Database Management System

By,

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Outline of Lecture 2

- Data Abstraction
- Data Models

Data Abstraction

- System hides certain details of how the data is stored and maintained.
- Complexity should be hidden from database users.

Levels of Abstraction

- Physical
- Logical
- View

Physical level

- How the data are stored.
- Eg. Index, B tree, hashing.
- Low level abstraction.
- Complex low level structures is described in detail.

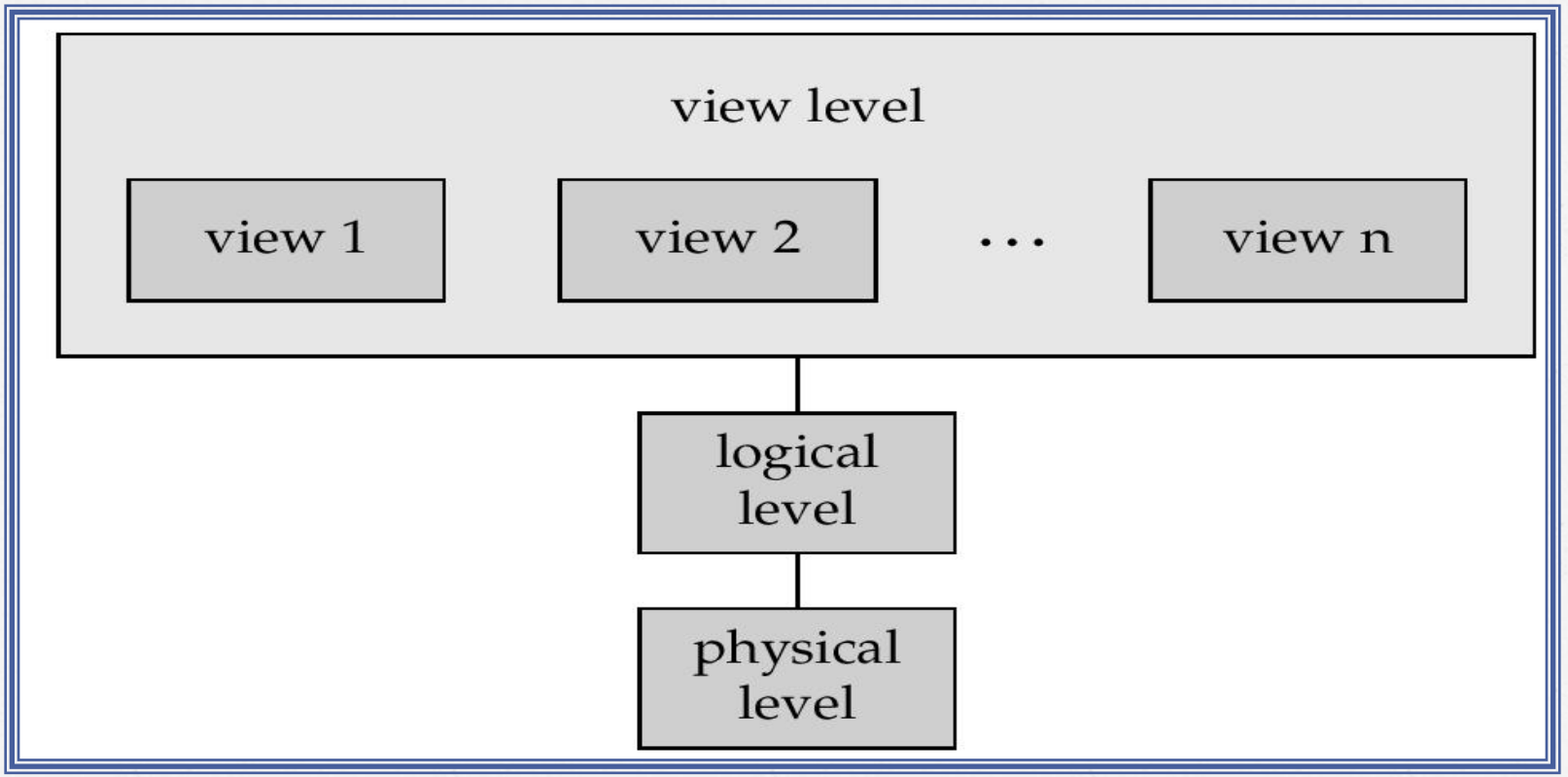
Logical level

- Describes what data are stored.
- Relationship among the data.
- Database administrator level.

