데이터베이스
(Databases)

소프트웨어학과
김응모 교수

Why Databases?

- Databases in Real Life
  - Banking
  - Airlines
  - Universities
  - Libraries
  - Sales
  - Credit Cards
  - GIS
  - CRM
  - SNS
  - . . . . . .
- Databases touch all aspects of our lives. They give us useful and valuable information.
- Database is essential for constructing every application software.

History of Databases

- Early 1960s
  - File Systems

- Late 1960s and 1970s:
  - Hierarchical model : IMS(IBM)
  - Network model : IDS(Bachman(GE))
  - Relational model : Codd (IBM, Turing Award), System R prototype

- 1980s:
  - Commercial RDBMS; Oracle, DB2, SQL Server, . .
  - QBE, QUEL, SQL; SQL becomes industrial standard later.
  - Object-Oriented DB, Object-Relational DB

- 1990 - 2000s:
  - Decision Support, Data Warehouse, and Data Mining, XML, . . .

- Recent
  - NoSQL: Big Data

Study Goals

- What is **database system**?
- How to **design good database**?
- What is **relational database**?
- What is **DBMS**?
- Database Programming : **SQL**
- Practice to **build databases**

What To Learn : By Subjects

- **Introduction**
  - Database Systems

- **Database Modeling and Design**
  - Entity Relationship (ER) Model
  - Mapping : ER to Relational
  - Normalization
  - Relational Database Design

- **Relational Databases and Query**
  - Relational Model
  - Relational Algebra
  - SQL

- **Database Systems Issues**
  - Storing Database
  - File Systems
  - Transaction Control

What To Learn : By Chapters (1)

- Database System Concept
  - Databases: Properties
  - Database Management Systems(DBMS)
  - Data Independence

- Entity Relationship(ER) Model
  - ER Modeling
  - EER Modeling

- Relational Model
  - Relations: Structures, Properties
  - Concepts of Keys
  - Entity Integrity, Referential Integrity

- Relational Algebra
  - Relational Operators: Selection, Projection, Join, Division, etc.
  - Constructing Relational Algebra Query

What To Learn : By Chapters (2)

- Constructing Relations by ER to Relational
  - Mapping ER to Relations

- SQL
  - Create Tables from relations
  - Constructing SQL Queries
  - Views

- Normalization
  - Criteria for Good Relations
  - Functional Dependency
  - Normal Forms

- Relational Database Design
  - Lossless Join
  - Decomposing relations

What To Learn : By Chapters (3)

- Storing Databases
  - Hard Disk Storages
  - Storing Tables
  - Basic Files

- Indexing Files
  - Concepts of Indexing
  - Basic Indexing Files
  - B Tree, B+ Tree

- Transaction Management
  - ACID Properties
  - Serializable Schedules

- Textbook
  Fundamentals of Database Systems,
  by Elmasri and Navathe, (Addison Wesley)

- 강의노트/공지사항/연습문제
  - www.icampus.ac.kr "강의콘텐츠" 참조
  - 강의노트는 매주 upload함
  - 4 개의 연습문제 : 제출 불필요
  - 공지사항, 연습문제 등은 " 주차별 공지사항" 참조
  - 강의내용 관련 질문 사항은 " 문의 게시판" 에 올릴 것

- Grading
  - 중간시험: 8주차에 시행
  - 기말시험: 16주차에 시행
  - 출석

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