Zomato SQL Database Project Report

Name: **Mohammad Gaznavi Sheikh**
Degree: **B.E. Computer Science**
Project Title: **Zomato Database Management System using SQL**

➢ Abstract

The rapid growth of online food delivery platforms has increased the need for well-structured and efficient database systems to manage large volumes of data. This project presents the design and implementation of a relational database system for a Zomato-like food delivery application using SQL. The database is designed to store and manage information related to customers, restaurants, menus, orders, payments, deliveries, and reviews in a structured and organized manner.

The project emphasizes proper database design principles, including normalization, primary and foreign key relationships, and the use of constraints to ensure data integrity and consistency. Multiple one-to-one and one-to-many relationships are implemented to accurately represent real-world business scenarios such as order placement, payment processing, and delivery assignment. Sample datasets are inserted to simulate real-time operations and validate the correctness of relationships.

Additionally, various SQL queries are executed to retrieve meaningful insights from the database, demonstrating effective data retrieval and manipulation techniques. This project enhances practical understanding of relational database concepts and showcases the application of SQL in building a scalable and reliable backend data model for real-world applications like online food delivery systems.

➢ Introduction

The increasing use of digital platforms for food ordering and delivery has transformed the way customers interact with restaurants. Applications like Zomato handle thousands of daily transactions, making efficient data management a critical requirement. A well-designed database plays a key role in ensuring smooth operations such as order placement, menu management, customer registration, payment processing, and delivery tracking.

This project focuses on developing a structured database model that supports the core functionalities of an online food delivery system. The database is designed to logically organize data into multiple related tables, reducing redundancy and improving data accuracy. Each entity in the system, such as customers, restaurants, menus, and orders, is represented separately while maintaining meaningful relationships between them.

By implementing this project, important database concepts such as entity relationships, constraints, and referential integrity are applied to a practical use case. The project also highlights how structured query language (SQL) can be effectively used to perform operations like inserting data, updating records, and retrieving information required for business decision-making. Overall, this project provides a foundational understanding of how backend database systems support large-scale real-world applications.

➢ Objectives

- To design a structured and scalable database model suitable for an online food delivery application.
- To organize data efficiently across multiple entities such as customers, restaurants, menus, orders, and payments.
- To ensure data accuracy and consistency by applying appropriate constraints and validation rules.
- To perform data insertion, updating, and deletion operations using SQL.
- To retrieve meaningful information using SQL queries involving joins, filtering, and aggregation.
- To understand real-world database relationships and their implementation in a relational database system.
- To develop practical experience in handling interconnected data across multiple tables.

➢ Tools & Technologies

- Oracle SQL / MySQL
- SQL
- Git & GitHub
- Draw.io (ER Diagram)

