Bharathidasan University

Centre for Differently Abled Persons

Tiruchirappalli - 620024.

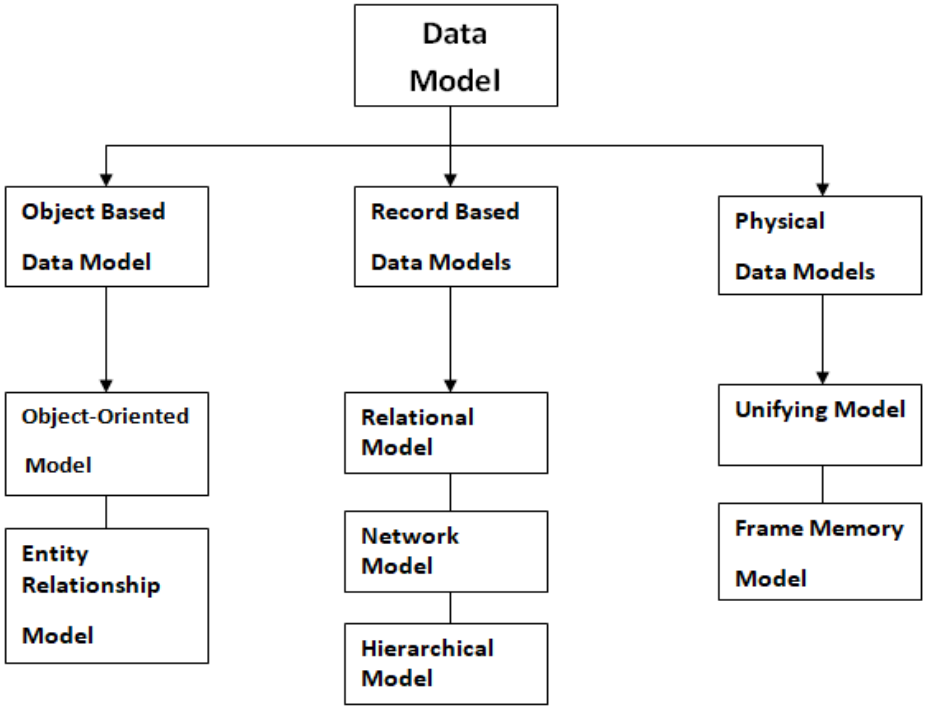
- Programme Name : Bachelor of Computer Applications
- Course Code : 23UCAEC04A
- Course Title : Database Management Systems
- Semester : IV
- Unit : Unit III
- Compiled by : Dr. M. Prabavathy
  Associate Professor
  Ms. G. Maya Prakash
  Guest Faculty


Online
Computing
DBMS
Business

DATA MODELS

Data Models

Data models define how data is connected to each other and how they are processed and stored inside the system.



1. Object Based Data Models

Object-based data model focus on how data is represented.

There are two types of object-based data Models

- Entity Relationship Model
- Object oriented data model.

