**All 3 are interfaces provided by Spring Data to simplify database operations — but they have different features.**

**✅ 1. CrudRepository<T, ID>**

🧠 **Basic CRUD operations** (Create, Read, Update, Delete)

java

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public interface UserRepository extends CrudRepository<User, Long> {

}

**✨ Methods it gives you:**

java

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save(), findById(), findAll(), deleteById(), count()

✅ Use when you only need **basic data operations**.

**✅ 2. PagingAndSortingRepository<T, ID>**

🧠 **Extends CrudRepository** and adds support for:

* **Pagination**
* **Sorting**

java

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public interface UserRepository extends PagingAndSortingRepository<User, Long> {

}

**✨ Extra methods:**

java

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findAll(Sort sort)

findAll(Pageable pageable)

✅ Use when you want to show paginated lists or sorted results.

**✅ 3. JpaRepository<T, ID>**

🧠 **Extends PagingAndSortingRepository** and adds **JPA-specific methods**.

java

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public interface UserRepository extends JpaRepository<User, Long> {

}

**✨ Extra powerful methods:**

java

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flush()

saveAndFlush()

deleteInBatch()

findAllById()

✅ Best choice for **full power** of Spring Data JPA with pagination, sorting, batch operations, etc.

**🧾 Summary Table**

| **Feature** | **CrudRepository** | **PagingAndSortingRepository** | **JpaRepository** |
| --- | --- | --- | --- |
| Basic CRUD | ✅ | ✅ | ✅ |
| Pagination & Sorting | ❌ | ✅ | ✅ |
| JPA-Specific Features | ❌ | ❌ | ✅ |
| Batch Operations | ❌ | ❌ | ✅ |
| Best Used For | Simple CRUD | Paginated Lists | Full-featured JPA |