Principles of Database Systems

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Main Contents

In this course, we will learn the basic concepts, principles and applications of database systems, especially the relational database systems. The contents mainly include :

- The data models, SQL language and user interfaces
- Key principles of DBMS (mainly architecture, query optimization, concurrency control, recovery, etc.)
- The security and integrity constrains of database
- Introduction of distributed database systems
- Some new research and application fields of database technology, such as data warehouse, data mining, XML data management, etc.

References

1) Wang Nengbin, "Textbook of Database Systems"
2) Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems" , 3rd Edition, McGraw-Hill Companies, 2002
3) Hector Garcia-Molina, Jeffrey.D.Ullman, "Database Systems: the Complete Book"
4) C.J.Date, "An Introduction to Database Systems"
5) Web Site of our course:

   http://cselab.seu.edu.cn/course/dbprinciple/

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1. **Introduction**

   The history, classification, and main research contents of database systems; The database system; the concepts of data model

2. **Data Model***

   Hierarchical and network model; Relational model; ER model; Object-Oriented model and other data models

3. **User Interfaces and SQL Language***

   User interface; SQL language, including QL, DDL, DCL, DML, view, embedded SQL and dynamic SQL, etc.

4. **Database Management Systems***

   The architecture of database systems, query optimization, file structure and index, transaction management, concurrency control, recovery mechanism

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5. **The Security and Integrity Constrain**

   The security model of database system; Integrity constrain and its expression, implementing method, assertion, trigger

6. **Database Design***

   Design procedure; ER graph; Normalization of Relational Schema

7. **Distributed Database Systems**

   What and Why DDBS, data distribution, distributed database design; Query optimization, distributed transaction management in DDBMS

8. **New Research and Application Fields**

   Data warehouse, OLAP; Data mining; XML data management