Difference between JPA, Hibernate, and Spring Data JPA

1. JPA (Java Persistence API)

- JPA is a specification (defined in JSR 338).

- It provides a set of interfaces and rules for object-relational mapping (ORM).

- JPA does not provide an implementation—it needs a provider.

2. Hibernate

- Hibernate is a popular implementation of the JPA specification.

- It is a full-featured ORM tool.

- Hibernate provides:

    - Entity management

    - Caching

    - Lazy loading

    - Query capabilities with HQL and Criteria API

- Hibernate can be used with or without JPA.

3. Spring Data JPA

- Spring Data JPA is a Spring-based abstraction over JPA.

- It reduces boilerplate code and simplifies working with databases.

- Uses JpaRepository, CrudRepository, etc.

- Automatically implements queries based on method naming conventions.

- Internally uses JPA provider (e.g., Hibernate) to perform actual ORM tasks.