Data Models

--> A Database model defines the logical design of data.

-->This type of model designs the data in the form of ROWS and COLUMNS.

There are 3 types of Data Models.

a. Object Based Logical Models.
b. Record Based Logical Models.
c. Physicals Models.

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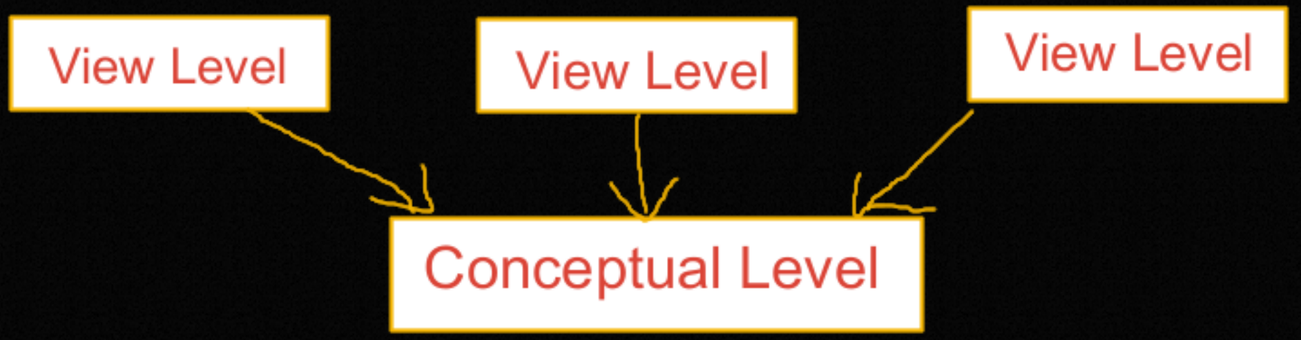
Object Based Logical Models.

--> Describe the Data at the conceptual and view level.
--> These Models having flexible structuring capabilities into following types:-

a. The Entity - Relationship model.
b. The Object - Oriented model.
c. The Semantic Data Model.
d. The Functional Data Model.



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Record Based Logical Models

--> Like Object based Model, they also describe Data at CONCEPTUAL level and VIEW level.

--> It has fixed no. of field or attribute in each record type.

These models are classified into:-

a. Relational Model.
b. Network Model.
c. Hierarchal Model.

Physical Models

--> It represents how the model will be built in the Database.
A Physical database shows all table structures including Column Names , Column Data type etc.

Syntax:- (column_name datatype, column_name2 datatype2,)
eg:-
("name" varchar(10) , Age int)

--> These Models can be classified into two types:-

a. Unifying model.
b. Frame memory Model.

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Relational Model

--> Relational Model represents how data is stored in relational database.

OR

--> It represent the database as a collection of relations.

--> Relational Database model stores data in the form of TABLES. (rows and columns.)
Each Row is known as TUPLE.

Name	Roll	Age
Raju	12	21
Shayam	15	22
Babu Rao	16	35

Attribute :- Attribute are the property that defines a relation.

eg. Name, Roll , Age

Relation Schema:-

A Relation Schema represent name of the reln. with its ATTRIBUTE.

eg. Student(Roll, Name, Age)

