Data Modeling Part-2

Content:-
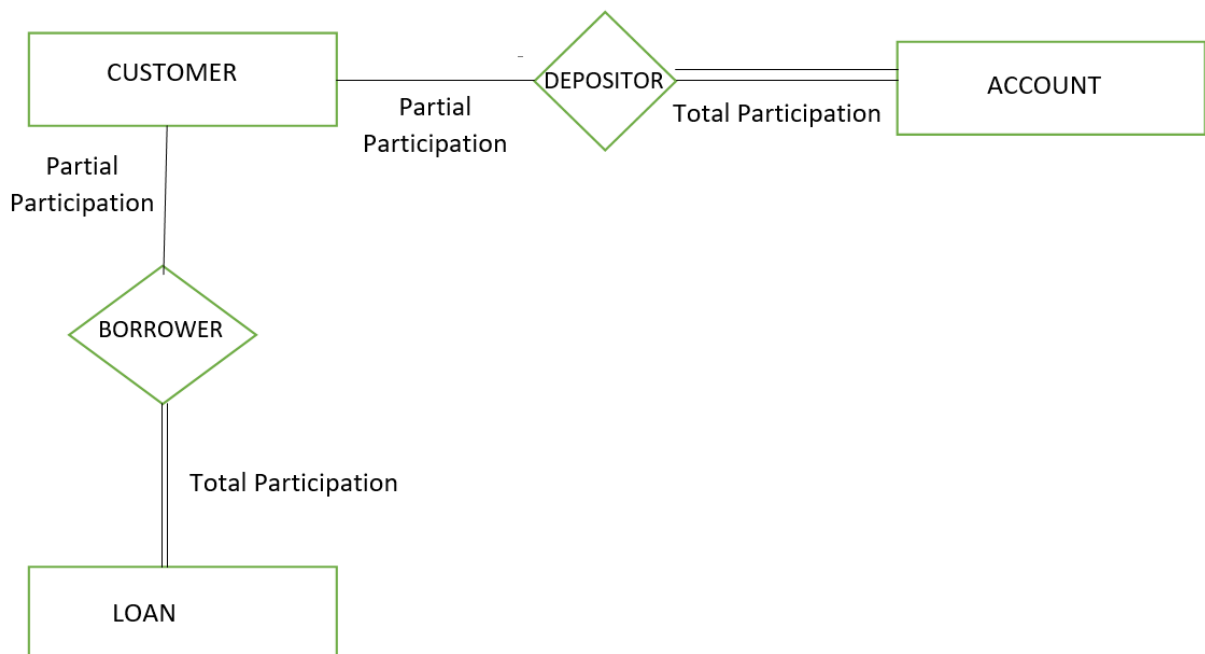
1. **Participation Constraint**
2. **Keys**

Participation constraints in Relationship Sets

a. **Total Participation**
b. **Partial Participation**

a. **Total Participation:-**An Entity Set E is said to have total participation in relationship set R if each entity in E is participating at least one relationship through R in ER diagram , the total participation is represented by a "Double Line" drawn between the entity set symbol and the relationship set symbol **.**

b. **Partial Participation :-** An Entity Set E is said to have partial participation in relationship set R if some of the entities in E are not participating in any relationship through R. In ER Diagram , the partial participation is represented by a "Single Line" drawn between Entity Set symbol and Relationship Set Symbol .
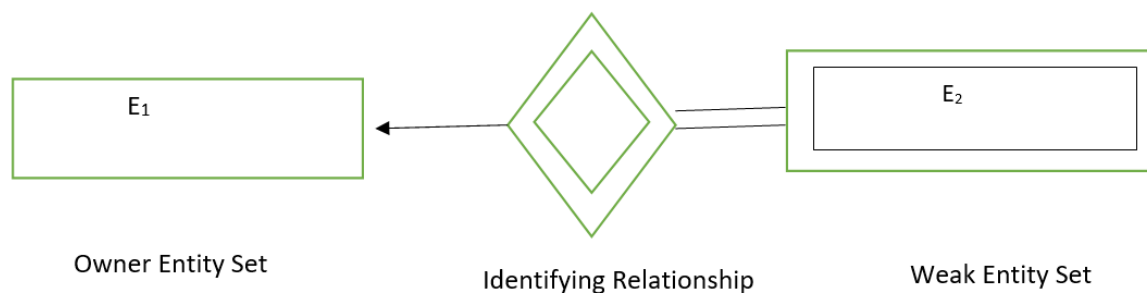
For Example :-

