

Types of Database

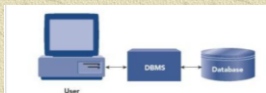
- Traditional
- Deductive Databases
- Multimedia Databases
- Distributed Databases
- Spatial Databases
- Object-Oriented Databases

Sizes of Database

- Personal (1 User), Megabytes
- Workgroup (<25 Users), Megabytes
- Department (25-100 Users), Gigabytes
- Enterprise (100-1000s), Gigabytes
- Internet (100-1000s), Terabytes

Database Management System (DBMS)

- Software to
1. Define a database
(data types, structures, constraints)
 2. Construct a database
(populate database with data)
 3. Manipulate database
(query and update data in database)



Database People

- ✦ Database designers
- ✦ Application developers
- ✦ Database administrators
- ✦ Users



Database Environment

- Users
 - Administrators
 - System Developers
 - End Users
- Interface
 - Applications
 - User Interface
 - CASE tools
- Database System
 - Repository
 - DBMS
 - Database

Sample Database

Henry Books (available from web-page)

User Data

- Records, Fields (Columns)
- Data elements

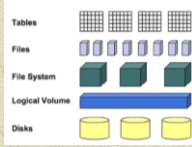
Meta Data

- Data Types
- Relationships
- Indexes
- Application Metadata (Forms, Reports, etc.)

File Processing

File system is backbone of operating system

File system for data storage:



Adapted from: http://blogs.netapp.com/databases-WindowsLiveWriter/image_29.png

Disadvantages of File Processing

- Program-Data Dependence
- Redundancy (Duplication of Data)
- Limitation on data sharing
- Development time
- Maintenance

Advantages of Databases

- Program-Data Independence
- Control of Data Redundancy
- Data Consistency
- Data Quality (constraints)
- Data Sharing (customized access through views)
- Improved Data Access
- Program Maintenance

Three Schema Architecture

Describe structure of data (relationships, behavior) at different levels of abstraction.

External

high-level user view

Conceptual

view of data administrator

Internal

Logical: structure of data for DBMS

Physical: storage details (indexes) for DBMS

Data Models

Conceptual/External

ER-model (Entity-Relationship)

Logical

Relational data model

Object data model

Network data model

Hierarchical data model

Physical

Frame-memory model

ER-modeling

Describes **entities**, their **relationships**, and **attributes**

Used for designing and analyzing a database

