**Reflection and Summary of Database Course Experiments**

Zhou Meitong CS2

2023010210

During the process of completing the database course experiments (Weeks 01 - 05), I have gone through a complete process from learning the basic knowledge of databases to actual operations and project construction, and have gained a lot. At the same time, I have also realized my strengths and weaknesses in many aspects. The following is a detailed reflection and summary of the entire experimental process.

1. **Mastery of Knowledge and Skills**

1.Through research and learning on concepts such as data, metadata, databases, DBMS, and data privacy, I have a relatively clear understanding of the basic concepts in the field of databases. The mastery of these basic concepts provides a solid theoretical foundation for further in-depth learning and practice.

2.Learning in areas such as the relational data model, entity-relationship modeling, and normalization theory (such as UNF, 1NF, 2NF, 3NF) has enabled me to understand how to build a reasonable and efficient database structure, identify various relationships and dependencies in the data, and use normalization principles to optimize database design and reduce data redundancy and anomalies.

3.My SQL programming ability has been significantly improved. From the initial simple database creation (using DDL commands) and data insertion (DML commands) to complex query operations (involving various condition filtering, function usage, multi-table joins, etc.), I have gradually mastered the basic syntax and common operations of the SQL language and can write effective SQL statements according to specific requirements to manage and analyze data.

4.My database design ability has improved to a certain extent. By drawing ER diagrams to represent entity relationships, I have learned to abstract data models from actual business scenarios, determine entities, attributes, relationships, and constraints, which helps me design a clear-structured and logically rigorous database architecture and improve the integrity and consistency of data.

**II. Advantages in the Process of Completing the Assignment**

In group tasks, I actively communicate and exchange ideas and research results with team members. For example, when discussing ER diagram design and the normalization process, everyone expresses their opinions and jointly analyzes the advantages and disadvantages of different solutions, and finally reaches a consensus. This kind of teamwork not only improves work efficiency but also broadens my thinking and allows me to view problems from different perspectives.

When encountering problems, I can actively consult materials, refer to relevant tutorials, and try multiple methods to solve them. For example, when encountering syntax errors or unexpected results in writing complex SQL query statements, I will carefully check the statement structure, function usage, compare sample codes, and gradually troubleshoot the problems until the expected function is successfully implemented. This positive and proactive attitude in solving problems enables me to remain calm in the face of difficulties and constantly explore solutions, thereby improving my problem-solving ability.

**III. Difficulties Encountered and Solutions**

**(I) Understanding of Theoretical Knowledge**

Through research and learning on concepts such as data, metadata, databases, DBMS, and data privacy, I have a relatively clear understanding of the basic concepts in the field of databases. The mastery of these basic concepts provides a solid theoretical foundation for further in-depth learning and practice.

Solution:Learning in areas such as the relational data model, entity-relationship modeling, and normalization theory has enabled me to understand how to build a reasonable and efficient database structure, identify various relationships and dependencies in the data, and use normalization principles to optimize database design and reduce data redundancy and anomalies.

**(II) Improvement of Practical Skills**

My SQL programming ability has been significantly improved. From the initial simple database creation and data insertion to complex query operations, I have gradually mastered the basic syntax and common operations of the SQL language and can write effective SQL statements according to specific requirements to manage and analyze data.

Solution:My database design ability has improved to a certain extent. By drawing ER diagrams to represent entity relationships, I have learned to abstract data models from actual business scenarios, determine entities, attributes, relationships, and constraints, which helps me design a clear-structured and logically rigorous database architecture and improve the integrity and consistency of data.

**(III) Maintenance of Data Integrity and Consistency**

During data insertion and update operations, sometimes problems such as foreign key constraints and data format mismatches cause operation failures, affecting the integrity and consistency of data.  
Solution: Strengthen the understanding of data integrity rules and constraints, and carefully check the legality and relevance of data before operations. For foreign key constraint problems, ensure that the inserted or updated data has corresponding records in the associated table; for data format problems, unify the data format and conduct strict data verification to avoid illegal data from entering the database.

**IV. Future Learning Plan**

In order to achieve further development in the field of databases, I will improve my abilities in multiple aspects. On the one hand, I will further study the principles of databases in depth, covering advanced topics such as distributed databases, data warehouses, and data mining, so as to broaden my knowledge and gain a deep understanding of the application and development trends of database technology in different fields, laying a solid theoretical foundation for handling complex database projects in the future. On the other hand, I will continue to strengthen the training of SQL programming ability, learn more advanced SQL features and functions, and master database programming technologies such as stored procedures and triggers in depth, so as to handle complex data operations and business logic more flexibly. At the same time, I will learn to use the advanced functions of database management tools such as MySQL to improve the efficiency of database design, development, and management. In addition, I will actively participate in the actual development of database projects, accumulate experience in practice, enhance the ability to solve practical problems, apply the learned knowledge to actual work, and continuously optimize my database design and development skills.

**V. Summary**

Through these five weeks of database course experiments, I have made great progress in knowledge and skills, and have also been trained in problem-solving and teamwork. In future learning and work, I will continue to work hard, constantly improve my ability level in the field of databases, actively explore the innovative application of database technology, and contribute my own strength to the development of database technology.