

CS122 Using Relational Databases and SQL

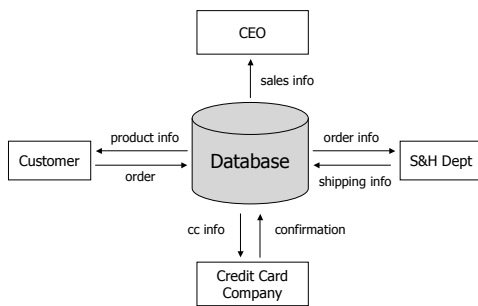
Introduction to Relational Databases and SQL

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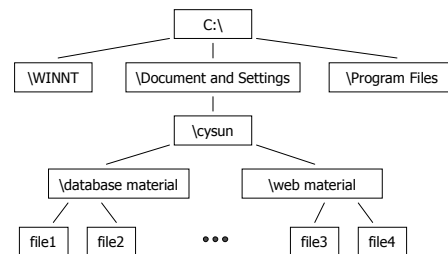
Ubiquity of Databases

- ◆ Anywhere where a large amount of information needs to be managed safely and efficiently
 - Utility companies, grocery stores
 - Schools
 - Doctor's offices, hospitals
 - Government agencies
 - Web sites
 - ...

An Example of a Database Application

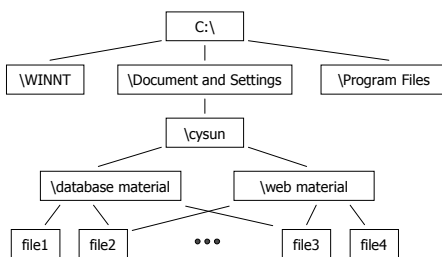


Hierarchical Model



What about material related to both web and database??

Network Model



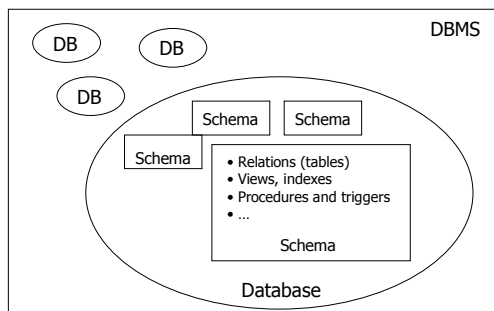
Relational Model

- ◆ Proposed by Edgar F. Codd in early 1970's
- ◆ Data is stored in tables
- ◆ All major database systems these day are relational

student_id	first_name	last_name	birthday
2000001	John	Doe	1970-1-1
2000002	Jane	Doe	1971-1-1
2000003	Tom	Smith	1962-2-2

So how do we store the directory structure in a table??

The Big Picture



DBMS

- ◆ Database Management System (DBMS) is a software that manages databases
- ◆ Common DBMS
 - Commercial – Oracle, IBM DB2, MS SQL Server, Access
 - Open source – MySQL, PostgreSQL

Database and Schema

- ◆ A database is a collection of data managed by a DBMS
- ◆ A database contains one or more *schemas*
- ◆ A schema contains a number of *schema elements*, such as tables, indexes, stored procedures, and so on.

More Terminology

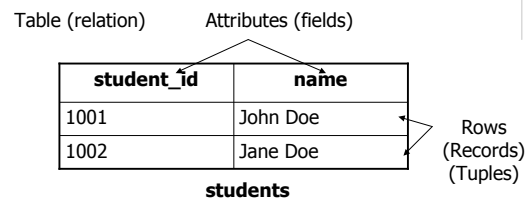


Table (relation) schema:
students(student_id, name)

Database schema: database name + table schemas

Attribute Type

- ◆ Determines the storage required for a field
- ◆ Common attribute types
 - String types
 - Numeric types
 - Date and time types
 - Other types

SQL

- ◆ Structured Query Language
- ◆ A standard query language for relational databases
- ◆ Supported by all major DBMS (with some variations)

Some SQL Examples

- ◆ Create a table
- ◆ Populate the table
- ◆ Find some information
- ◆ Delete the table

Database Development