NOTE:-

1. Tupple = Each ROW of data.
2. Attribute = Each COLUMN in Tuple.
3. Cardinality = No. of TUPLES in a Relation.

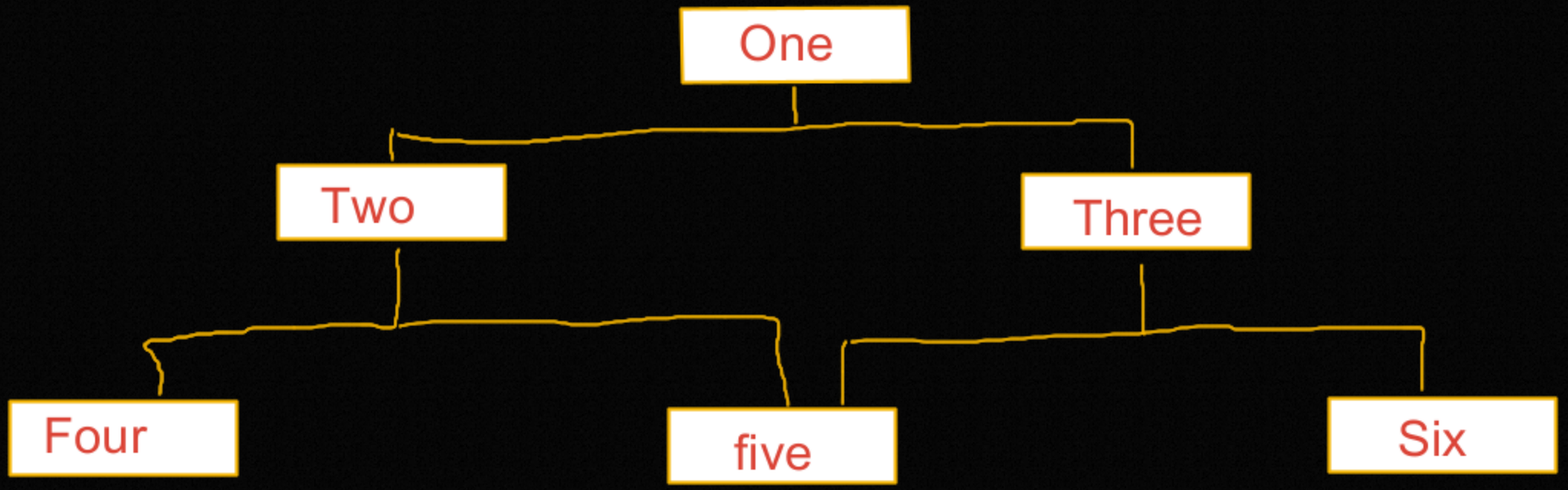
Network Model

--> A Network Model is a type of Database model that allows multiple records to be linked into the same Owner file.

It replace Hierarchical Tree with a Graph.

NOTE:-

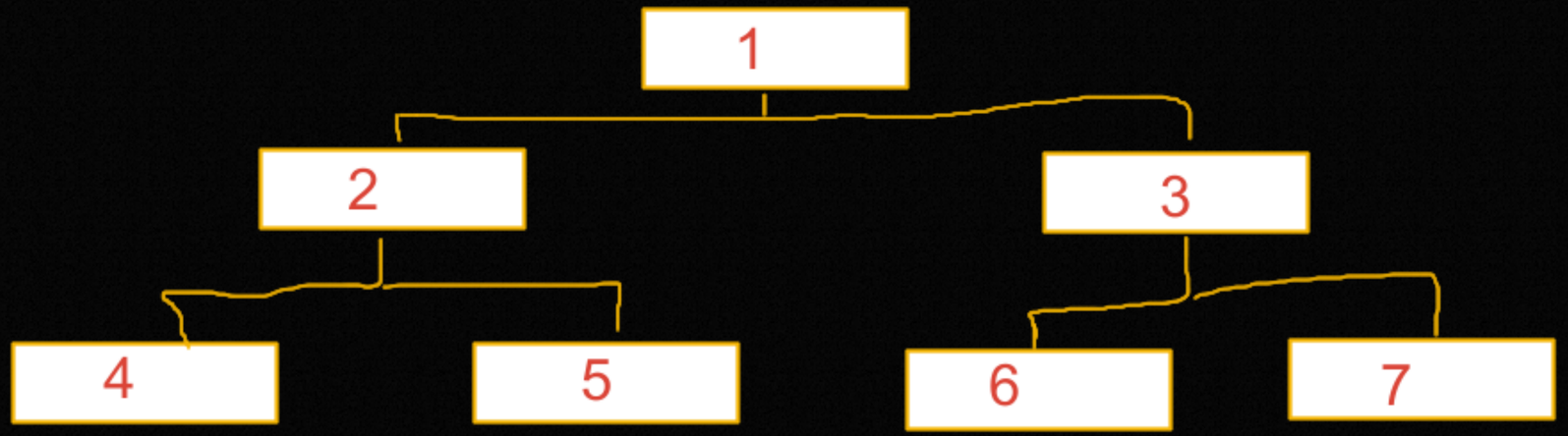
* In Network Model A CHILD can have more than ONE PARENTS.
* Network Model Consist One to One , One to Many and Many to One relationship



Hierarchical Model

--> A Hierarchical model is a data base model in which the Data are Organised into a Tree like Structure.

Each CHILD record has only ONE PARENT, whereas each PARENT record can have ONE OR MORE THAN ONE CHILD records.



NOTE:-

a. The Top- most NODE is called ROOT NODE.
b. Each NODE has exactly ONE PARENTS.
c. ONE PARENT have MANY CHILDREN.

Object Based Model

--> In Object Based Model,the Focus is on how the Data is represented.

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ER Model

E = Entity

R = Relationship.

--> ER Diagram is a Pictorial representation of Data that Describe how the Data is communicated & Related to each other.

NOTE:-

At View Level , The ER model is considered a good Option for Designing databases.

Entities:-

--> An Entity may be any Object, Class, Person or Place.