View level

- Describes the part of the database to the particular user.
- Can be many different views of the database.
- Eg. Teller in a bank get a view of customer account not their balance.

Data Abstraction



Data Models

Collection of conceptual tools for describing data, data relationships, data semantics, and data constraints.

Types

- Object based logical model
- Record based logical model

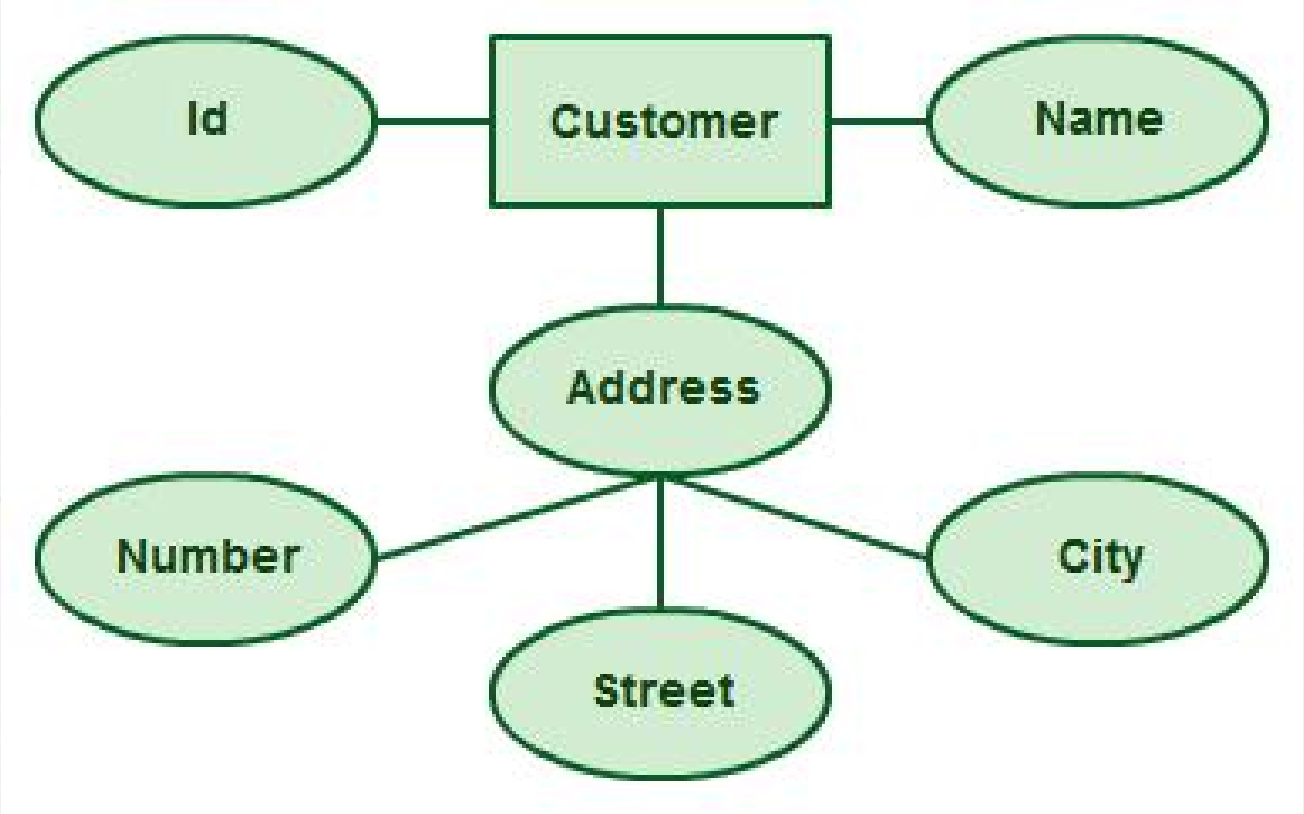
Object based logical model

- Describes data at logical and view level.
- ER model, Object oriented model.

ER model

- Based on real world objects and relationship among that objects.
- Components:
  1. Entity.
  2. Attribute.
  3. Relationship.

ER model



Object oriented model

- Based on collection of objects.
- Object contains value stored in an instance variables within the object.
- Object also contains methods(bodies of code).
- The object which contains same type of values and methods are grouped in classes.

