

Fundamentals of Database Systems

Introduction to Databases

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Concept of a database

- 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

Advantages over file systems

- Reduces data redundancy and data inconsistency
 - Stores data once
 - Can be combined at runtime
- Data isolation
 - Data is stored in an internal format
 - One interface to access data
- Data integrity
 - Example: CPI is positive and not more than 10
 - Logic is encoded in databases, not buried in program code
- Atomicity of operations
 - Transactions
 - Example: money transfer from one account to the other
- Concurrency for multiple users
 - Automatically handles access problems and inconsistency issues
- Security
 - Provides access to only some part of the data