

Introduction to databases

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Bases de Dados

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Based on Christopher Ré and Jennifer Widom slides

Agenda

What is a Database Management System?

Scope of this course

Key concepts

Key people

Database Management Systems (DBMS)

Provides efficient, reliable, convenient, and safe multi-user storage of and access to massive amounts of persistent data.

Massive

Terabytes of data

Multi-user

Concurrency control

Persistent

Data in databases outlive the programs that execute on that data

Convenient

Physical data independence
High-level query languages

Safe

Possible failures: hardware, software, power, users
Ensure the consistency of the data

Efficient

Thousands of queries/updates per second

Reliable

99,99999% up time

Scope of this course

Database applications may be programmed via “frameworks”

DBMS may run in conjunction with “middleware”

Data-intensive applications may not use DBMS at all

We'll focus on the DBMS itself.

Key concepts

Data model

Description of how the data is structured

Examples: set of records, XML, graph

Schema versus data

Analogy: types and variables in programming languages

Data definition language (DDL)

Set up schema

Data manipulation or query language (DML)

Querying and modifying

Key people

DBMS implementer

Builds system

Database designer

Establishes schema

Database application developer

Programs that operate on database

Database administrator

Loads data, keeps running smoothly

Whether you know it or not, you're using a database every day.

History of Databases

<https://www.youtube.com/watch?v=KG-mqHoXOXY>