IT3292E Database

Class Information

Class: ICT-K68(161351)
Time: 16:00-17:30, Tuesday
Location: D9-402

Instructor: Vũ Tuyết Trinh
School of Information Technology and Communication
Hanoi University of Science and Technology
Email: trinhvt@soict.hust.edu.vn

Description

Database is a collection of data which is intended to be shared by users and applications. DBMS (Database Management System) is a computer system which enables to handle this collection of data efficiently. In this course, topics such as purposes and roles of database, the relational model as a data representation method, the SQL language to manipulate stored data, database design methods to handle data efficiently, transaction management which enables data sharing by users and applications, architecture of DBMS to process huge datasets, recent trends and future directions will be introduced.

- Students can explain purposes and roles of database in information systems.
- Students can make programs to manipulate data with SQL.
- Students can explain important concepts on database design such as normalization and integrity constraints.
- Students can explain basic methods for transaction management, such as concurrency control and fault recovery
- Students can explain the basic structure of DBMS, such as index management and query processing.

Grading

- Midterm exam: 50%
  2-3 tests/assignment (both computer-based and written exam)
- Final exam: 50% (MCQ)

Text and Reading

1. Raghu Ramakrishnan, Johannes Gehrke. Database Management Systems (3rd edition). 2003. McGraw-Hill
2. C. J. Date. An introduction to database systems (8th edition). 2004. Pearson/Addison-Wesley

3. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom. Database systems : the complete book (2nd edition). 2008. Prentice Hall
4. R. Elmasri and S. Navathe. Fundamentals of Database Systems. 2004 (4th edition). Addison-Wesley.
5. Nguyễn Kim Anh. Nguyên lý của các hệ cơ sở dữ liệu. 2004. Nhà xuất bản Đại học Quốc Gia Hà Nội.

Useful website/resources

- Online course by Jennifer Widom (Stanford University) : Databases: Introduction to Relational Databases at https://www.edx.org/course/databases-5-sql, especially the following parts
  - Databases: Relational Databases and SQL
  - Databases: Advanced Topics in SQL (prerequisite: Relational Databases and SQL)
  - Databases: Modeling and Theory
  - others parts may be skipped until end of this class
- others will be provided during the class

Tentative Plan

Week	Topics	Materials
2 16/9	Introduction to Database Relational DB	slides1_Introduction.pdf
3 23/9	Relational Database Language SQL	slides2_SQL(part1).pdf
4 30/9	SQL (cont.) Exercise	slides3_SQL(part2).pdf
5 7/10	SQL (cont.) Exercise	
6 14/10	Conceptual Design with ER Model	slides5_ER-class.pdf
7 21/10	**Exercises (SQL): Correction & Discussion**	
8 28/10	**Test 1**	
9 4/11	Database Design: bottom-up approach Functional Dependency	slides6_Functional_Dependency
10 11/11	**SEMESTER BREAK**	
11 18/11	Normal Forms & Normalization Exercises	slides6_Normalization
12 25/11	Index Management	slides7_Storage
13 2/12	**Exercises (Design): Correction & Discussion**	
14 9/12	Query Processing (relational algebra) Exercises	slides8_QueryProcessing
15 16/12	**Test 2**	
16 23/12	Contraints & triggers Security	slides9_Constraints_Triggers
17 30/12	Transaction	
18 6/1	Review	
19 13/1	**Exercises: review & discussion**	
	FINAL EXAM (schedule TBD)	