Example

- Object: Bank Account.
- Instance variable: Number and balance.
- Method: pay_interest

Record based logical model

- Describe data at logical and view level.
- Database is structured in fixed format record.
- Each record type define a fixed number of attribute.

Types of Record based model

- Relational Model
- Network Model
- Hierarchical Model

Relational Model

- Data and relationship are represented by Tables.
- Each table has number of columns with unique names.

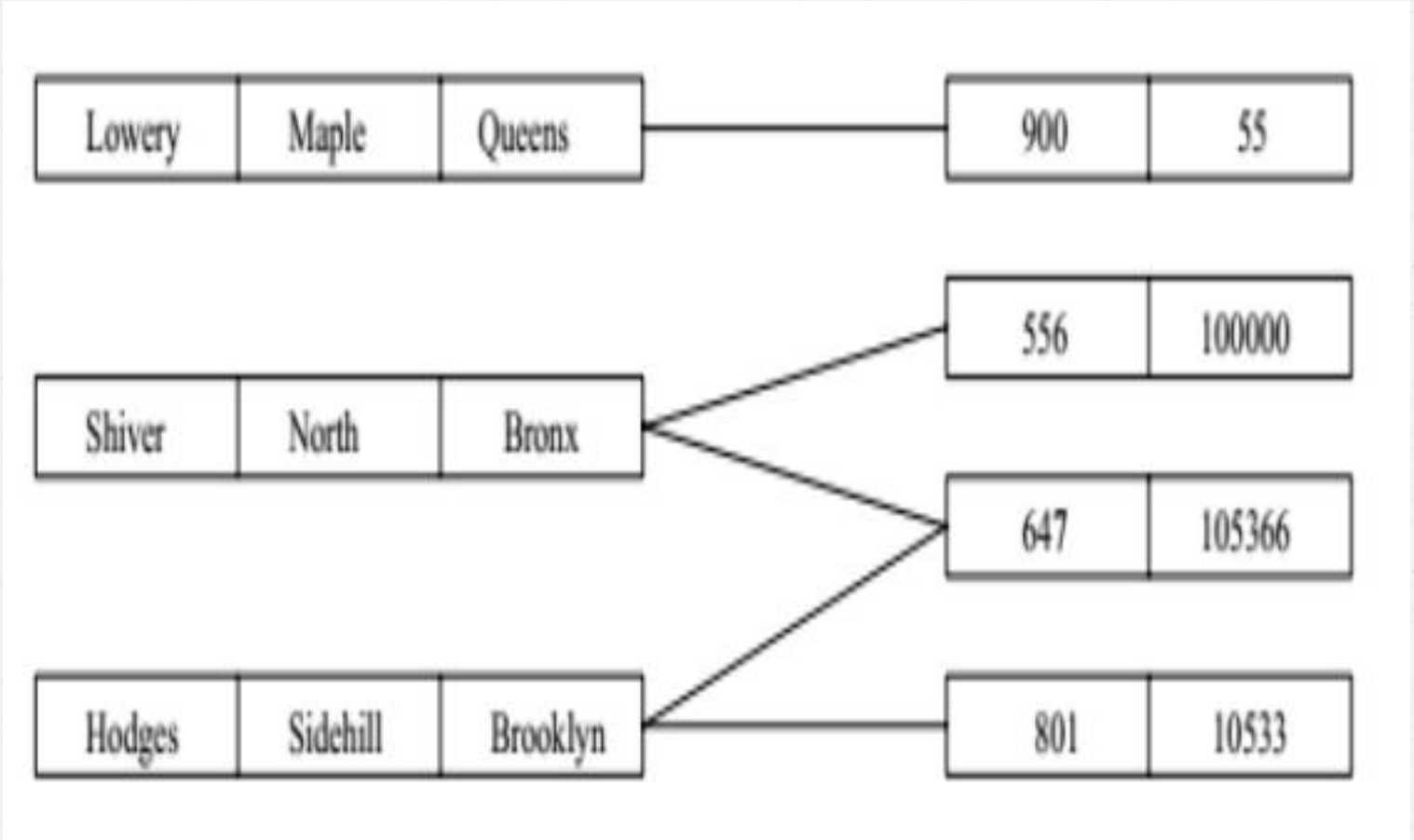
Example

Rollno	Name	Marks
1	Harsh	87
2	Pooja	88
3	Kunj	77

Network Model

- Data are represented by collection of records.
- Relationship among data are represented by links.
- Organization is that of the arbitrary graph.