(i) Entity Relationship Model

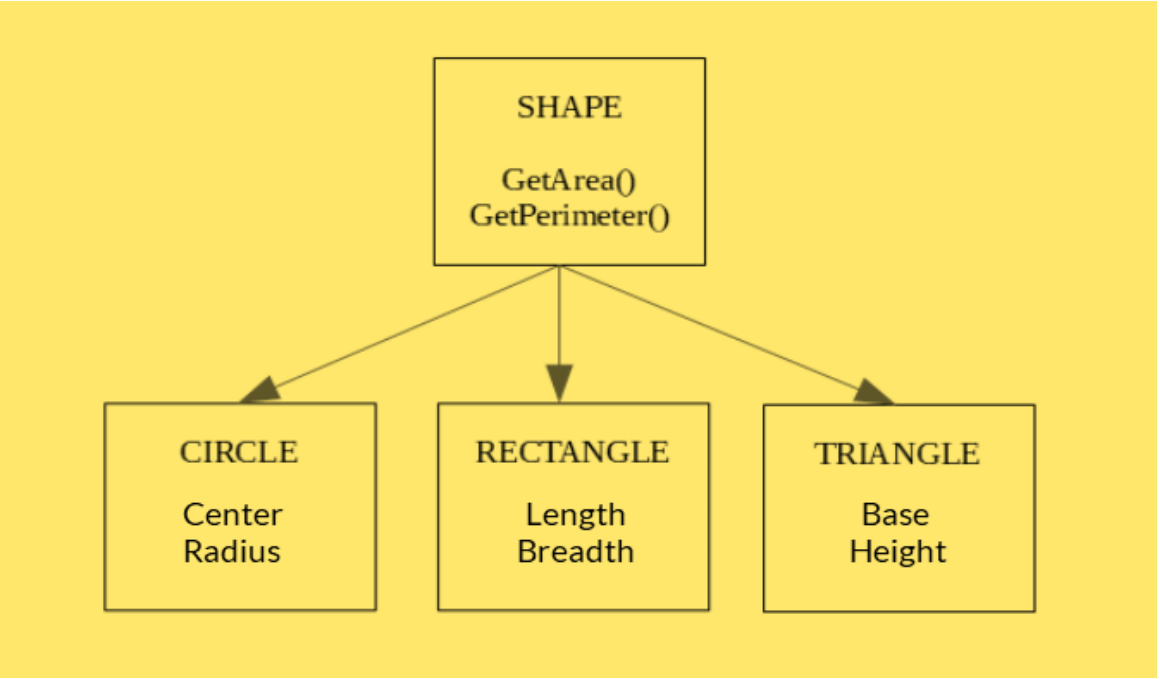
Entity-Relationship (ER) Model is based on the notion of real-world entities and relationships among them.

(ii) Object-Oriented Data Model

Object oriented data model is based upon real world situations.

These situations are represented as objects, with different attributes.

All these objects have multiple relationship between them.



Example of Object oriented Data Model

- Shape is the base object.
- Shape, Circle, Rectangle, Triangle – Objects
- Center, Radius – Attribute for Object circle
- Length, Breadth – Attribute for Object Rectangle
- Base, Height – Attribute for Object Triangle

2. Record based Data Model

Record base model is used to specify the overall structure of the database.

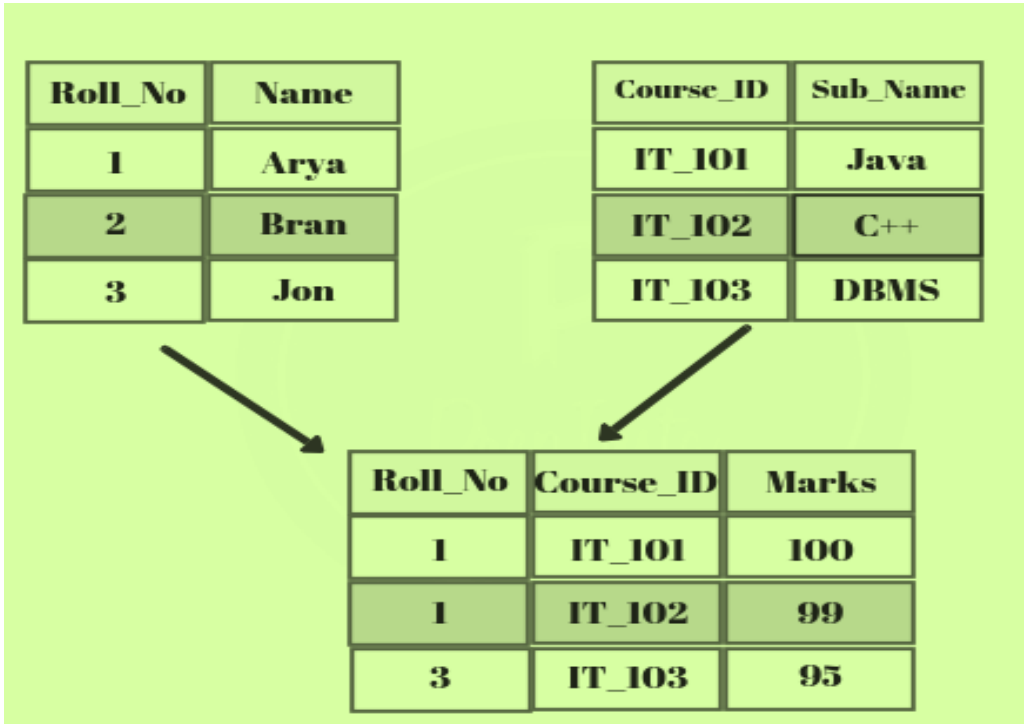
Each record type has fixed number of fields having the fixed length.