It is represented by 

eg. Students Projects

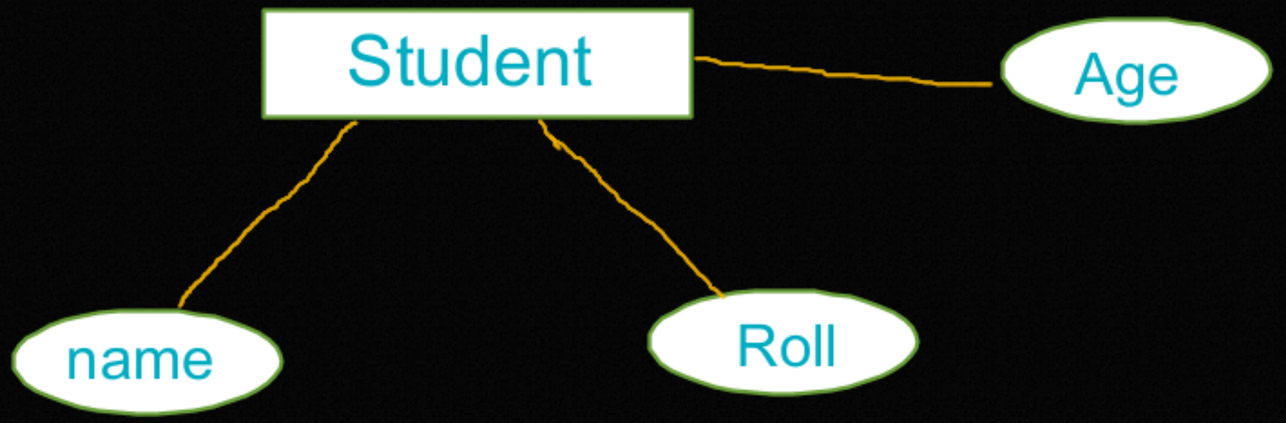
Attribute:-

--> Attribute are the property of ENTITIES.

It is represented by 

eg.

Roll Id Name



--> There are 5 types of Attribute :-

a. Simple Attribute.
b. Composite Attribute.
c. Single - Value Attribute.
d. Multi - Value Attribute.
e. Derieved Attribute.

a. Simple Attribute:-

An Attribute which can not be further sub-divide.

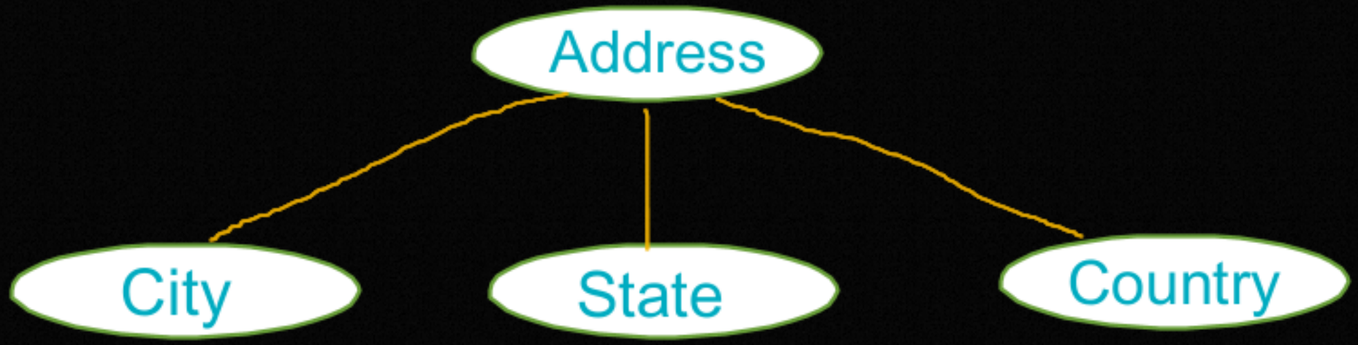
represent by

eg. Roll No. , I'd

b. Composite Attribute:-

It can be further Sub-Divided into other attribute.

eg. Address



c. Single - Value Attribute :-

Attribute which has only one value.

eg. I'd

d. Multi-Value Attribute :-

This Attribute has more than One Value.

represent by 

eg. Phone no.

{ Mobile No. , Whatsapp No. }

e. Derived Value :-

An Attribute that can be Derived from other Attribute.

represent by 

eg. D.O.B.

Relationship

--> In Relationship two or more Data sets are linked.

