DataBase Design

Database Design

- Database design or database model
- Database design represent the **logical structure** of database
- The process of creating a logical representation of the structure of database is called database design.
- It should be representing graphically
- The goal is to identifying the fact to be store in database

Database Design

- Data modeling involves users and analyst
- Database design is created using a **data model**.
- Data models define how data is connected to each other and how they are processed and stored inside the system.
- Data models define how the logical structure of a database is modeled.
- Data Models are fundamental entities to introduce **abstraction in a DBMS.**

Data Model

- Data model is a set of tools that are used to develop a database design.
- Data model is used to develop a database design
- Graphical system used to capture the nature and relationship among data

Data Model

- Data models are created at **enterprise level** as well as **project levels**
- Data model organizes data for various users
- Every DBMS is based on Data Model

Data Model

Component of Data Model

- Structure Part
- Manipulation Part
- Integrity Constraints Supports

Data Model

Type of Data Model

- Semantic Data Model
- Records Based Data Model
- Physical Data Model

Data Model

Semantic Data Model

- The model which provide more tool
- They only deal at External Level and Conceptual Level

- Type of Semantic Data Model
  - Object Based Data Model
  - Entity Relationship Data Model

Data Model

Records Based Data Model

- The database consists of a number of fixed-format records and each record type having fixed number of fields.
- Type of Records Based data model are
  - Relational Data Model
  - Network Data Model
  - Hierarchical Data Model.

Data Model

Records Based Data Model

- **Relational Data Model**
  - Based on mathematical relation
  - **Tables** are used to represent Data and Relationships

Data Model

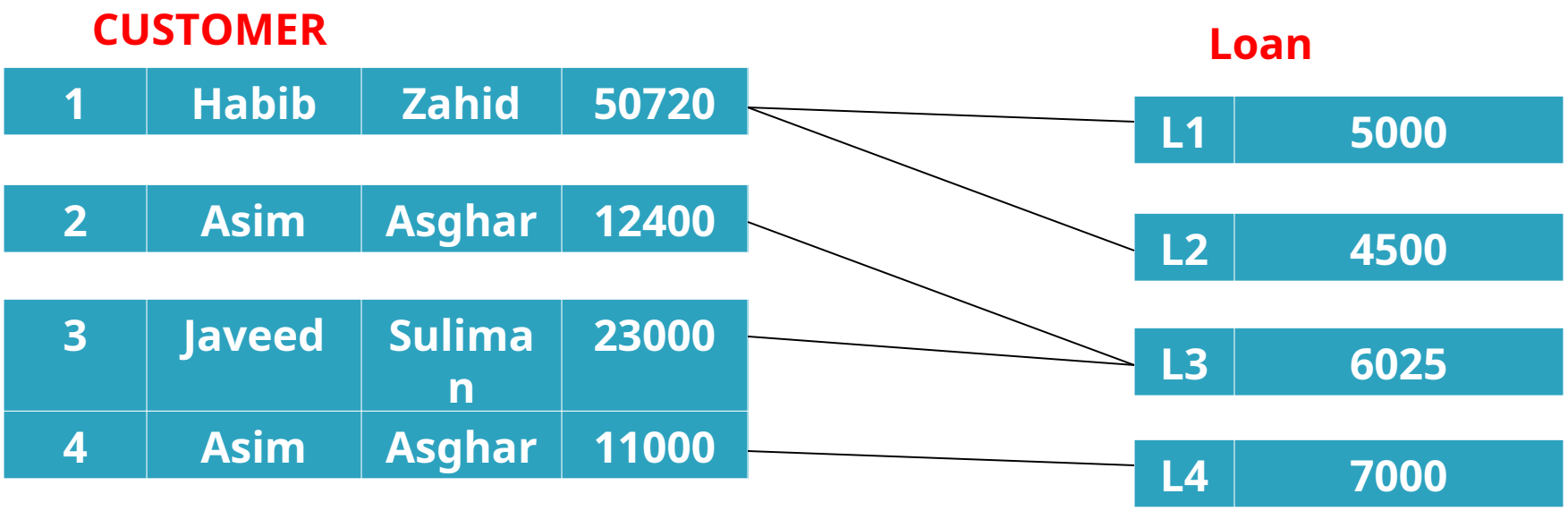
Records Based Data Model

- **Network Data Model**
  - Sometimes called the DBTG model.
  - Data is stored in records; each record consists of a group of related data values**.**
  - Each record can have several child and each child record can have more then one parent records.
  - The IDS database architecture based on network data model.

Data Model

Records Based Data Model

- **Network Data Model**



Data Model

Records Based Data Model

- **Network Data Model**
  - Parent Record is called Owner
  - Child Record is called Member
  - Support 1-1, 1-M & M-M relationship
  - Support **recursive relationship**

Data Model

Records Based Data Model

- **Network Data Model**
  - **Disadvantages**
  - Structure should must be defined in advanced which is difficult task.
  - It is very complex to understand and developed

Data Model

Records Based Data Model

- **Hierarchical Data Model**
  - Use two data structuring concepts: **records** and **parent-child relationships**
  - A record is a collection of field values that provide information on an entity or a relationship instance.

Data Model

Records Based Data Model

- **Hierarchical Data Model**
  - Use two data structuring concepts: **records** and **parent-child relationships**
  - A record is a collection of field values that provide information on an entity or a relationship instance.
  - A parent-child relationship type (PCR type) is a 1:M relationship between two record types.

Data Model

Records Based Data Model

- **Hierarchical Data Model**
  - Hierarchical data model is **tree like structure** database and data is store in the form of branches.
  - The IMS database architecture based on Hierarchical data model.
  - Another popular hierarchical DBMS is MRI's System-2000

Data Model

Records Based Data Model

- **Hierarchical Data Model**
  - In hierarchical data model, high level record is called parent
  - The parent at top most position is called root.
  - A lower level record is called child
  - A parent may have more then one child but a child can have only one parent.

Data Model

Records Based Data Model

- **Hierarchical Data Model**
  - This model can support 1:1 and 1:M relationship directly
  - It can not support M:M relationship and recursive relationship directly.
  - The IMS database architecture based on Hierarchical data model.
  - Another popular hierarchical DBMS is MRI's System-2000

Data Model

Records Based Data Model

- **Hierarchical Data Model**
  - **Advantages**
  - Flexible for changing the structure
  - Insertion, deletion and modification is easy
  - Little skill is required to developed and understand
  - Accessing and updating is very fast

Data Model

Records Based Data Model

- **Hierarchical Data Model**
  - **Disadvantages**
  - Structure should must be defined in advanced which is difficult task.
  - Adding new records to database need to redefined the whole database
  - No relationship between child records

Have a Nice Day