Assignment 3.2

Working with Databases (MySQL)

Delivrables 1:

- MySQL Cheat Sheet

1. Relational Database Management System (RDBMS):
   - MySQL is a popular open-source relational database management system.
   - It organizes data into tables with rows and columns, enforcing data integrity and relationships.

2. SQL (Structured Query Language):
   - SQL is the standard language for interacting with MySQL databases.
   - It enables users to perform various operations like querying, inserting, updating and deleting data.

3. Tables:
   - Tables are the fundamental structure in MySQL databases, representing entities.
   - Each table consist of rows (records) and columns (fields) defining the data structure.

4. Data Types:

- MySQL supports various data types such as INT, VARCHAR, TEXT, DATE and more.
- Data types define the kind of data that can be stored in a column, ensuring data integrity and efficient storage.

5. Primary Keys:

- Primary Keys uniquely identify each record in a table.
- They enforce entity integrity and are often defined as auto-incrementing integers.

6. Foreign Keys:

- Foreign Keys establish relationships between tables, enforcing referential integrity.
- They ensure that data in one table corresponds to data in another table, maintaining data

7. Indexes:

- Indexes improve query performance by facilitating fast data retrieval.
- They are created on columns to speed up search and retrieval operations, especially for large datasets.

8. Normalization

- Normalization is the process of organizing data to minimize redundancy and dependency.
- It reduces data duplication and improve data integrity, leading to more efficient database structures.

9. Transactions:

- Transactions ensure the atomicity, consistency, isolation and durability of database operations.
- They allow multiple operations to be treated as a single unit, ensuring data integrity and reliability.

10. Views:

- Views are virtual tables derived from one or more underlying tables
- They provide a customized perspective of the data, simplifying complex queries and enhancing security.

11. Stored Procedures:

- Stored procedures are precompiled SQL statements stored in the database.
- They encapsulate business logic and can be invoked by applications, improving performance and security.

12. Triggers:

- Triggers are database objects that automatically execute in response to specified events.
- They are used to enforce business rule, maintain data integrity and automate repetitive tasks.

13. Security:

- MySQL offers various security features such as user authentication, access control, and encryption.
- Proper security measures should be implemented to protect sensitive data and prevent unauthorized access.

14. Backup and Recovery:

- Regular backups are essential to safeguard data against loss or corruption.
- MySQL provides tools for backup and recovery, including mysqldump and binary log backups.

15 Performance Optimization:

- Performance tuning techniques like query optimization, indexing, and caching enhancing MySQL database performance.
- Monitoring tools help identify bottlenecks and optimize resource utilization for improved efficiency.