{ Relationship of similar type is Called Relationship Set }

represent by 

Degree of Relationship

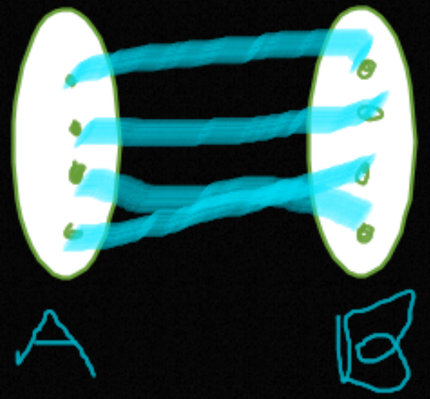
--> The No. of Entities type that participate in a relationship.

Cardinality

--> It defines the no. of Entity in One entity set.

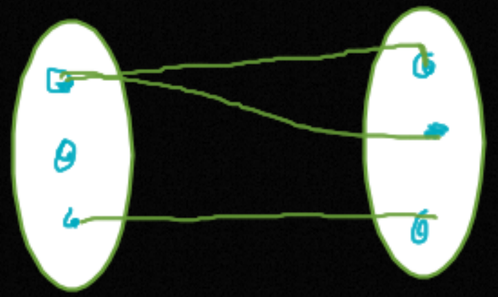
One to One :-

Each Row in one Table has only One related row in second Table.



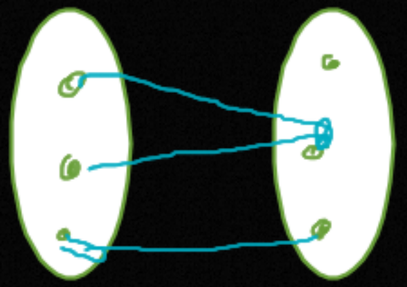
One to Many:-

One to Many means One Row in Multiple Row in another table.



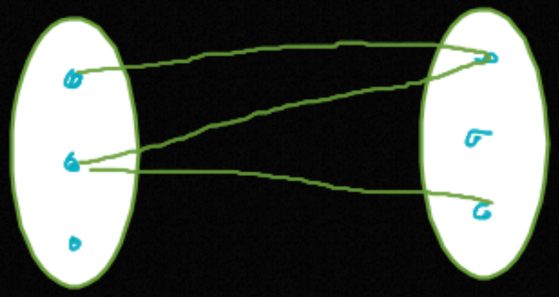
Many to One :-

More than one Entity from set A with atmost 1 entity of set B



Many to Many:-

One entity from A can be associated with more than one entity from B & vice-versa.



MCQ

1. An _____ is a set of entities of the same type that share the same properties, or attributes.
a) Entity set
b) Attribute set
c) Relation set
d) Entity model

2. Entity is a _____
a) Object of relation
b) Present working model
c) Thing in real world
d) Model of relation
View Answer

3. The attribute name could be structured as an attribute consisting of first name, middle initial, and last name. This type of attribute is called
a) Simple attribute
b) Composite attribute
c) Multivalued attribute
d) Derived attribute

MCQ

4. The attribute AGE is calculated from DATE_OF_BIRTH. The attribute AGE is
a) Single valued
b) Multi valued
c) Composite
d) Derived

5. Which of the following can be a multivalued attribute?
a) Phone_number
b) Name
c) Date_of_birth
d) All of the mentioned

Thank You

MCQ

6. Entity is a _____

A. Object of relation
B. Present working model
C. Thing in real world
D. Model of relation

7. E-R modeling technique is a :

A. Top-down approach
B. Bottom-up approach
C. Left-right approach
D. None of the above

8. Which of the following can be a multivalued attribute?

A. Phone_number
B. Name
C. Date_of_birth
D. All of the mentioned

MCQ

9. Which of the following is a single valued attribute?

A. Register_number
B. Address
C. SUBJECT_TAKEN
D. Reference

10. What do you mean by one to many relationships?

a. One class may have many teachers
b. One teacher can have many classes
c. Many classes may have many teachers
d. Many teachers may have many classes

11. Which one of the following refers to the copies of the same data (or information) occupying the memory space at multiple places.

a. Data Repository
b. Data Inconsistency
c. Data Mining
d. Data Redundancy

12. Which of the following refers to the level of data abstraction that describes exactly how the data actually stored?

a. Conceptual Level
b. Physical Level
c. File Level
d. Logical Level

13. The term "Data" refers to:

a. The electronic representation of the information(or data)
b. Basic information
c. Row Facts and figures
d. Both A and C

14. Which of the following refers to the number of tuples in a relation?

a. Entity
b. Column
c. Cardinality
d. None of the above

15. Which of the following refers to the number of attributes in a relation?

a. Degree
b. Row
c. Column
d. All of the above

16. Which one of the following refers to the total view of the database content?

a. Conceptual view
b. Physical view
c. Internal view
d. External view

17. The architecture of a database can be viewed as the _____

a. One level
b. Two-level
c. Three-level
d. Four level