Tuesday
8/10/24

Database System

conceptual layer is also called logical layer.
external layer is also called physical layer

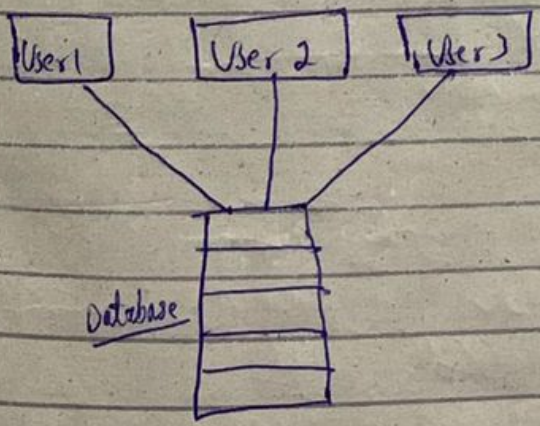
=> Data Independency: A procedure in which data is separated from user.

(i) Logical Data Independency: On logical level, the changes (conceptual layer) shouldn't be shown to user in the interface. (Example)
(ii) Physical Data Independency: Changes in physical layer/ internal layer won't be shown to user. (Example)

=> Database Architecture: (design of something) Three types of DB architectures

1-Tier: (obsolete) when your data, user & database is in one (system) device only.
2 Tier: 2 Tier: User is directly linked with database.
3 Tier

2 Tier

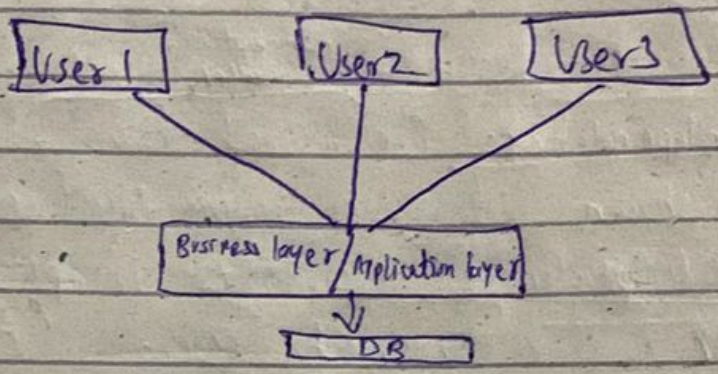


Pros: 1) Maintainence is easy.

Cons: 1) Limited access database.
2) Security issues as user directly accesses and can change.

4) slower

3 Tier:



Prosr

1) 24/7 access
2) Unlimited users can access
3) Security is better in tier 3 than in tier 2.
~~4) Takes less time~~
4) Faster

Consr

1) Maintainence is difficult.

TUESDAY
22/10/24

DATABASE SYSTEM

DDLC (Database Development Life Cycle)

(i) Database Planning
(ii) System Definition
(iii) Requirement collection & analysis
(iv) Database design
  - → Conceptual phase
  - → Logical phase
  - → Physical phase

(v) DBMS Selection (Optional)
(vi) Application Design
  - → Transaction
    - → Characteristics

(vii) Prototyping (optional)
(viii) Implementation (DDL)
(ix) Data Conversion & Loading
(x) Testing
(xi) operational maintainance
  - → Feedback
    (after feedback, cycle is started again)

Tuesday

15/10/24

DATABASE SYSTEM

Relational Database

→ Relations / Table / File (same meaning)

→ Row / Tuple / Record (same meaning)

→ Attributes / Columns / Field (same meaning)

Properties of Relation

→ There should be a distinct/unique name of table.
→ There should only be a single value in a cell.
→ Every attribute should have a unique/distinct name.
→ All values in an attribute should be of same domain

Use of Relational Database in Different Sectors

-> Banking
-> Airlines (biggest user of RDBMS)
-> Universities
-> Hotels
-> Credit Card (Debit Card Transactions)
-> Tele-communication
-> Finance
-> Sales
-> Human Resource (HR)
-> Web Based Services

→ Every tuple should be unique/distinct.
→ No significance is required in the order of tuple.
→ " " " " " " " " attribute.

~~[illegible]~~

Based Relations

Diff. b/w DBMS & RDBMS

DBMS	RDBMS
1) Data is stored in the form of rows & columns.	Data is stored in the form of relations.
2) Data is temporarily stored.	Data is permanently stored.
3) No concept of key	Key is used
4) No restriction on duplication of rows & columns.	Duplication is not allowed.
5) For single-user.	For multi-user.
6) Codd's rules are not ~~[illegible]~~ satisfied.	Codd's rules are satisfied.

Home
Task: Where is "DBMS" practically implemented?

Interactive Graph & Relational (used before relational database).

Structural Part of Relational Database:

Relations are in the form of rows & columns.

Table is known as relation of rows & columns.

→ Applied to logical level

→ Shows relation b/w entities and tables

Every relation is a table but every table is not a relation.

If there is only one table, then it is a flat database.

Attributes:
Unique name of column is called attribute.
like Name, S.No., Age, etc.

Degree:
No. of attributes in a table.

Tuple/Record in table relation
A row is called tuple.

Field:
A column in table is called field.

Cardinality:
Total no. of tuples in a relation.

Domain:
Set of allowable value for one or more than one columns.

Monday
14/10/24

Database System

abstract representation of a project

Database Model:-

Abstract representation of data. Purpose is to ~~understand the way~~ represent data in an understandable way.

Three parts of data model:
→ Structural part
→ Manipulative part: Defining operations that will be performed.
→ Set of integrity rules: Some rules that data to be valid will be implemented to accept certain type of data

Categories of Database Models:-

1) Object Based / Conceptual Model
2) Record Based / Relational Database Model
3) Physical

→ **Record Based Data Model**

Deals with conceptual layer & sometimes with external layer.

Types:
- Relational Data Model: In the form of table, hierarchy like 1970s. Using mathematical rules
- Network " "
- Hierarchical " "

→ A relational model of data for large shared database (name of paper where relational data model was explained). It had 12 rules that if followed, it is a relational database.