Week3_5_ Spring Data JPA with Spring Boot, Hibernate_. spring-data-jpa-handson_ Difference between JPA, Hibernate and Spring Data JPA

Feature	JPA (Java Persistence API)	Hibernate	Spring Data JPA
Type	Specification (API only)	ORM framework & JPA implementation	Abstraction layer over JPA with repository support
Ownership	Jakarta EE (formerly Oracle/Java EE)	Red Hat	Spring Framework (Pivotal)
Level	Low-level API	Low-to-mid level ORM	High-level abstraction
Core API	EntityManager, EntityTransaction, Query	Session, Transaction, Query, CriteriaBuilder	JpaRepository, CrudRepository, PagingAndSortingRepository
Setup Complexity	Manual setup required	Requires configuration but has helpers	Simplified via Spring Boot autoconfiguration
Query Support	JPQL, Criteria API	JPQL, HQL, Criteria API, native SQL	JPQL, Native SQL, Method name queries, @Query annotation
Entity Management	Manual creation and management via EntityManager	Automatic with additional convenience APIs	Fully abstracted; no need to call EntityManager explicitly
Transactions	Explicitly managed	Declarative or programmatic	Integrated with Spring's @Transactional
Pagination & Sorting	Needs to be manually handled	Custom logic or utility methods required	Built-in via Pageable and Sort interfaces
Caching	No caching support	1st and 2nd level cache support	Delegates to JPA provider (e.g., Hibernate caching)
Criteria API Support	Yes	Yes	Inherited from JPA or custom
Auditing Support	No	Needs manual implementation or 3rd party	Built-in auditing via @CreatedDate, @LastModifiedDate
Boilerplate Code	High – needs explicit DAO classes and logic	Medium – some utilities but still verbose	Very low – just extend interfaces
Use Case Suitability	Good for full control, custom ORM logic	Great when using custom ORM + extra features	Best for rapid CRUD and data-centric app development
Learning Curve	Moderate – requires understanding of persistence lifecycle	Moderate to steep – many advanced features	Easy – especially with Spring Boot
Integration with Spring Boot	Manual setup	Manual or via Spring Boot starter	Seamless with Spring Boot

Feature	JPA (Java Persistence API)	Hibernate	Spring Data JPA
Popularity	Widely used as the base standard	Most popular implementation of JPA	Popular within Spring ecosystem