Experiment No.: 02

Title: To Map EER diagram drawn in experiment no.1 to relational model.

Batch: B1 **Roll No.: 1914078** **Experiment No.: 02**

Aim: To Map EER diagram drawn in experiment no.1 to relational model.

Resources needed: MS-office

Theory:

The relational model uses collection of tables to represent both data and the relationships among those data. Each table has multiple columns and each column has a unique name. The relational model is an example of record-based model. Each table contains records of a particular type. The columns of the table correspond to the attributes of the record type. The relational model is the most widely used data model.

Procedure / Approach /Algorithm / Activity Diagram:

Steps for Reducing EER model into relational model

1) Any strong entity set E having attributes a1, a2,…,an is reduced into a relation schema called E with n distinct attributes i.e. a separate relation with name E and n distinct columns.

2) Any weak entity set A having attributes a1, a2,..n and a strong entity set B on which A depends, having primary key attributes as b1, b2, …, bn is reduced into a relation schema called A with one attribute for each member of set
{ a1, a2,…, an} U {b1, b2, ……. , bn}

3) Any relationship set R having a1,a2,…,an as a set of attributes formed by union of the primary keys of each of the entity sets participating in R and b1, b2,….,bn as set of descriptive attributes is reduced into a relation schema called R with one attribute for each member of the set {a1, a2, …. ,an} U {b1, b2, …., bn}

Primary key of relationship set is decided as follows

For **binary many to many relationships** the union of primary key attributes from the participating entity sets is primary key.

For **binary one to one relationship set** the primary key of either of the participating entity set can be chosen as the primary key.

For **binary many to one or one to many relationship set** the primary key of the entity set on the many side of the relationship set serves as the primary key.

For **n-ary relationship sets without any arrows on its edges**, union of the primary key attributes of participating entity sets is a primary key.

For **n-ary relationship sets with an arrows on one of its edges**, union of the primary key attributes of participating entity sets is a primary key.

To remove redundancy we generally make separate relation schema for many to many relationship set with primary key and other attributes as mentioned above.

For one to one we combine relation schema of relationship set with relation schema of either sides of entity sets relation schema.

For one to many and many to one we combine relation schema of relationship set with relation schema of entity set on many side entity set.

We don't make separate relation schema for identifying relationship set.Every composite attribute A having subparts a1, a2,…,an is represented by separate column for each subpart in relation schema of the associated entity set.

For **multivalued attribute** separate schema is form having columns as attributes of primary key of associated entity set and a column for multivalued attribute

For **overlapping generalization/specialization** create separate relation schemas for higher level as well as lower level entity sets.
Also include the foreign key constraint in lower level entityset for the primary key attributes of higher level entity set.