There are three types of data model

- Relational Model
- Hierarchical Model
- Network Model

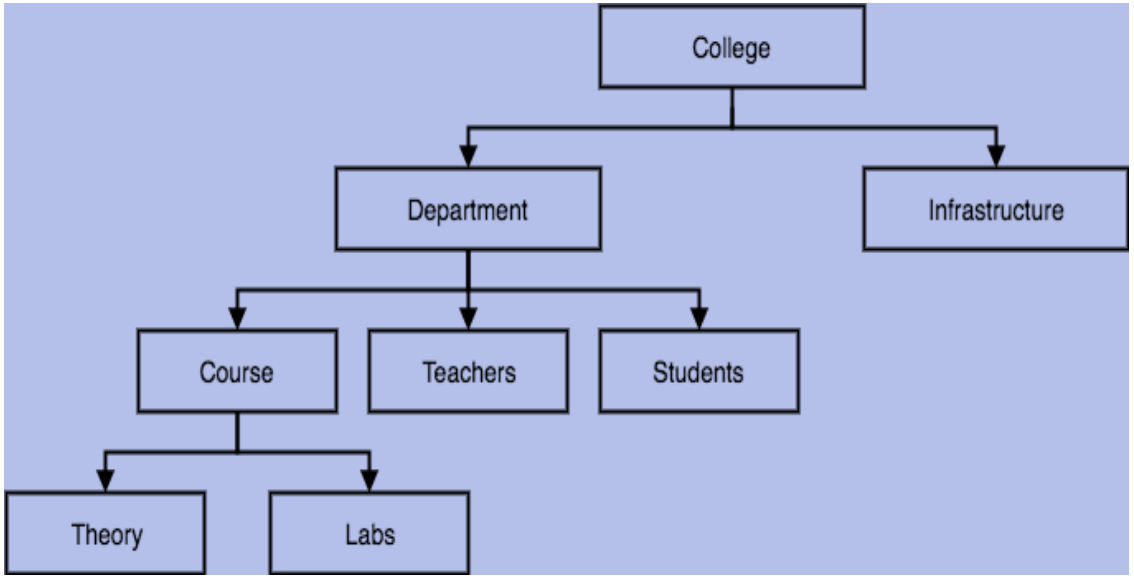
(i) Relational Data Model

- Relational Data Model uses tables to represent the data and the relationship among these data.
- It is a low-level model.



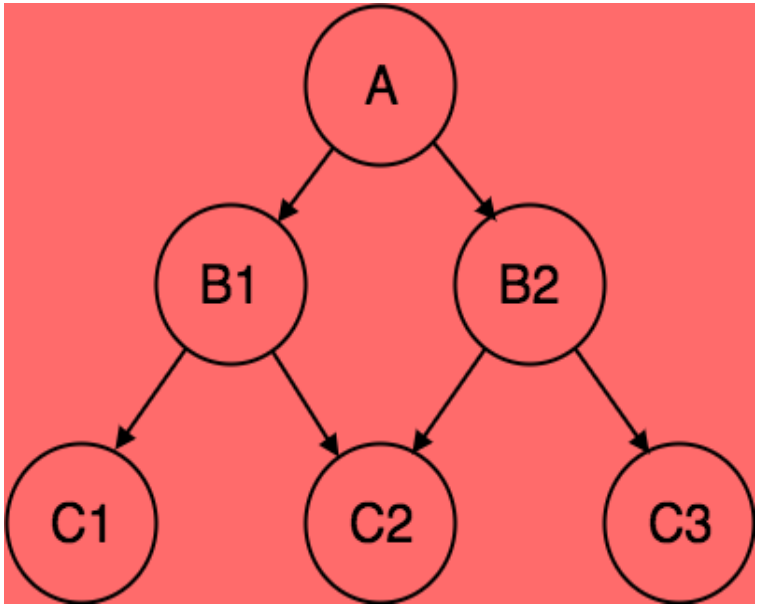
(ii) Hierarchical Data Model

- Data is organised into tree-like structure with one-to-many relationship
- The hierarchy starts from the Root data and expands like a tree, adding child nodes to the parent nodes.



