**Difference between JPA, Hibernate, and Spring Data JPA**

**Java Persistence API (JPA)**

* JPA is a **Java specification (JSR 338)** that standardizes how to manage relational data using Java objects.
* It defines how Java objects are mapped to database tables and how data can be stored, retrieved, and manipulated.
* JPA **does not provide implementation**, but frameworks like Hibernate implement the JPA specification.

**Hibernate Framework**

* Hibernate is a **popular ORM (Object-Relational Mapping) tool** for Java.
* It acts as a **JPA provider** by offering a concrete implementation of the JPA specification.
* Hibernate simplifies database interaction by mapping Java classes to database tables and handles database operations using Java objects.
* It offers additional features beyond JPA, like caching, lazy loading, etc.

**Spring Data JPA**

* Spring Data JPA is a **part of the Spring ecosystem** that adds an abstraction layer on top of the JPA provider (like Hibernate).
* It simplifies the creation of repository classes and reduces boilerplate code required for database access.
* It **is not a JPA implementation** but works **on top of an existing JPA provider**.
* Developers can use JpaRepository interfaces with custom query methods without writing actual SQL or HQL.

**Using Hibernate:**

public Integer addEmployee(Employee employee){

Session session = factory.openSession();

Transaction tx = null;

Integer employeeID = null;

try {

tx = session.beginTransaction();

employeeID = (Integer) session.save(employee);

tx.commit();

} catch (HibernateException e) {

if (tx != null) tx.rollback();

e.printStackTrace();

} finally {

session.close();

}

return employeeID;

}

**Using Spring data JPA:**

**EmployeeRepository.java**

public interface EmployeeRepository extends JpaRepository<Employee, Integer> {

}

**EmployeeService.java:**

@Autowired

private EmployeeRepository employeeRepository;

@Transactional

public void addEmployee(Employee employee) {

employeeRepository.save(employee);

}