Network Model

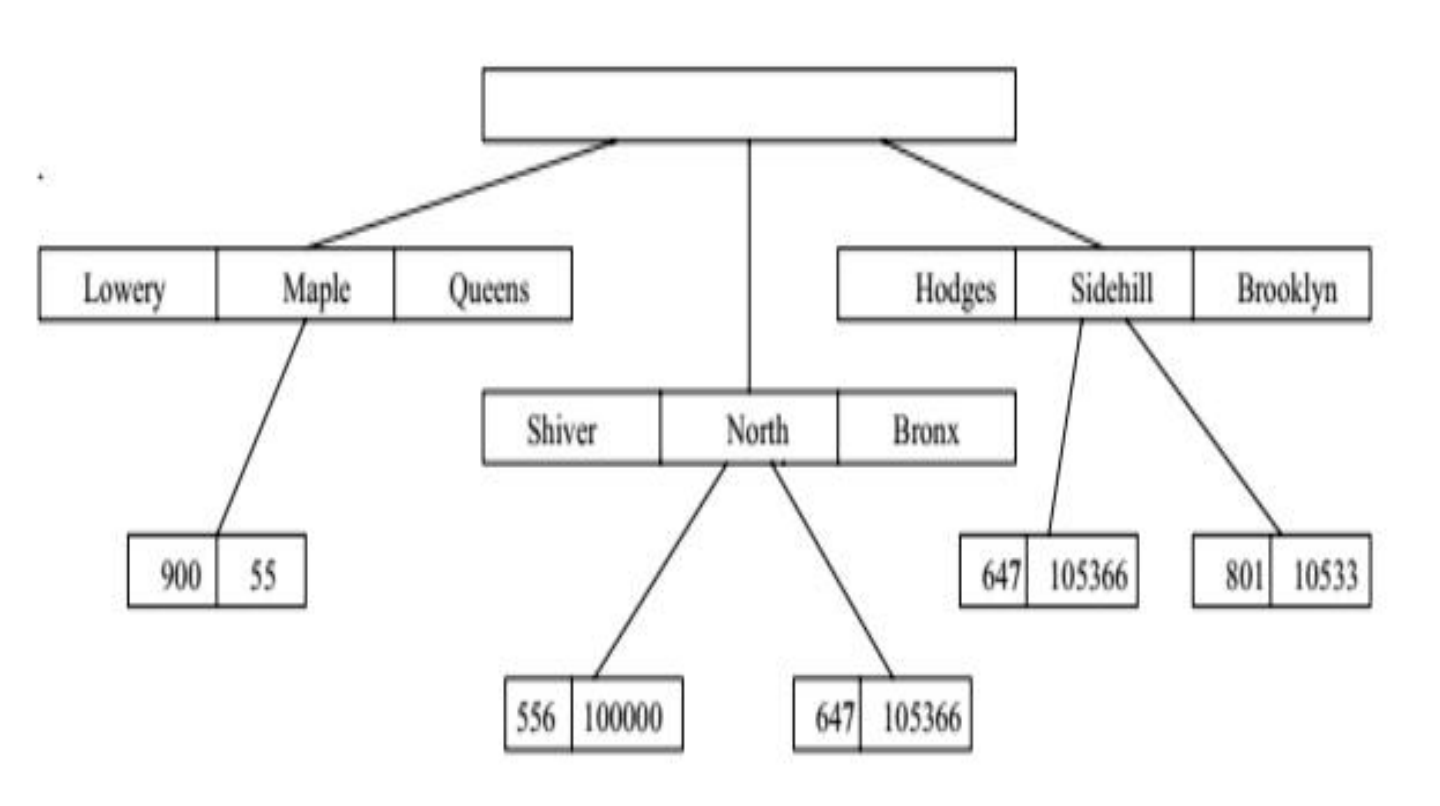


Hierarchical Model

- Similar to Network model.

- Organization of record is as collection of trees.

Hierarchical Model



Instances and Schema

- The information in the database at a particular point in time. (value of a variable)
- The overall design of the database. (data definition)

Any Questions ??

End of Lecture 2