THADOMAL SHAHANI TSEC ENGINEERING COLLEGE

EXPERIMENT - 1

Aim: Identify the case study & detail statement of problem. Design an Entity Relationship (ER) / Extended Entity Relationship (EER) model.

Theory:

About gym management system:

Gym management system is a software that will maintain the database for a gym. It will be able to store the details about the clients, trainers, membership plans, the owner & other essential entities. The schema will have entities & their tables with the columns representing the attributes of those entities & some constraints to maintain the integrity of the database.

ER diagrams:

ER diagram stands for Entity Relationship diagram. It is a high level data model. It is used to define the data elements & relationship for a specified system.

It develops a conceptual design for the database. It also develops a very simple & easy to design view of data

In the ER diagram or model, the database structure is portrayed as a diagram called an entity-relationship diagram.

For example, suppose we design a school database

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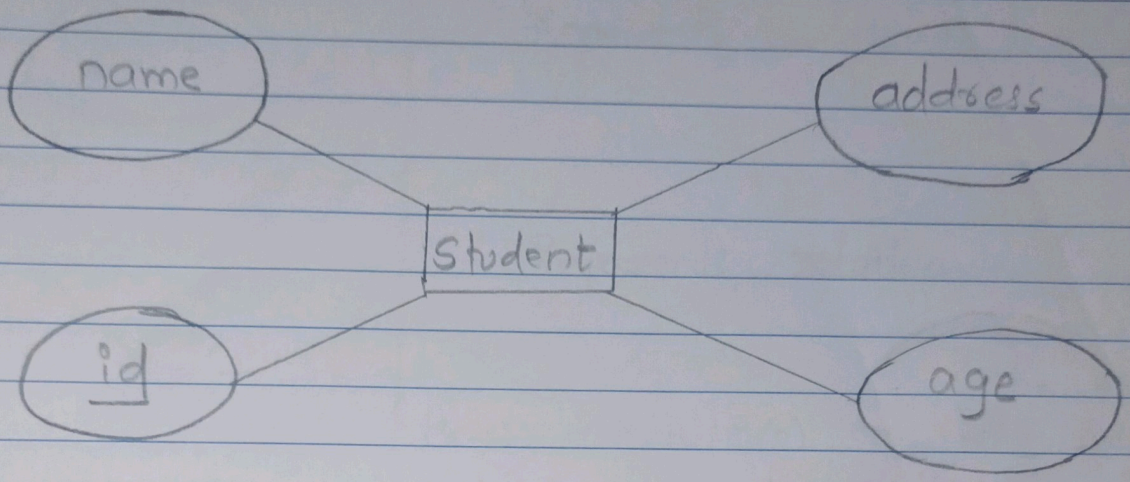
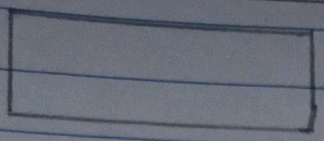
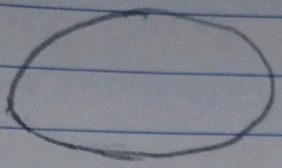
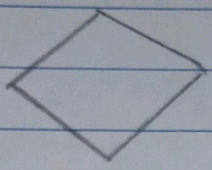
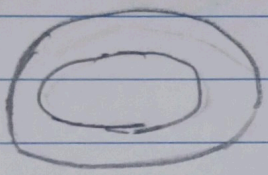
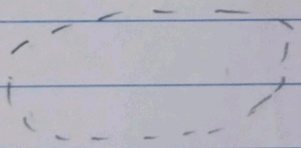
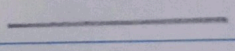
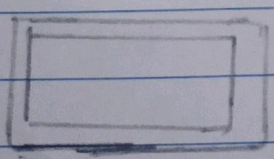
In this database, the student will be an entity with attributes like address, name, id, age, etc. The address can be another entity with attributes like city, street name, pin code, etc & these will be a relationship between them.

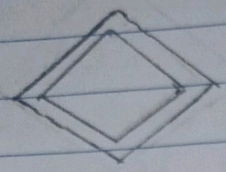
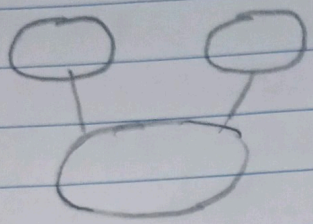
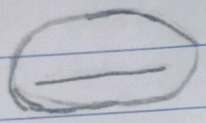


The above is the representation of the entity student along with it's attributes.

The ER diagram consists of the following things, mainly:

i) Entity
ii) Attribute
iii) Relation

Symbol	Meaning
	Represents entity
	Represents attribute
	Represents relation
	Links attribute(s) to entity set(s) or entity set(s) to relationship set(s)
	Represents multivalued attribute
	Represents derived attribute
	Represents total participation of entity
	Represents weak entity

Symbol	Meaning
	Represents weak relationship
	Represents composite attributes
	Represents key-valued & single-valued attributes

The above table is the symbols used in ER diagroms along with what they represent respectively.

Experiment. 2

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Aim: Mapping ER/EER to Relational schema model.

Theory:

Relational schema:

Relational schema is a set of relational tables & associated items that are related to one another. All of the base tables, columns, stored modules the user creates to fulfill the data needs of a particular enterprise or set of applications belong to one schema.

An ER diagram of a system can be converted into relational models which can directly be implemented by any RDBMS.

Steps to mapp a relational schema using an ER diagram:

Step 1: Mapping of Regular entity types.

For each regular (strong) entity type E in the ER schema, create a relation R that includes all the simple attributes of E. Choose one of the key attributes of E as the primary key of R.

If the chosen key of E is composite, the set of simple attributes that form it will together form the primary key of R.

Step 2: Mapping of Weak entity types.

For each weak entity type W in the ER schema

with owner entity type t, create a relation R & include all simple attributes of W as attributes of R. Also, include as foreign key attributes of R the primary key attributes of the relation(s) that correspond to the owner entity types.

Step 3: Mapping of Binary 1:1 Relation types.
For each binary 1:1 relationship type R in the ER schema, identify the relations S & T that correspond to entity types.
The 3 possible approaches:
i) Foreign key approach: Choose one type of the relation - say S & include the foreign key in S, the primary key of T.
ii) Merged relation option: An alternative mapping of a 1:1 relationship type is possible by merging two entity types & the relationship into a single relation
iii) Cross-reference or relationship relation option: The third alternative is to set up a third relation R for the purpose of cross-referencing the type primary keys of the two relations S & T representing entity types.

Step 4: Mapping of binary 1:N relationship types.
For each regular binary 1:N relationship type R, identify the relation S that represent the participating entity type at the N-side of the relationship type.

Step 5: Mapping of Binary M:N relationship types.
For each regular binary M:N relationship type R, create a new relation S to represent R

Include as foreign key attributes in S the primary keys of the relations that represent the participating entity types; their combination will form the primary key of S. Also include any simple attributes of M:N relationship type

Step 6: Mapping of multivalued attributes.
For each multivalued attribute A, create a new relation R. This relation R will include an attribute K as foreign key in R of the relation that represents the entity type of relationship type that has A as an attribute. If the multivalued attribute is composite, ie include its simple components.

Step 7: Mapping of n-ary relationship types.
For each n-ary relationship type R, where n > 2, create a new relationship S to represent R. Include as foreign key attributes in S the primary keys of the relations that represent the participating entity types. Also include any simple attributes of the n-ary relationship type.