(iii). Network Data Model

- Data is organised more like a graph, and are allowed to have more than one parent node.
- This database model was used to map many-to-many data relationships.



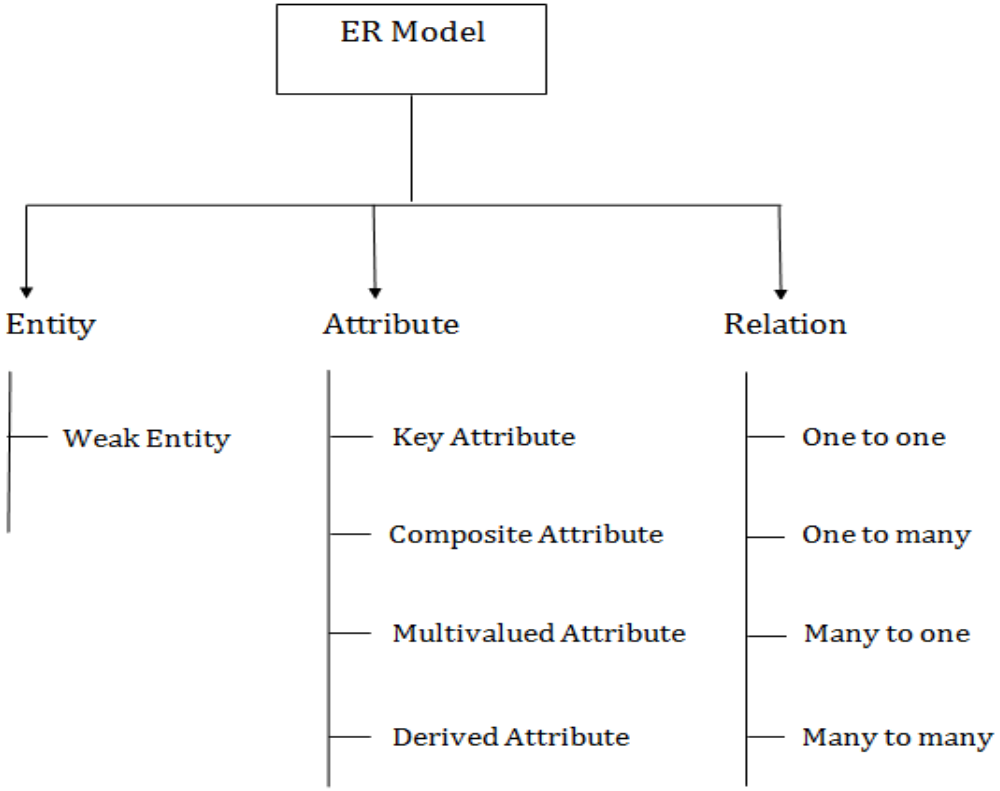
3. PHYSICAL DATA MODEL

Physical data model represents how the model will be built in the database.

ENTITY RELATIONSHIP MODEL (ER MODEL)

ER Model

- ER model stands for an Entity-Relationship model.
- It is a high-level data model.



1. Entity

An entity may be any object, class, person or place.
In the ER diagram, an entity can be represented as rectangles.

(i) Weak Entity:
An entity that depends on another entity called a weak entity.
The weak entity is represented by a double rectangle.

2. Attributes

The attribute is used to describe the property of an entity and Eclipse represent an attribute.

(i). Key attribute:

It represents a primary key and represented by an ellipse with the text underlined.

(ii). Composite attribute:

Represented by an ellipse, and those ellipses are connected with an ellipse.

(iii). Multivalued attribute:

The double oval is used to represent multivalued attribute and has more than one value

(iv). Derived attribute:

An attribute that can be derived from another attribute is known as a derived attribute.

It can be represented by a dashed ellipse.

