

Database Management Systems (CPTR 312)

Preliminaries

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- Email me with subject starting with **CPTR312**
- <http://users.manchester.edu/Facstaff/RAhmad/classes/312/index.htm>
 - Also, Angel's course webpage has a link to above

Preliminaries

- Course
 - Science 142, MWThF: 9 – 9:50 am
- Databases:
 - Crucial
 - Insightful
 - Challenging
- Discuss problems early, often
- Assignments, quizzes, tests
- Slides will be available online
- Keep up to date with the deadlines and due dates

Introduction to Databases

Chapter 1: Introduction

- Purpose of Database Systems
- View of Data
- Database Languages
- Relational Databases
- Database Design
- Object-based and semistructured databases
- Data Storage and Querying
- Transaction Management
- Database Architecture
- Database Users and Administrators
- Overall Structure
- History of Database Systems

Database Management System (DBMS)

- DBMS contains information for a community of users
 - Collection of interrelated data
 - Set of programs to access the data
 - An environment that is both convenient and efficient to use
- Database Applications:
 - Banking: all transactions
 - Airlines: reservations, schedules
 - Universities: registration, grades
 - Online retailers: order tracking, customized recommendations
 - Manufacturing: production, inventory, orders, supply chain
 - Human resources: employee records, salaries, tax deductions
- Databases touch all aspects of our lives; *most pervasive software*

History

- In the early days, database applications were built directly on top of file systems
- Drawbacks of using file systems to store data:
 - Data redundancy and inconsistency
 - Multiple file formats, duplication of information in different files
 - Difficulty in accessing data
 - Need to write a new program to carry out each new task
 - Data isolation — multiple files and formats
 - Integrity problems
 - Integrity constraints (e.g. $\text{account balance} > 0$) become “buried” in program code rather than being stated explicitly
 - Hard to add new constraints or change existing ones