



PennState

CMPSC431W: Database Management Systems

Lecture 1

08/24/15

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Course Website: <http://www.cse.psu.edu/~yul189/cmpsc431w>

Slides based on McGraw-Hill & Dr. Wang-Chien Lee



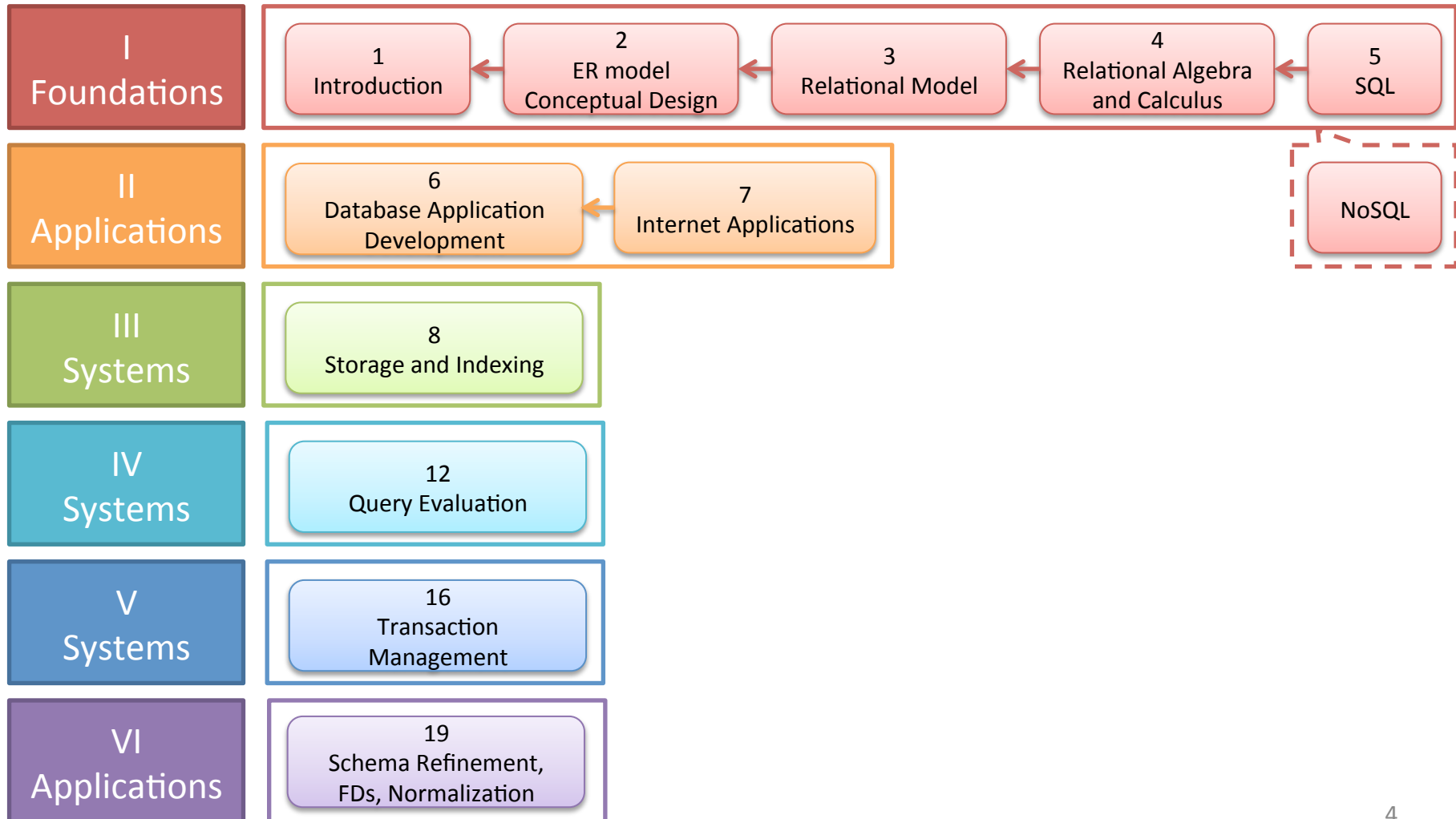
Outline

- Overview of this course
- Motivation for studying database management systems
- Three types of data models

Course Emphasis

- How to *design* a database application
- How to *use* a DBMS effectively
- How a DBMS *works*

Course Organization



CHAPTER 1: OVERVIEW OF DATABASE SYSTEMS

What is a DBMS?

