**DIGITAL\_NURTURE4.0\_JAVA\_FSE**

**WEEK :3**

**Exercise 2: Difference Between JPA, Hibernate, and Spring Data JPA**

**✅ Java Persistence API (JPA)**

* JPA is a **specification** (JSR 338) that defines how Java objects are mapped to relational databases.
* It is **not an implementation** by itself.
* It provides annotations like @Entity, @Id, @OneToMany, etc., to define mappings.
* It abstracts out the persistence logic so developers don’t need to write boilerplate JDBC code.

**✅ Hibernate**

* Hibernate is a **concrete implementation** of the JPA specification.
* It is an ORM (Object Relational Mapping) tool that manages the mapping of Java classes to database tables.
* Developers can use either Hibernate’s native API or JPA annotations.
* It handles SQL generation, caching, dirty checking, lazy loading, etc.

**✅ Spring Data JPA**

* Spring Data JPA is a **Spring-based abstraction over JPA**.
* It **does not implement JPA** but works **on top of a JPA provider** (like Hibernate).
* It significantly reduces boilerplate code by providing ready-made repository interfaces like JpaRepository.
* Provides features like query method derivation, pagination, and built-in CRUD operations.