Suppose Entity Sets "Customer " and "ACCOUNT" are released by Relationship Set "DEPOSITOR" and Entity Sets "CUSTOMER" and "LOAN" are related by Relationship Set "BORROWER". Suppose it is possible that a customer may have only account or only loan or both, then the situation can be modelled as follows :-
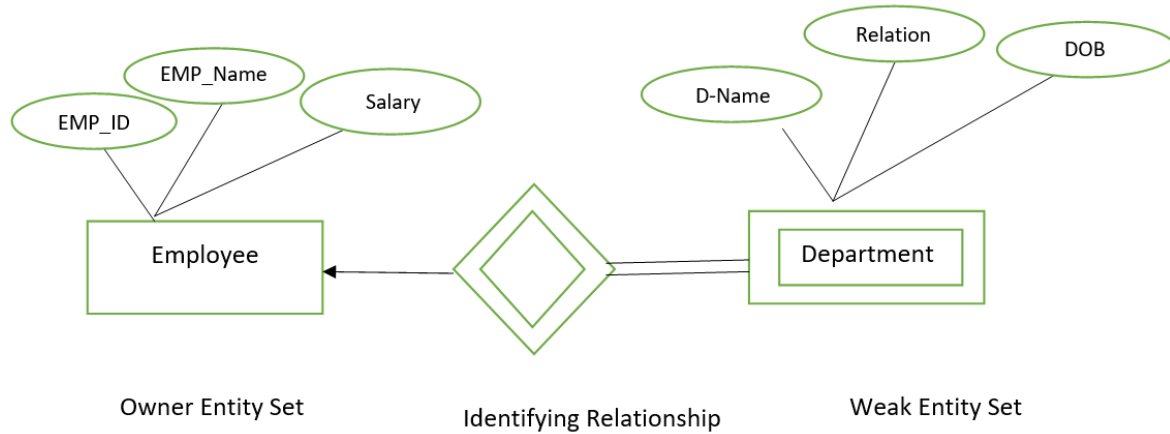
Concept of Keys :-

    a. **Super Key :-** A super of entity set or Relationship set refers to the set of attributes which when taken collectively, will uniquely determine each entity within the entity set or a relationship within the relationship set. If K forms a Super Key (SK) of an entity set E then any super set of K will also be super Key of E. So, a super key may have some extraneous (unnecessary) attributes, which if removed , the balance set still form a super key of R. **Example :-** Suppose each student in the entity set STUDENT(ROLL NO, NAME, BRANCH,FATHERS-NAME, ADDRESS, DOB, TEL-NO) has a unique value ROLL-NO . This implies that no two students can have same ROLL-NO then {ROLL-NO, NAME} forms a super key of Entity Set STUDENT. In this attribute NAME is extraneous; which is removed, the balance set i.e. {ROLL-NO} still form a Super Key of Student.

    b. **Candidate Key :-** A super Key, whose no proper subset forms a Super Key is called candidate key. Thus candidate key is a minimal super key (i.e. a Super Key having no extraneous attributes). A entity set may have more than one candidate Keys.
        Example :- The entity set STUDENT will have at least two candidate keys i.e. {ROLL-NO} and {FATHER-NAME,DOB,ADDRESS} .

    c. **PRIMARY Key :-** Primary Key is one of the candidate keys that is designated by the database designers as primary means of identifying entities within an entity set. In the ER diagram, the primary key attributes are underlined with firm line.

Concept of Weak Entity Set:- An entity set is said to be a **weak entity** set if it does not have sufficient attributes to form its primary key. On the other hand, an entity set having a primary key of its own is called **strong entity set** . A Weak entity set (say E_2) will be dependent from its existence on a strong entity Set Say(E_1) to form its **candidate key**. Then Entity Set E_2 said to be "Existence-Dependent" on E_1 and E_1 is said to be the "Owner Entity Set" of E_2. The relationship R between E_1 and E_2 is called **"Identifying Relationship"** . The Weak Entity Set E_2 will have a set of attributes called its **"Discriminator".**, which together with primary key of E_1 will form the Primary key of E_2.

    Owner Entity Set   Identifying Relationship   Weak Entity Set

Example :- suppose an entity set EMPLOYEE(EMP_ID,EMO_NAME,SALARY,DEPARTMENTS) has an attribute DEPARTMENT which is multi-valued i.e. an employee may have none or one or more than departments.

Owner Entity Set   Identifying Relationship   Weak Entity Set

Special Feature of an Identifying Relationship Set:

Normally, a situation modelled by Weak Entity Set will have following Feature:

a. The identifying Relationship will be one-to-many form Owner Entity Set to Weak Entity Set.
b. The participation of Owner Entity Set in the Identifying Relationship will be partial and participation of the Weak Entity Set in the Identifying Relationship will be total.

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