Database Management System

Text Book:

Elmasri and Navathe: Fundamentals of Database Systems, Addison-Wesley, 3rd edition and onwards.

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Transfer the data as per your wish from container A to container B

A

●	★	1	★	●
✚	D	B	✚	★
9	4	●	★	M
A	8	S	✚	●
★	✚	1	●	✚

B

Note: Any proper pattern would do…

A

●	★	1	★	●
✚	D	B	✚	★
2	3	●	★	M
A	4	S	✚	●
★	✚	5	●	✚

B

●	●	●	●	●
✚	✚	✚	✚	✚
★	★	★	★	★
A	B	D	M	S
1	2	3	4	5

This is Database

A

●	★	1	★	●
✚	D	B	✚	★
2	3	●	★	M
A	4	S	✚	●
★	✚	5	●	✚

B

●	●	●	●	●
✚	✚	✚	✚	✚
★	★	★	★	★
A	B	D	M	S
1	2	3	4	5

If you tell Alexa or Siri to do it for you??

Then…….

A

●	★	1	★	●
✚	D	B	✚	★
2	3	●	★	M
A	4	S	✚	●
★	✚	5	●	✚

B

●	●	●	●	●
✚	✚	✚	✚	✚
★	★	★	★	★
A	B	D	M	S
1	2	3	4	5

This is Management System

- Database: A **Database** is a collection of related data organized in a way that data can be easily accessed, managed and updated.
- Management system: A **DBMS** is a software that allows creation, definition and manipulation of database. Dbms is actualy a tool used to perform any kind of operation on data in database.

Software can be anything…

- Junk cleaner
- C cleaner
- Clean sweep
- Trash Cleaner
- Etc……

In this subject..

- We will study how to keep the data..
- We will study how to manage the data..
- We will study how to organize the data..
- We will study how to place data in software
- We will study how to extract data from software

- And few more things…….

Course learning objectives

1. To discuss and realize the importance of Database Architecture Design notations, ER Modeling, Mapping and Schema design.
2. To gain the knowledge Relational algebra and learn the use of SQL and PL/SQL.
3. To introduce formal database design approach through normalization and discuss various normal forms.
4. To understand the importance of Concurrent Transactions and discuss issues and transaction control algorithms.

Unit – I

- **Introduction:**
  - Introduction to database,
  - Characteristics of Database approach,
  - Advantages of using DBMS approach,
  - Three-schema architecture and data independence.
- **Entity-Relationship Model:**
  - Using High-Level Conceptual Data Models for Database Design;
  - An Example Database Application;
  - Entity Types, Entity Sets, Attributes and Keys;
  - Relationships, Relationship types, Roles and Structural Constraints; Weak Entity Types.

Unit – II

- **Relational Model and Relational Algebra:**
  - Relational Model Concepts;
  - Relational Model Constraints and Relational Database Schemas;
  - Update Operations,
  - Dealing with constraint violations;
  - Unary Relational Operations: SELECT and PROJECT;
  - Relational Algebra Operations from Set Theory;
  - Binary Relational Operations: JOIN and DIVISION;
  - Additional Relational Operations.

Unit – III

- **Database Design:**
  - Informal Design Guidelines for Relation Schemas;
  - Functional Dependencies; Normal Forms Based on Primary Keys;
  - General Definitions of Second and Third Normal Forms;
  - Boyce-Codd Normal Form.
- **Transaction Processing Concepts:**
  - Introduction to Transaction processing,
  - Transaction and System concepts,
  - Desirable properties of Transactions and issues with concurrent transactions.

Unit – IV

- **SQL :**
  - SQL Data Definition and Data Types;
  - Specifying basic constraints in SQL;
  - Schema change statements in SQL;
  - Basic queries in SQL;
  - More complex SQL Queries.
  - Insert, Delete and Update statements in SQL.

Unit – V

- PL/SQL :
  - PL/SQL Block Structure,
  - PL/SQL Variables, PL/SQL Function ,
  - PL/SQL Procedure,
  - PL/SQL IF Statement ,
  - PL/SQL Loop Statement:
    - PL/SQL WHILE Loop Statement,
    - PL/SQL FOR Loop Statement.

Course Outcome (Cos)

1. **Apply** the database concepts and design database for given application scenerio.
2. **Apply** the concepts of Normalization and design database which eliminates all anomalies.
3. **Create** database and develop database programming skills in SQL and PL/SQL.
4. **Explain** the issue of concurrency control in transaction processing.