Welcome to the class of CS219 (Fall 2020)

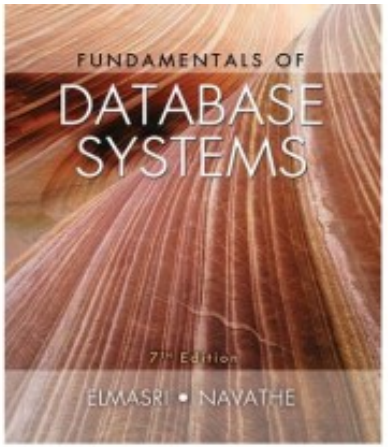
Week 01

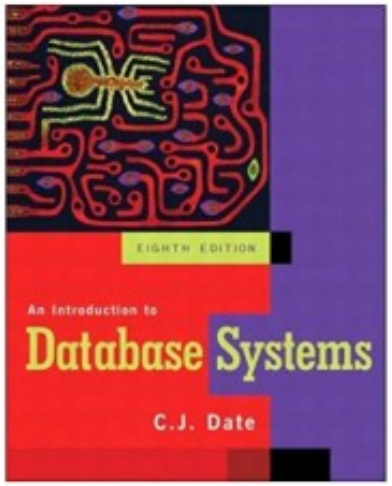
Introduction

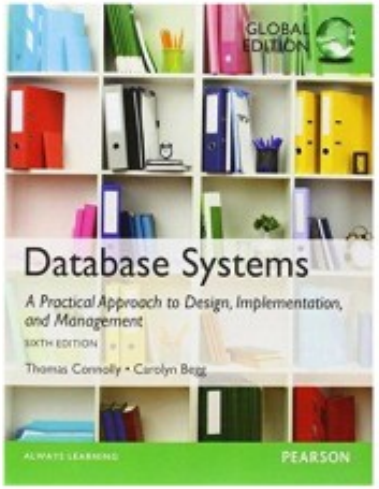
31st-Aug-2020

Course Information

- Prerequisite: CS-201 Data Structures
- Text Book
  - Ramez Elmasri & Shamkant B. Navathe, *Database Systems, Models, Languages, Design and Application Programming*, 7th Edition, 2016.
- Reference Books
  - Thomas Connolly, Carolyn Begg, *Database Systems: A practical approach to design, implementation and Management*, 6th Edition, 2015
  - C.J. Date, *An Introduction to Database Systems*, 8th Edition, 2004







Tentative Course Outline

Week 1	Chapter No. 1 Introduction, Characteristics of Database Approach, Files Vs. Databases, Characteristics of Database approach, Advantages of using DBMS, When not to use DBMS.
Week 2	Chapter No. 2 Data Model, Schema and Instance, three schema architecture and data independence, classification of DBMS, database languages & Interfaces, Database systems environment. Relational Model Concepts, Relational Model
Week 3	Chapter No. 5 Constraints and Relational Database Schemas, Update Operations, Transactions, and Dealing with Constraint Violations SQL Data Definition and Data Types Specifying Constraints in SQL Basic Retrieval Queries in SQL
Week 4	Chapter No. 6 INSERT, DELETE, and UPDATE Statements in SQL Additional Features of SQL
Week 5	Chapter No. 7 More Complex SQL Retrieval Queries Specifying Constraints as Assertions and Actions as Triggers Views (Virtual Tables) in SQL Schema Change Statements in SQL

Tentative Course Outline

Week 6	Mid Term Exam 1
Week 7	Chapter No. 3 Using High-Level Conceptual Data Models for Database Design, A Sample Database Application. Entity Types, Entity Sets, Attributes, and Keys Relationship Types, Relationship Sets, Roles, and Structural Constraints Weak Entity Types, Refining the ER Design for the COMPANY Database ER Diagrams, Naming Conventions, and Design Issues, Relationship Types of Degree Higher than Two Relational Database Design Using ER-to-Relational Mapping (Chapter No. 9)
Week 8	Chapter No. 8 Unary Relational Operations: SELECT and PROJECT Relational Algebra Operations from Set Theory Binary Relational Operations: JOIN and DIVISION Examples of Queries in Relational Algebra The Tuple Relational Calculus /The Domain Relational Calculus
Week 9	Chapter No. 18 Translating SQL Queries into Relational Algebra and Other Operators Algorithms for External Sorting Algorithms for SELECT Operation
Week 10	Chapter No. 14 Informal Design Guidelines for Relation Schemas Functional Dependencies/Normal Forms Based on Primary Keys General Definitions of Second and Third Normal Forms
Week 11	Mid Term Exam 2

Tentative Course Outline

Week 12	Chapter No. 14 Boyce-Codd Normal Form Multivalued Dependency and Fourth Normal Form Join Dependencies and Fifth Normal Form
Week 13	Chapter No. 20 Introduction to Transaction Processing Transaction and System Concepts Desirable Properties of Transactions Characterizing Schedules Based on Recoverability Characterizing Schedules Based on Serializability Transaction Support in SQL
Week 14	Chapter No. 21 Two-Phase Locking Techniques for Concurrency Control Concurrency Control Based on Timestamp Ordering Multiversion Concurrency Control Techniques Validation (Optimistic) Concurrency Control Techniques Granularity of Data Items and Multiple Granularity Locking
Week 15	Chapter No. 22 Recovery Concepts NO-UNDO/REDO Recovery Based on Deferred Update Recovery Techniques Based on Immediate Update
Week 16	Chapter No. 24 Introduction to NOSQL Systems Document-Based NOSQL Systems and MongoDB NOSQL Key-Value Stores Column-Based or Wide Column NOSQL Systems

Grading Policy

Assignments	5
Quizzes	5
Course Project	10
Mid Exams	30
Final Exam	50

Course Project

- Desktop application
- Mobile application
- Web application
- Use any platform
- Apply the learned concepts
- Team Work (3 Members)
- Start Exploration

How to get good score??

- Be punctual
- Attend the class regularly
- Be attentive during the lecture
- Ask questions
- Actively participate
- Give suggestions
- Must read the text book
- Do not CHEAT yourself!

Questions??