CS315: Database Systems
Introduction

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Mon 12:00-13:15, Tue 9:00-10:15

Rules

- Email `arnabb@cse.iitk.ac.in` to meet or for discussions
- Put "CS315" in the subject for automatic mail filters
- Participate
  - Attend classes
  - Clear doubts
  - Answer questions
- Do homeworks *individually*
- *No* extension of deadlines unless notified well in advance for a valid and convincing reason
- If you are sick, follow IITK procedure
  - Produce a sick certificate, etc.

Grading Policy

- Exams: 50-60%
  - End-semester: 30-35%
  - Mid-semester: 20-25%
- Assignments + Quiz: 20-30%
- Project: 20-25%
  - Groups of 5

Course Material

- Slides
- Classwork
- Books
  1. "Database System Concepts" by Silberschatz, Korth & Sudarshan. *McGraw-Hill*.
  2. "Fundamentals of Database Systems" by Elmasri & Navathe. *Pearson Education*.
  3. "Database Management Systems" by Ramakrishnan & Gerhke. *McGraw-Hill*.
  4. "Database Systems: The Complete Book" by Garcia-Molina, Ullman & Widom. *Prentice Hall*.
  5. "Principles of Database Management" by Lemahieu, Broucke & Baesens. *Cambridge University Press*.

Course Contents

1. Motivation
2. Relational model
3. Relational algebra
4. SQL
5. Normalization theory
6. Physical design
7. Indexing
8. Query processing
9. Query optimization
10. Transactions
11. Recovery systems
12. Schedules
13. Concurrency control
14. NoSQL systems

Concept of a Database

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- A database is a collection of *interrelated* data
- A database management system (DBMS) provides an environment that is *efficient* and *convenient* to use
- Programs and interface to
  - Store data
  - Visualize data
  - Access (query) data
  - Manipulate data

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- Security
  - Provides access to only some part of the data