INFOSOFT IT SOLUTIONS

Training | Projects | Placements

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HIBERNATE FRAMEWORK TRAINING

1: Introduction to ORM and Hibernate

- Overview of Object-Relational Mapping (ORM)
- Understanding the need for ORM
- Introduction to Hibernate framework
- Setting up Hibernate environment
- Configuring Hibernate properties
- Hello World with Hibernate

2: Entity Mapping

- Understanding entity classes
- Mapping entity classes to database tables
- Primary key generation strategies
- Mapping basic data types
- Mapping associations (One-to-One, One-to-Many, Many-to-One, Many-to-Many)
- Lazy loading vs. Eager loading

3: Hibernate Query Language (HQL)

- Introduction to HQL
- Basic HQL syntax
- Retrieving objects using HQL
- Parameter binding in HQL
- Named queries and named parameter binding
- Using aggregate functions in HQL

4: Criteria API

- Introduction to Criteria API
- Building Criteria queries

- Query by Example (QBE) with Criteria API
- Restrictions and Projections
- Performing joins using Criteria API
- Pagination and sorting with Criteria API

5: Transaction Management

- Understanding transactions in Hibernate
- Configuring transaction management
- Transactional boundaries
- Transaction propagation and isolation levels
- Declarative transaction management with Spring and Hibernate

6: Caching

- Introduction to caching in Hibernate
- First-level cache (Session cache)
- Second-level cache (SessionFactory cache)
- Configuring caching strategies
- Cache concurrency strategies
- Monitoring and tuning cache performance

7: Advanced Topics

- Batch processing with Hibernate
- Native SQL queries
- Interceptors and events
- Hibernate Validator for data validation
- Integrating Hibernate with Spring framework
- Handling inheritance mapping strategies

8: Project Work

- Applying Hibernate in a project
- Designing the database schema
- Implementing CRUD operations using Hibernate
- Integrating Hibernate with other layers of the application
- Optimizing performance and resolving issues

1: Advanced topic

- Composite keys and composite primary keys
- Mapping inheritance hierarchies (Single Table, Joined, Table Per Class)
- Entity listeners and lifecycle callbacks
- Advanced mapping techniques (Embeddable objects, Immutable entities)
- Mapping Enums and custom types

2: Query Optimization and Performance Tuning

- Understanding N+1 query problem
- Fetching strategies (Join fetching, Batch fetching)
- Fetch profiles and entity graphs
- SQL tuning techniques
- Using Hibernate statistics for performance analysis
- Identifying and resolving performance bottlenecks

3: Advanced HQL and Criteria API

- Subqueries in HQL and Criteria API
- Collection joins and subqueries
- HQL functions and expressions
- Dynamic queries with Criteria API
- Criteria queries with DetachedCriteria
- Query hints and tuning options

4: Hibernate Search and Full-Text Searching

- Introduction to Hibernate Search
- Configuring Hibernate Search
- Indexing entities for full-text search
- Performing full-text search queries
- Advanced search features (Faceting, Sorting, Highlighting)
- Integrating Hibernate Search with Hibernate ORM

5: Hibernate Spatial

- Introduction to Hibernate Spatial
- Mapping spatial data types (Points, Lines, Polygons)
- Performing spatial queries
- Spatial indexing and query optimization

- Integrating Hibernate Spatial with GIS applications
- Real-world use cases and examples

6: Multitenancy with Hibernate

- Understanding multitenancy architectures
- Configuring multitenancy in Hibernate
- Different multitenancy strategies (Separate databases, Separate schemas, Shared schema)
- Tenant identification and resolution
- Tenant data isolation and access control
- Testing and deploying multitenant applications

7: Integrating Hibernate with NoSQL Databases

- Overview of NoSQL databases supported by Hibernate (MongoDB, Neo4j, etc.)
- Setting up Hibernate OGM (Object/Grid Mapper)
- Mapping entities to NoSQL data models
- Querying NoSQL databases using Hibernate
- Transaction management with NoSQL databases
- Performance considerations and best practices

8: Advanced Topics and Project Work

- Advanced caching strategies (Clustered caching, Query caching)
- Integrating Hibernate with microservices architecture
- Distributed transactions with JTA
- Data migration and schema evolution strategies
- Implementing security features (Authentication, Authorization)
- Advanced troubleshooting and debugging techniques