- Database
 - is storage of _____;
 - Maintains a very _____, _____ collection of data.
- A database models a real-world enterprise.
 - _____ (e.g., students, courses)
 - _____ (e.g., John is taking CMPSC 431W)
- Database Management System (DBMS) is a software package designed to store and manage databases.

Database Applications

- **Banking:** all transactions
- **Airlines:** reservations, schedules
- **Universities:** registration, grades
- **Sales:** customers, products, purchases
- **Manufacturing:** production, inventory, orders, supply chain
- **Human resources:** employee records, salaries, tax deductions

... The list goes on!

File System v.s. DBMS

- **File system:** a collection of individual _____ accessed by application programs
- **DBMS:** a computerized record-keeping system
- Drawbacks of file systems:

- _____
- _____
- _____
- _____

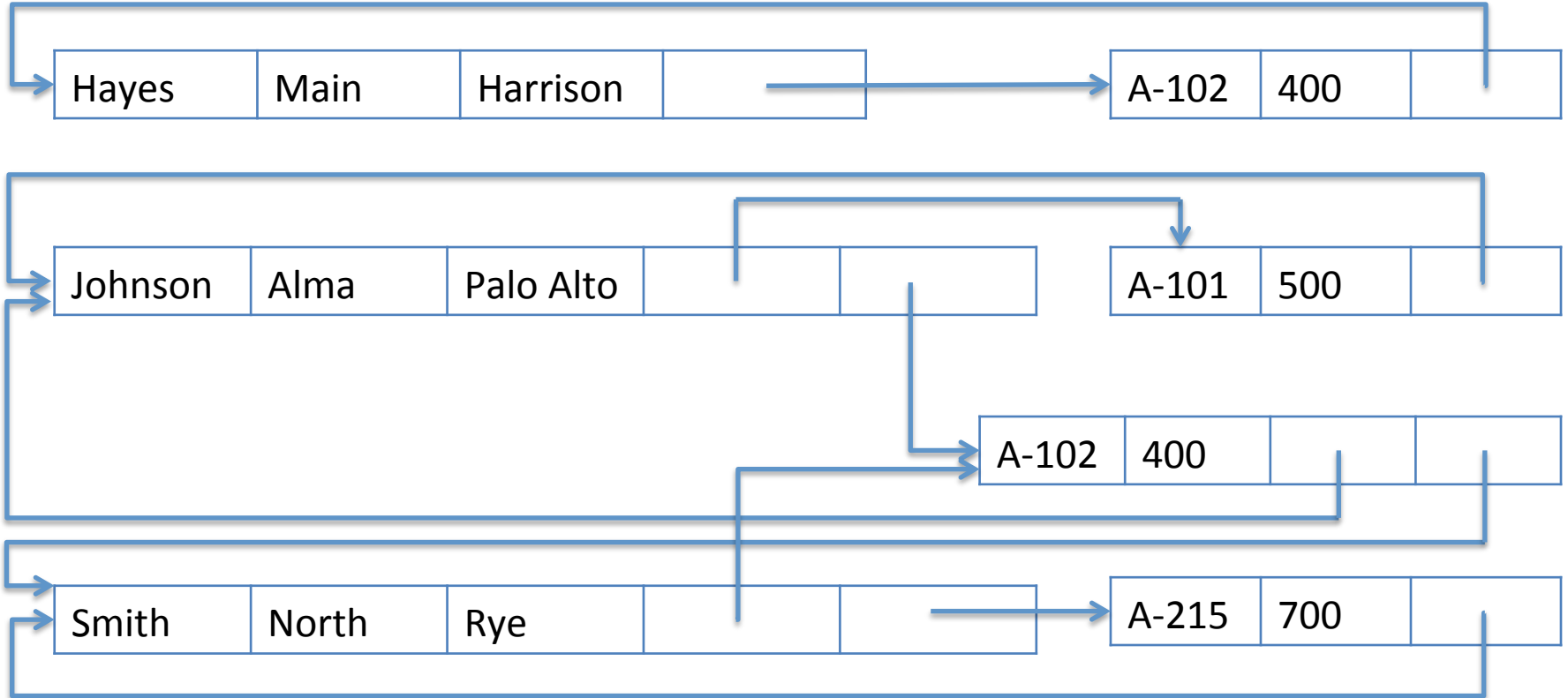
Why Use a DBMS?

