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Data Modeling Part-1

Content :-

1. **Entities**
2. **Attributes**
3. **Degree of Relation**
4. **Cardinality**
5. **Relationship Constraint**

Entities:-The basic object that the ER model represent is an entity, which is a thing in the real world with an independent existence. An entity may be an object with a physical existence(for example , a particular person, car , house or employees) or it may be an object with a conceptual existence(for example ,a company, a job or a university course) .

Attribute :- Each entity has attributes – the particular properties they describe it. For example, an employee entity may be described by the name , age ,address, salary , and job . A particular entity will have a value for each of its attributes . The attributes values they describe each entity become a major part of data stored in the database.

Attributes:-

Composite Verse Simple(Atomic) Attribute : Composite attribution can be divided into smaller subparts, which represent more basic attributes with independent meanings . For example ,the address of the employee entity can be subdivided into street address , city , state ,and zip . Attributes that are not divisible are simple or atomic attributes.

Single-value versus Multi-valued Attributes :-Most Attributes have a single value for a particular entity such attributes are called single-valued. For example, age is a single-

valued attribute of a person. One may not have a college degree another person may have one, and a third person may have two or more degrees, therefore different person can have different numbers of values for the college degree attributes . Such attributes are called multi valued .

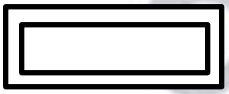
Stored versus Derived Attributes :-In some cases , two(or more) attribute value are related - for example , the age and Birth-date attributes of a person . For a particular entity , the value of age can be determined the current (today's) date and the value of that person Birth date. The age attribute is hence called a derived attribute and is said to be derivable from the Birth date attribute , which is called a stored attribute.

NULL Value:-In somecases , a particular entity may not have an applicable value for attribute. A college_degree attributes applies only to person with college degrees. For much situation a special value called NULL is created .

Complex Attributes :- we can represent arbitrary nesting by grouping component of a composite attribute between parentheses and separating the components with commas and by displaying multi-valued attributes braces. Such attributes are called complex attributes. For example, if a person can have more than one residence and each residence can have a single address and multiple phones . (Composite + Multivalued) .

Degree of Relationship Sets :-

Degree of a Relationship set refers to the number of Entity Sets participating in the Relationship. Most of the relationships are binary.

ER Notation		
Symbol	**Shape**	**Meaning**
	Rectangle	Represent an entity set
	Ellipse	Represent an attribute
	Diamond	Represent a relationship set
	Line	Links an attribute to an entity set or an entity set of a relation set
	Double Line	Indicates total participation of an entity set
	Double Ellipse	Indicate multi-valued attribute
	Double Rectangle	Indicate week entity set
	Double Diamond	Indicates a relationship set with partition of some weak entity sets
	Dashed Ellipse	Indicates Derived attribute

Notes: Multivalued Attribute is enclosed in{ } and composite attribute is enclosed in ().

Relationship

Relationship Degree :- The degree of relationship type is number of participating entity types . A relationship type of degree two is Known as binary, and one of degree three is called ternary. We can also say that number of entities participating in the relation

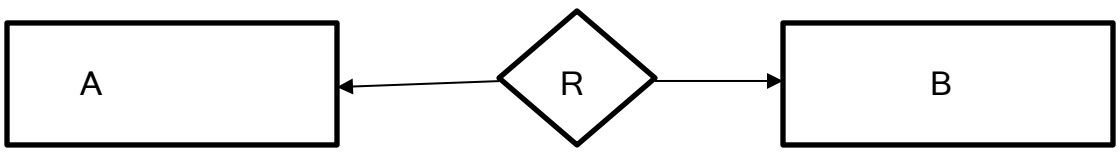
Cardinality Ratios for Binary Relationship:-The cardinality ratio for the binary relationship specifies the maximum numbers of relationship instance that an entity can participate in. The possible cardinality ratios for binary relationship types are 1:1,1:N,M:N.

Relationship Constraints :-

a. Mapping Cardinalities
b. Participation Cardinalities

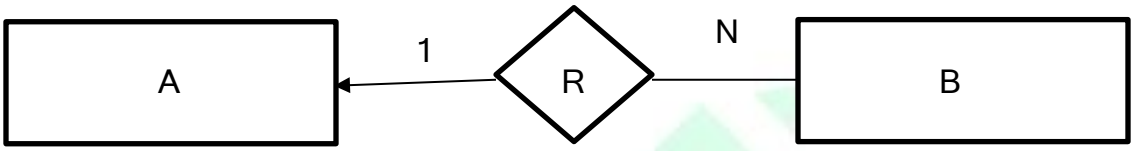
Mapping Cardinalities

1. **One-to-One :-** An entity in A is associated with at most one entity in B and an entity in B is associated with at most one entity in A. It is represented in ER as follows :-



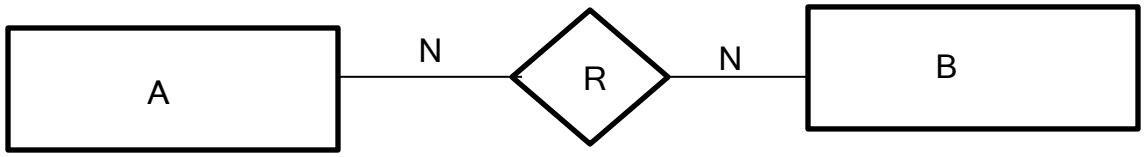
One-to-one cardinality is represented by directly lines drawn from R to both A and B.

2. **One -to- Many :-** One to many cardinality from A to B implies than entity in A is associated with any number(Nil/one/many) of entities in B. however, an entity in B is associated with at most one entity in A .ER representation is as follows :



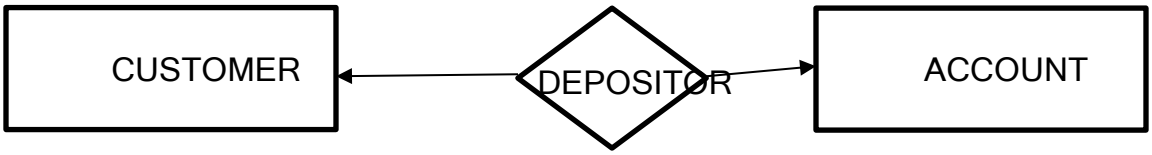
3. **Many-to-One :-** Many to one cardinality from A to B implies that an entity in A is associated with at most one entity in B ; however ,one entity in B can be associated with any number of entities in A. It is represented in ER model as follows :-

4. **Many-to-Many :-**Many to many cardinality from A to B implies that an entity A can be associated with any number of entities in B and one entity in B can be associated with any number of entities in A. It is represented in ER model as follows :



Example :-

One-to-one relationship from CUSTOMER to ACCOUNT implies each customer can have only one account and each account has to be single.



One-to-Many relationship from CUSTOMER to ACCOUNT implies that each customer can have any number (NIL or one or more than one) of accounts but each account has to single.

Many-to-one relationship from CUSTOMER to ACCOUNT implies that each customer can have only one accounts , but account can be join (held by one or more)

Many-to-Many relation from CUSTOMER to ACCOUNT implies that each customer can have any number (Nil or one or more than one) accounts and each account can be Joint (held by one or more)

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