Data And Applications

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Contents

Chapter 1

Lecture 1

1.1 Course Details

Textbook: Elmasri

Contents of Course:

1. Introduction/Database Concepts
2. Data Modeling
3. Relational Model
4. Normalization
5. Algebra/Calculas/SQL

1.1.1 Project

Database Design Project.

– Four phases - Rotation – group of 3 members
1 – Requirements Analusis 2 – Conceptual Design 3 – Logical Design 4 – Applications & SQL

1.1.2 Motivation for the course

- As a CS person, you are going to work with data and databases.
- Second Largest Software Sales is Database Systems Want a job? Do this course
- A lot more was said but i wasnt paying attention :(Overall a useful course.

1.2 What are Database Systems?

Any piece of information that can be captured is data.

There is birth of data and rarely a death of data. For example, you send a ping to another computer and ask "Are you alive?", the time and message is recorded. The time and message is data. The time is the birth of data.

Data ← Factual (undoubted) information that can be recorded and have implicit meaning.

A database is a collection of related data.

For example, what courses students of a batch are taking. This is related data. A database can be formed from this data and probably already exists in IIIT database.

1.2.1 What is a Database?

A database has the following implicit properties:

- A database represents some aspect of the real world. (Universe of Discourse)
- A database is a logically coherent (associated, related) collection of data with some inherent meaning.
- A database is designed, build, and populated with data for a specific purpose.
- It has an intended group of users and some preconceived (already thought of) applications in which these users are interested.

1.2.2 Database System

A database system (DBMS) is a collection of programs that enables users to create and maintain a database.

- Defining Databases – involves specifying the data types, structures, and contraints for the data to be stored in the database.
- Constructing Databases – sotring the data itself (populating) on some storage medium that is controlled by the DBMS.
- Manipulating Databases – quering the database to retrieve specific data, updating the databases to reflect changes to mini-world.

Simplified Database System

(Figure)

1.2.3 Example of a Database

Consider a part of a University environment

We need data about: STUDENTSs
COURSEs
SECTIONs (of COURSEs)
(academic) DEPARTMENTs
INSTRUCTORSs

The above data is related as follows: SECTIONs are of specific COURSEs
STUDENTs take SECTIONs
COURSEs have prequistic COURSEs