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Data Models

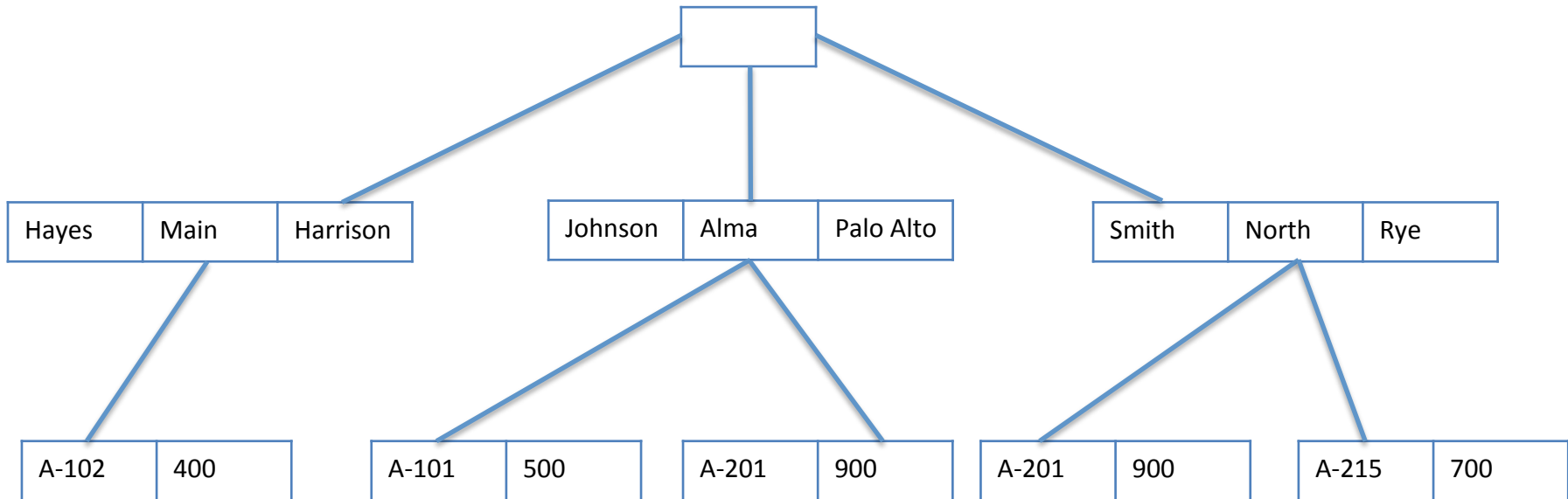
- A data model is a collection of high-level constructs for describing stored data that hides low-level storage details.
- Three major data models are
 - _____ data model
 - _____ data model
 - _____ data model

Network Data Model



Data records are linked as _____.

Hierarchical Data Model



The hierarchical model organizes data records as collections of _____.

Relational Data Model

- The relational data model is the most widely used data model today.
 - Main concept: _____, basically a table with rows and columns.
 - Every relation has a _____, which describes the columns, or fields.
- Example:
Students (*sid*: string, *name*: string, *login*: string, *age*: integer, *gpa*: real)

Don't Forget

- Sign up the two accounts:
 - GitHub
 - Asana
- Submit your team information, along with account information, by this Friday (8/28)
- Reading:
 - Project description: prepare any question to discuss on Friday
 - Section 1.1 ~ 1.5