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

**1. JPA (Java Persistence API)**

- JPA is a specification (JSR 338) for persisting, reading, and managing data from Java objects.

- It does not provide any concrete implementation.

- It defines how Java objects and relational data should interact.

- Hibernate is one of the most commonly used implementations of the JPA specification.

**2. Hibernate**

- Hibernate is an Object Relational Mapping (ORM) tool.

- It provides a concrete implementation of the JPA specification.

- It allows developers to map Java classes to database tables using annotations or XML configuration.

**3. Spring Data JPA**

- Spring Data JPA does not provide a JPA implementation itself.

- It works as an abstraction over JPA providers like Hibernate.

- It significantly reduces boilerplate code by providing ready-to-use interfaces like JpaRepository.

- It manages transaction boundaries and integrates smoothly with the Spring ecosystem.

- Developers don’t need to write common CRUD operations explicitly.

**4. Code Comparison:**

Hibernate Approach:

/\* Method to CREATE an employee in the database \*/

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;

}

Spring Data JPA Approach:

**EmployeeRepository.java**

public interface EmployeeRepository extends JpaRepository<Employee, Integer> {

}

**EmployeeService.java**

@Autowired

private EmployeeRepository employeeRepository;

@Transactional

public void addEmployee(Employee employee) {

employeeRepository.save(employee);

}

**Conclusion:**

- JPA defines the standard.

- Hibernate implements the standard.

- Spring Data JPA simplifies working with JPA implementations like Hibernate by reducing boilerplate code.