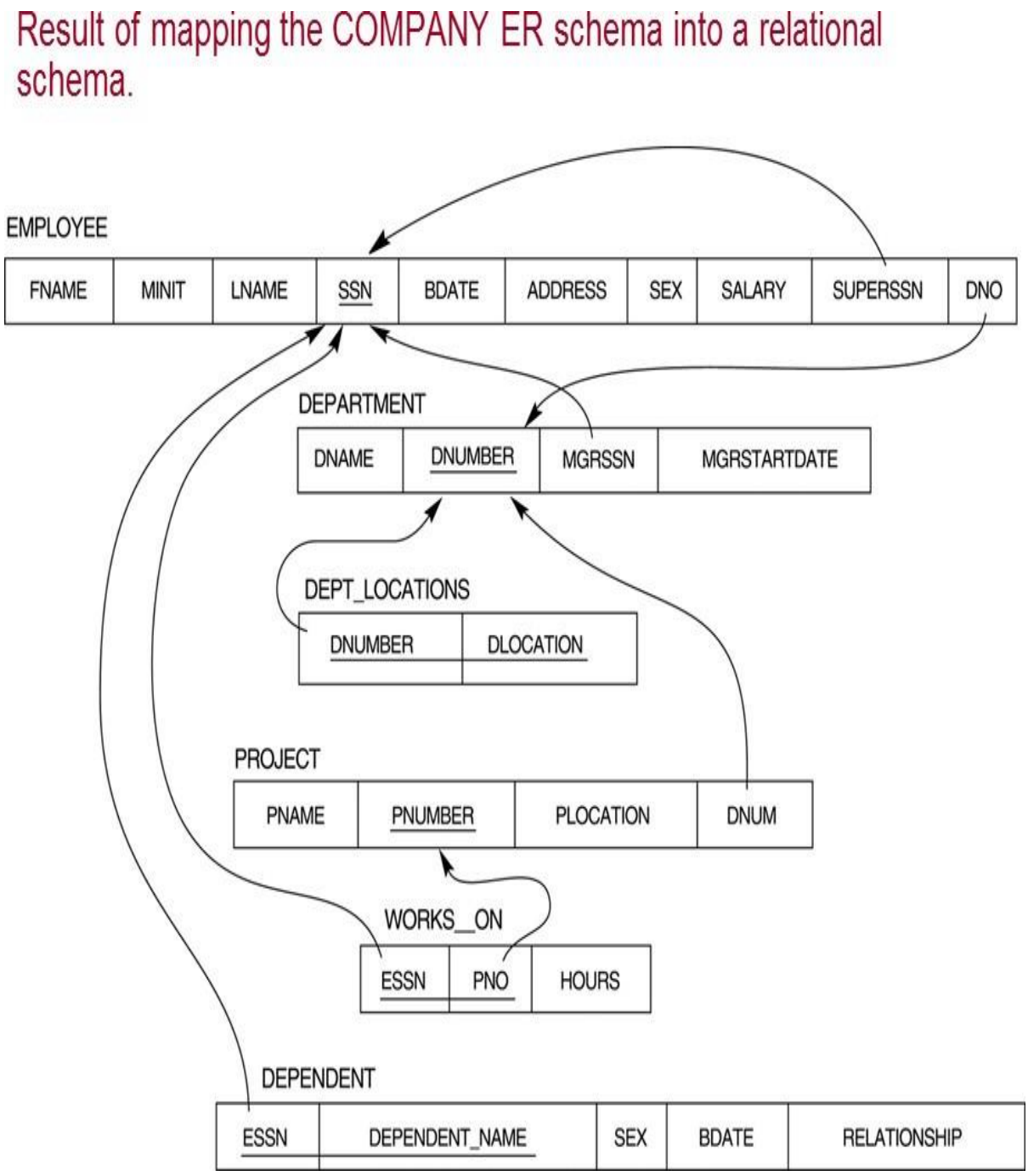
For **disjoint generalization/specialization** create separate relation schemas only for every lower level entity set(higher level entity set's attributes are inherited so add columns for same) and not for higher level entity set.

No separate relation is required to represent the **aggregation** the relation created from the defining relationship is used instead (design schema for relationship set treated as entity set carefully)