➢ Database Design

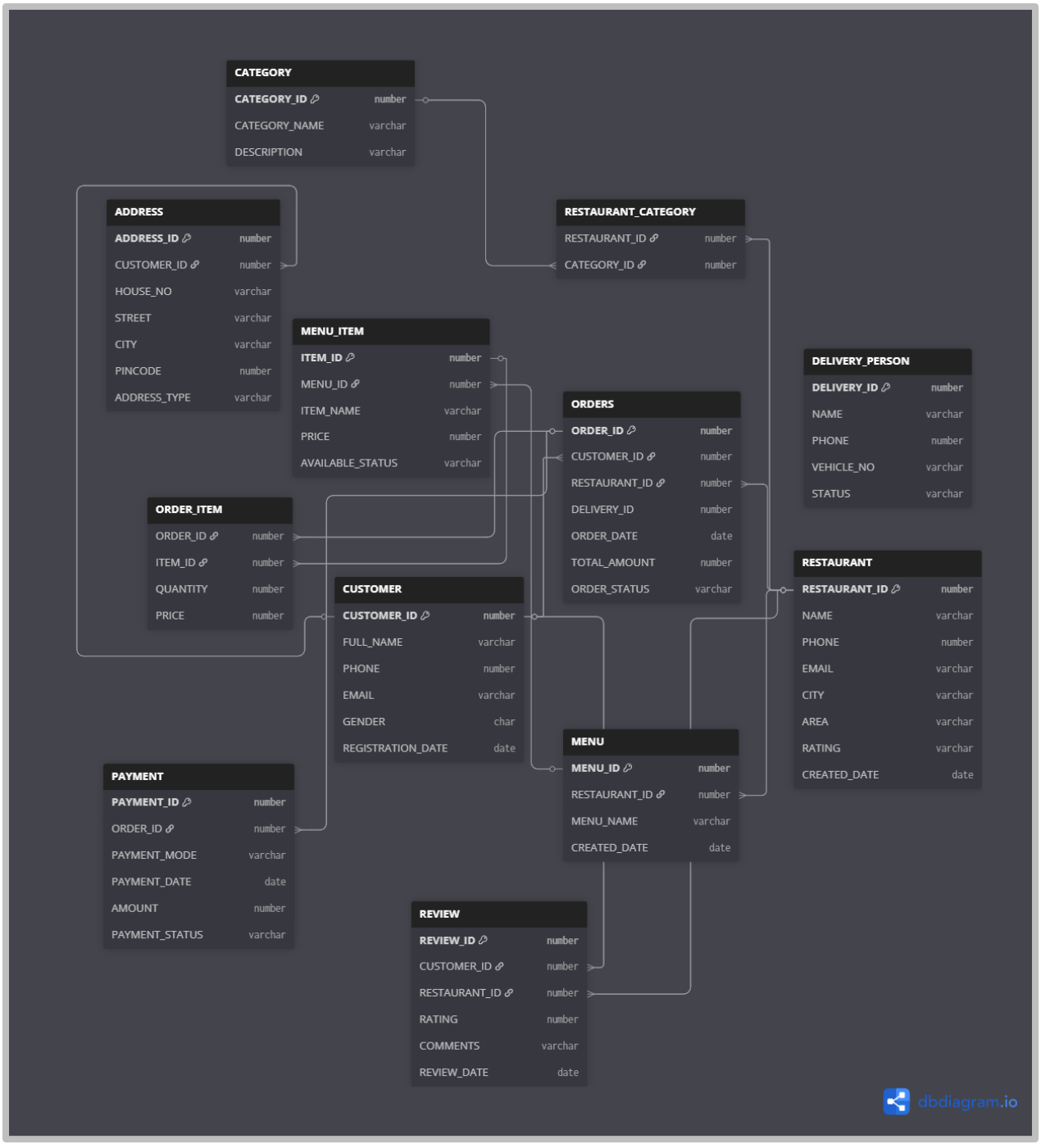
The database is designed using a modular approach where each table represents a specific entity with a clearly defined purpose. Attributes are carefully selected to capture essential details while avoiding unnecessary duplication of data. This structure helps improve data organization and simplifies maintenance.

Relationships between tables are established using foreign keys to reflect real-world dependencies between entities. These relationships ensure that related records remain consistent across the database. Constraints such as NOT NULL, UNIQUE, CHECK, and DEFAULT are applied to enforce business rules and validate data at the database level.

The design follows normalization principles to minimize redundancy and improve data integrity. By separating data into logically related tables, the database supports efficient data storage and flexible query execution. This design also allows easy extension of the system in the future, such as adding new features or entities without major changes to the existing structure.

➢ ER Diagram

The ER diagram represents the relationships between entities using primary and foreign keys, ensuring data consistency.



➢ SQL Queries

A wide range of SQL queries are implemented to interact with the database and analyze stored data effectively. These queries support day-to-day operations such as viewing customer details, tracking orders, calculating total order values, and checking payment and delivery statuses. Parameterized queries are used to filter records based on specific conditions like date, status, or customer information.

Advanced query techniques are applied to handle complex data retrieval across multiple related tables. Aggregation functions are used to generate summaries such as total sales per restaurant, number of orders per customer, and average ratings. Conditional expressions help derive meaningful results from raw data, improving the usefulness of query outputs.

The queries are optimized for clarity and correctness, following best practices in SQL writing. This section demonstrates the ability to transform stored data into actionable information, which is essential for reporting, analysis, and decision-making in real-world database-driven applications.

➢ Conclusion

This project successfully demonstrates the practical implementation of a relational database system for an online food delivery platform. It provided hands-on experience in designing structured tables, establishing proper relationships, and enforcing constraints to maintain data integrity. By working on this project, skills in handling complex datasets and performing efficient data retrieval using SQL were significantly enhanced.

Furthermore, the project emphasizes the importance of logical database organization, which ensures scalability and easy maintenance for future development. The integration of multiple entities, such as customers, restaurants, orders, payments, and deliveries, allowed for a realistic simulation of business processes. Overall, this project not only strengthened technical skills in SQL and database management but also fostered a better understanding of how backend databases support real-world applications efficiently and reliably.

➢ Future Enhancements

- Add stored procedures to automate repetitive database tasks.
- Implement triggers to maintain data integrity and automate actions.
- Integrate the database with backend applications for a complete system.
- Introduce role-based access control to improve security.
- Optimize performance using indexing and query optimization.