language.
- Versioning.
- Relationships.

**→ Advanced Topics**

- Components and Multi-Table Mapping.
- equals() and hashCode().
- Caching and Efficiency.
- Design Considerations.