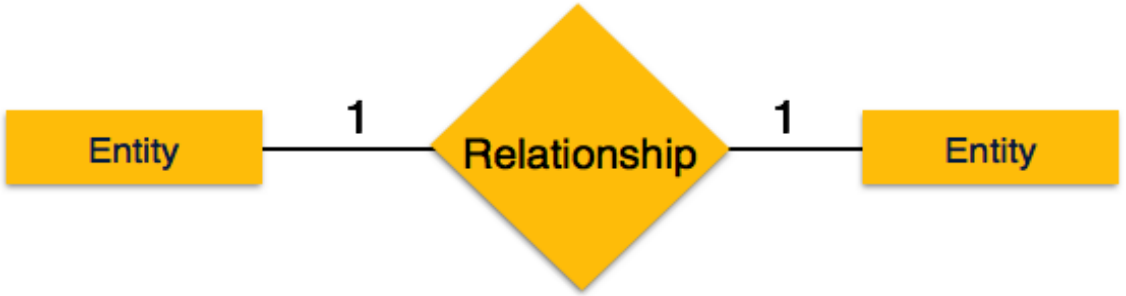
3. Relationship

Relationships are represented by diamond-shaped box.

Name of the relationship is written inside the diamond-box.

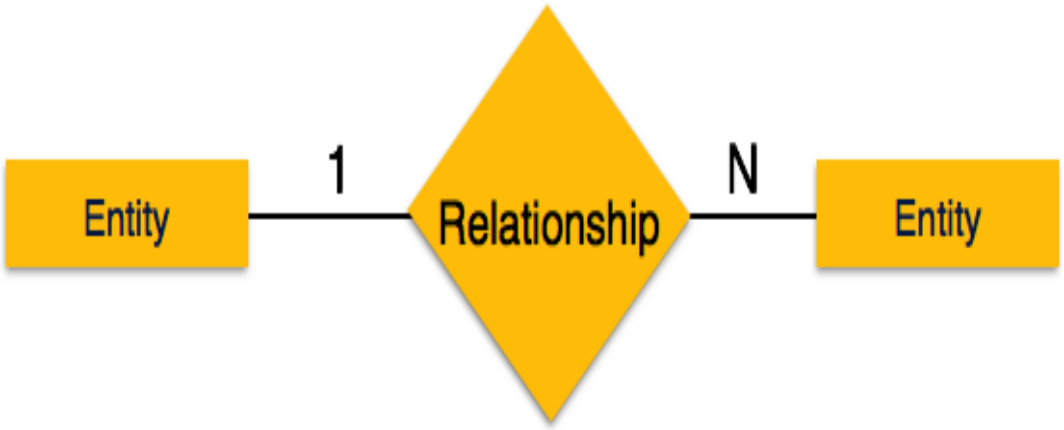
1.One-to-one:

When only one instance of an entity is associated with the relationship it is marked as 1:1



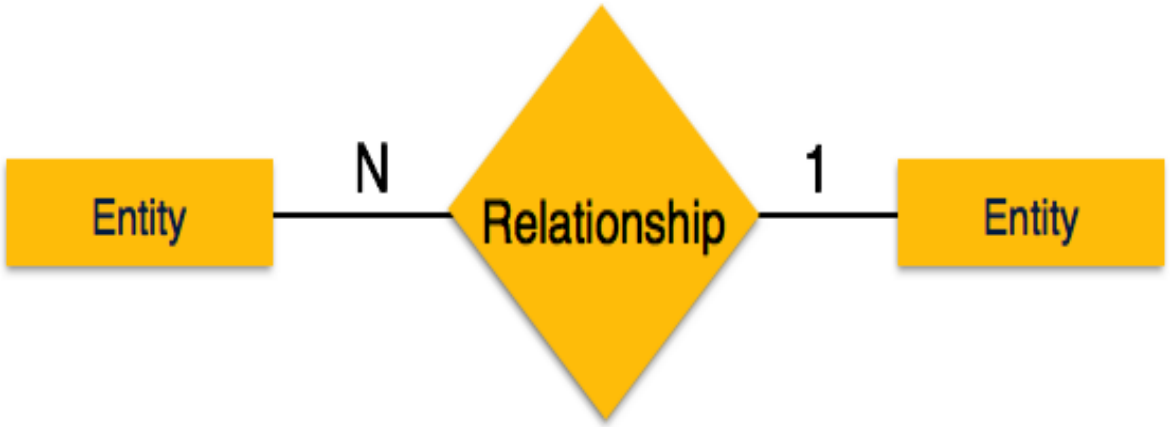
2. One-to-Many

When more than one instance of an entity is associated with a relationship it is marked as 1: N



