Lab 01 (Solution) -: Understanding ORM with a Retail Inventory System

1. **What is ORM?**

* ORM (Object-Relational Mapping) is a technique that lets you interact with a relational database using objects in your programming language (e.g., C#) instead of writing raw SQL queries.
* **In EF Core:**

1. Each C# class maps to a **database table**.
2. Each property of a class maps to a **column**.
3. Relationships like one-to-many or many-to-many are expressed via **navigation properties**.

* **Benefits of ORM:**

1. **Productivity** – Write less SQL manually.
2. **Maintainability** – Changes in code reflect in the database with migrations.
3. **Abstraction** – You work with C# objects, and EF Core generates SQL behind the scenes.
4. **EF Core vs EF Framework**

| **Feature** | **EF Core** | **EF Framework (EF6)** |
| --- | --- | --- |
| Platform Support | Cross-platform | Windows-only |
| Performance | Lightweight and fast | Heavier, slower |
| LINQ and Async Support | Full support | Limited async support |
| Compiled Queries | Supported | Not supported |
| Bulk Operations | Improved support | Very limited |
| Migration Support | Yes | Yes |
| Maturity | Newer, still evolving | Older and stable |
| Best for New Projects | Yes | No (used in legacy apps) |

1. **EF Core 8.0 Features**

Entity Framework Core 8.0 introduces several new features that enhance the performance and capabilities of data access in .NET applications.

**Key Features**

**JSON Column Mapping**

EF Core 8.0 allows direct mapping of C# classes to JSON columns in relational databases, enabling better handling of semi-structured data.

**Compiled Models**

Improves startup performance by precompiling the model and avoiding runtime model building. Useful for large applications.

**Interceptors Enhancements**

Interceptors can now handle more lifecycle events such as query execution and save operations, which makes it easier to add cross-cutting concerns like logging and auditing.

**Improved Bulk Operations**

Support for efficient bulk insert, update, and delete operations is improved, reducing the need for custom SQL or third-party libraries.

These features make EF Core 8.0 a powerful and modern ORM choice for .NET applications.

1. **Create a .NET Console App**

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1. **Install EF Core Packages**

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