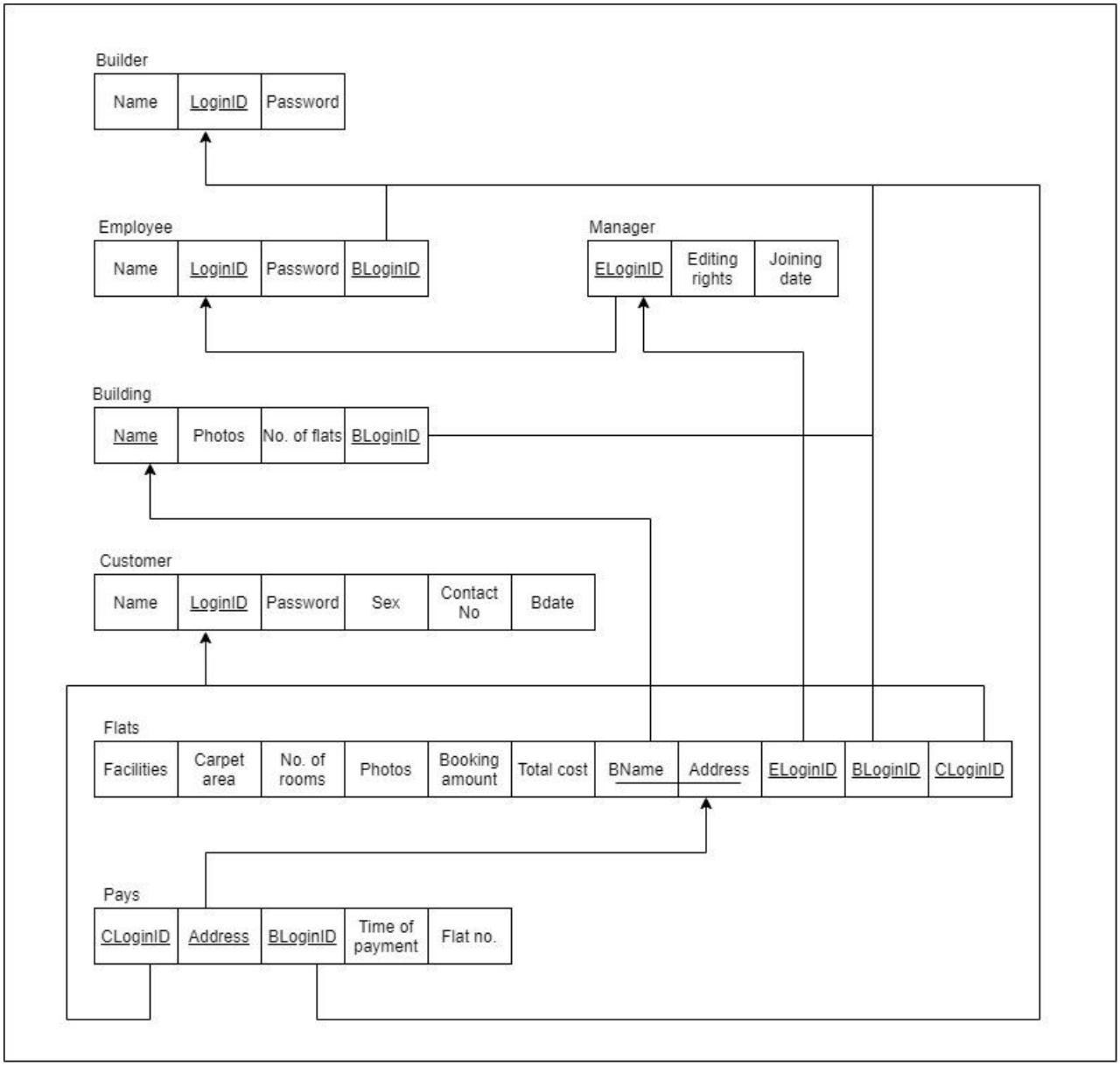
Results: (Document printout/handwritten)

1. Relational model

Example:



Relational Model for Property Management System:



Outcomes: Apply data models to real world scenario

Questions:

Q1 Explain generalization and specialization with example

A1: Generalization is the process of extracting shared characteristics from two or more classes, and combining them into a generalized superclass. Shared characteristics can be attributes, associations, or methods.

Example:-

Consider two entities Student and Patient. These two entities will have some characteristics of their own. For example Student entity will have Roll_No, Name and Mob_No while patient will have PId, Name and Mob_No characteristics. Now in this example Name and Mob_No of both Student and Patient can be combined as a Person to form one higher level entity and this process is called as Generalization Process.

Specialization means creating new subclasses from an existing class. If it turns out that certain attributes, associations, or methods only apply to some of the objects of the class, a subclass can be created. Specialization is a top-down approach in which a higher-level entity is divided into multiple specialized lower-level entities.

Example:-

Consider an entity Account. This will have some attributes consider them Acc_No and Balance. Account entity may have some other attributes like Current_Acc and Savings_Acc. Now Current_Acc may have Acc_No, Balance and Transactions while Savings_Acc may have Acc_No, Balance and Interest_Rate henceforth we can say that specialized entities inherits characteristics of higher level entity.

Q2 what is physical and logical data independence in DBMS.

A2: Physical data independence is the ability to modify the physical schema without causing application programs to be rewritten. Modifications at the physical level are occasionally necessary to improve performance.

Logical data independence is the ability to modify the logical schema without causing application program to be rewritten. Modifications at the logical level are necessary whenever the logical structure of the database is altered. Logical Data independence means if we add some new columns or remove some columns from table then the user view and programs should not change.

Conclusion: We Mapped EER diagram drawn in experiment no.1 to relational model.

Reference books:

1. Elmasri and Navathe, "Fundamentals of Database Systems", 6th Edition, Pearson Education
2. Korth, Slberchatz,Sudarshan, :"Database System Concepts", 6th Edition, McGraw – Hill