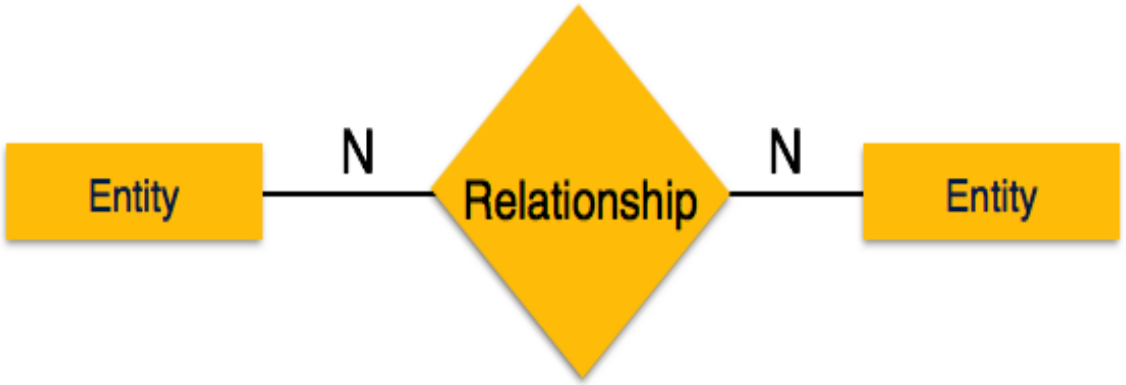
3. Many-to-One

When more than one instance of entity is associated with the relationship, it is marked as N:1

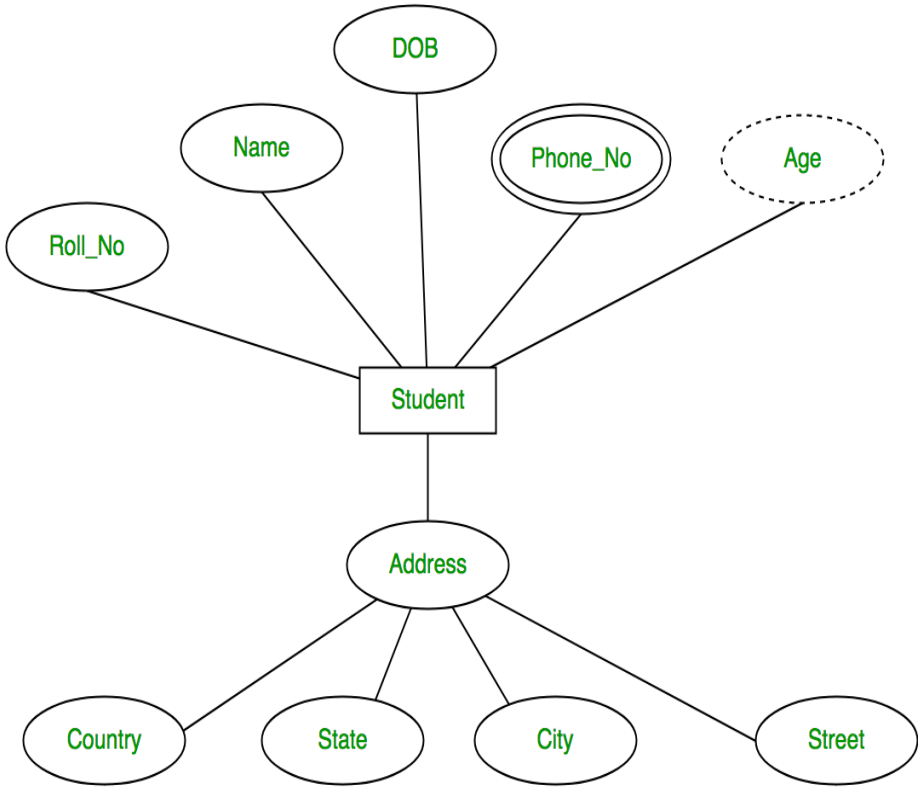


4. Many-to-Many

More than one instance of an entity on the left and more than one instance of an entity on the right can be associated with the relationship.



EXAMPLE FOR ENTITY RELATIONAL MODEL



THANK YOU