Lab 1: Understanding ORM with a Retail Inventory System

**What is ORM?**

**Explain how ORM maps C# classes to database tables.**

Object-Relational Mapping (ORM) is a technique that allows developers to interact with a relational database using object-oriented programming concepts. In C#, popular ORM tools like Entity Framework (EF) handle this mapping automatically.

ORM bridges the object-oriented world of C# and the relational world of SQL databases.

|  |  |
| --- | --- |
| C# | SQL Database |
| Class | Table |
| Property | Column |
| Object Instance | Row |
| Data Type | Column Type |
| Navigation Property | Foreign Key / Relationship |

**Benefits: Productivity, maintainability, and abstraction from SQL.**

**1. Productivity**

* Eliminates manual SQL writing for most operations (CRUD)
* Auto-generates SQL queries from LINQ expressions
* Speeds up development with code-first or database-first approaches

**2. Maintainability**

* Centralizes data logic in C# classes
* Schema changes in models can be managed via migrations
* Easier to refactor as application grows

**3. Abstraction from SQL**

* Developers work with familiar C# objects instead of writing raw SQL
* Reduces chances of SQL injection (when using parameterized queries)
* LINQ provides compile-time syntax checking and IntelliSense