

HW#4 – Baran AYDIN

1 – What is JPA ?

The Java Persistence API (JPA) is a specification of Java. It is used to persist data between Java object and relational database. JPA acts as a bridge between object-oriented domain models and relational database systems.

As JPA is just a specification, it doesn't perform any operation by itself. It requires an implementation. So, ORM tools like Hibernate, TopLink and iBatis implements JPA specifications for data persistence.

2 - What is the naming convention for finder methods in the Spring data repository interface?

Spring data JPA has its own naming conventions for methods. Following these conventions we can build sophisticated queries. These conventions are called also called as method name strategies. These strategies have defined set of keyword to use in method names. Based on the formed method name, method performs predefined operations.

For example: `findByAgeGreaterThan` is naming for query brings records age column is greater than the given value.

3 - What is PagingAndSortingRepository ?

Pagination is often helpful when we have a large dataset and we want to present it to the user in smaller chunks. Also, we often need to sort that data by some criteria while paging.

By having it extend `PagingAndSortingRepository`, we get `findAll(Pageable pageable)` and `findAll(Sort sort)` methods for paging and sorting.

Conversely, we could have chosen to extend `JpaRepository` instead, as it extends `PagingAndSortingRepository` too.

Once we extend `PagingAndSortingRepository`, we can add our own methods that take `Pageable` and `Sort` as parameters

4 - Differentiate between `findById()` and `getOne()` ?

- The `findById()` method is available in `CrudRepository` interface. The `getOne()` method is available in `JpaRepository` interface.
 - The `findById()` method will return null if the record doesn't exist in the database. The `getOne()` method throw `EntityNotFoundException` if the record doesn't exist in the database.
 - Calling `findById()` returns an eagerly fetched entity. Calling `getOne()` returns a lazily fetched entity.
 - The `findById()` methods return actual objects and entity fields will contain the value from the database. The `getOne()` returns a reference of the entity. All fields may contain default values
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5 - What is `@Query` used for ?

`@Query` is an annotation and used for executing custom sql queries.

6 - What is lazy loading in hibernate ?

Lazy Loading is a design pattern that we use to defer initialization of an object as long as it's possible. Hibernate applies lazy loading approach on entities and associations by providing a proxy implementation of classes.

Hibernate intercepts calls to an entity by substituting it with a proxy derived from an entity's class.

7 – What is SQL injection attack ? Is Hibernate open to SQL injection attack ?

SQL injection is a web security vulnerability that allows an attacker to interfere with the queries that an application makes to its database. It generally allows an attacker to view data that they are not normally able to retrieve. This might include data belonging to other users, or any other data that the application itself is able to access. In many cases, an attacker can modify or delete this data, causing persistent changes to the application's content or behavior.

In some situations, an attacker can escalate an SQL injection attack to compromise the underlying server or other back-end infrastructure, or perform a denial-of-service attack.

Hibernate does not grant immunity to SQL Injection, one can misuse the api as they please.

There is nothing special about HQL (Hibernates subset of SQL) that makes it any more or less susceptible.

Functions such as `createQuery(String query)` and `createSQLQuery(String query)` create a Query object that will be executed when the call to `commit()` is made. If the query string is tainted you have sql injection.

8 - What is criteria API in hibernate ?

Hibernate provides alternate ways of manipulating objects and in turn data available in RDBMS tables. One of the methods is Criteria API, which allows you to build up a criteria query object programmatically where you can apply filtration rules and logical conditions.

The Hibernate Session interface provides `createCriteria()` method, which can be used to create a Criteria object that returns instances of the persistence object's class when your application executes a criteria query.

9 - What Is Erlang? Why Is It Required For Rabbitmq ?

Erlang is a general-purpose programming language and runtime environment. Erlang has built-in support for concurrency, distribution and fault tolerance.

Erlang is requirement of rabbitmq since it is based on erlang.

10 – What is the JPQL ?

JPQL is Java Persistence Query Language defined in JPA specification. It is used to create queries against entities to store in a relational database. JPQL is developed based on SQL syntax. But it won't affect the database directly.

JPQL can retrieve information or data using SELECT clause, can do bulk updates using UPDATE clause and DELETE clause. EntityManager.createQuery() API will support for querying language.

11 – What are the steps to persist an entity object ?

- Creating an entity manager factory object
 - Obtaining an entity manager from factory
 - Initializing an entity manager
 - Persisting a data into relational database
 - Closing the transaction
 - Releasing the factory resources.
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12 – What are the different types of entity mapping ?

- one-to-one relationship
 - one-to-many or many-to-one relationship (dependent on the direction)
 - many-to-many relationship
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13 - What are the properties of an entity ?

An entity is an object that exists. It doesn't have to do anything; it just has to exist. In database administration, an entity can be a single thing, person, place, or object. Data can be stored about such entities. A design tool that allows database administrators to view the relationships between several entities is called the entity relationship diagram (ERD).

In database administration, only those things about which data will be captured or stored is considered an entity. If you aren't going to capture data about something, there's no point in creating an entity in a database.

14 - Difference between CrudRepository and JpaRepository in Spring Data JPA?

- JPA extend CrudRepository and PagingAndSorting repository. Crud Repository is the base interface and it acts as a marker interface.
- JPA also provides some extra methods related to JPA such as delete records in batch and flushing data directly to a database. CrudRepository provides only CRUD functions like findOne, saves, etc.
- JPA repository also extends the PagingAndSorting repository. It provides all the method for which are useful for implementing pagination. Crud Repository doesn't provide methods for implementing pagination and sorting.
- JpaRepository ties your repositories to the JPA persistence technology so it should be avoided. We should use CrudRepository or PagingAndSortingRepository depending on whether you need sorting and paging or not.
