1. Introduction

In today's digital era, E-commerce platforms play a vital role in facilitating online shopping experiences. This project involves designing and implementing a **relational database management system (RDBMS)** for an E-commerce platform, aimed at managing customers, products, orders, and payments effectively.

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2. Abstract

This project demonstrates how to structure and manage data for a basic E-commerce system using relational database principles. It includes the identification of entities, ER diagram design, schema normalization (up to 3NF), SQL DDL script writing, data insertion, and the creation of views and JOIN queries for sales reports. The system provides a simplified yet scalable backend solution that supports efficient transaction handling and reporting.

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3. Tools Used

- **DBMS**: PostgreSQL
- **Diagram Tool**: dbdiagram.io
- **Editor**: pgAdmin / DBeaver / SQL Shell (psql)
- **Scripting Language**: SQL (DDL, DML, DQL)

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4. Steps Involved in Building the Project

1. **Requirement Analysis**: Identified key entities — Products, Customers, Orders, OrderItems, and Payments.
2. **ER Diagram Design**: Created a relational schema and entity relationships using dbdiagram.io.
3. **Normalization**: Ensured all tables were in **Third Normal Form (3NF)** for eliminating redundancy.
4. **Database Creation**:
    - Defined tables using CREATE TABLE statements with appropriate primary and foreign key constraints.
    - Populated tables with sample data using INSERT INTO.
5. **Queries & Views**:
    - Executed JOIN queries for customer spending and product sales.
    - Created a view ProductSalesReport for reusable reporting.
6. **Indexing**: (Optional) Implemented indexes for performance optimization on foreign key columns.

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5. Conclusion

The project successfully demonstrates the process of building a normalized, relational database for an E-commerce system. It provides a robust structure for handling business operations like product inventory, order processing, and payment tracking. The use of views and joins makes report generation efficient and modular. This project lays a strong foundation for future enhancements such as adding categories, shipping, user authentication, and analytics.