Department Of Information Technology

A.Y. 2023-24
Class: SE-ITA/B, Semester: III

Subject: **Structured Query Lab**

Experiment – 1 A:Formulate a problem statement for the chosen real life application.

1. **Aim: To** Formulate a problem statement for the chosen real life application.

2. **Objective:** After performing the experiment, the students will be able to Formulate a problem statement for the chosen real life application
   Identify Entities and related features needed for an application

3. **Outcome**L302.1: To Construct problem definition statements for real life applications
4. **Prerequisite:** Understanding of use of databases in real time applications.

5. **Requirements:**.PC and Internet,Microsoft Word,Draw.io

6. **Laboratory Exercise:**
   Problem statement - Design a problem statement in order to understand the proposed system concisely.

7. **Post Experimental Exercise-**

A. **Questions:**
   1. What are the advantages of storing data in database?
   2. Write notations of Entity Relationship Diagram.
   3. What is the need of a database?

B. **References:**

[1] Elmasri and Navathe, "Fundamentals of Database Systems", 5th Edition, PEARSON Education.

[2] Korth, Silberchatz, Sudarshan, "Database System Concepts", 6th Edition, McGraw – Hill

Experiment – 1 B: Construct an ER/EER diagram

1. **Aim: To** Construct and ER/EER diagram and design a relational model for the chosen system using open source tool.

2. **Objective:**Define problem statement and Construct the conceptual model for real life application. The students should be able to clearly identify attributes, entities
- Understand Cardinality
- Identify and apply concepts of Generalization, Specialization and Association

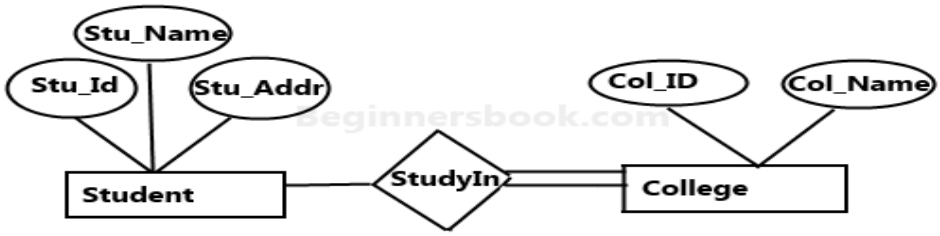
3. **Outcome:** L303.1: Define problem statement and Construct the conceptual model for real life application

4. **Prerequisite:** Understanding of entities, attributes and relationship.

5. **Requirements: Draw.io**

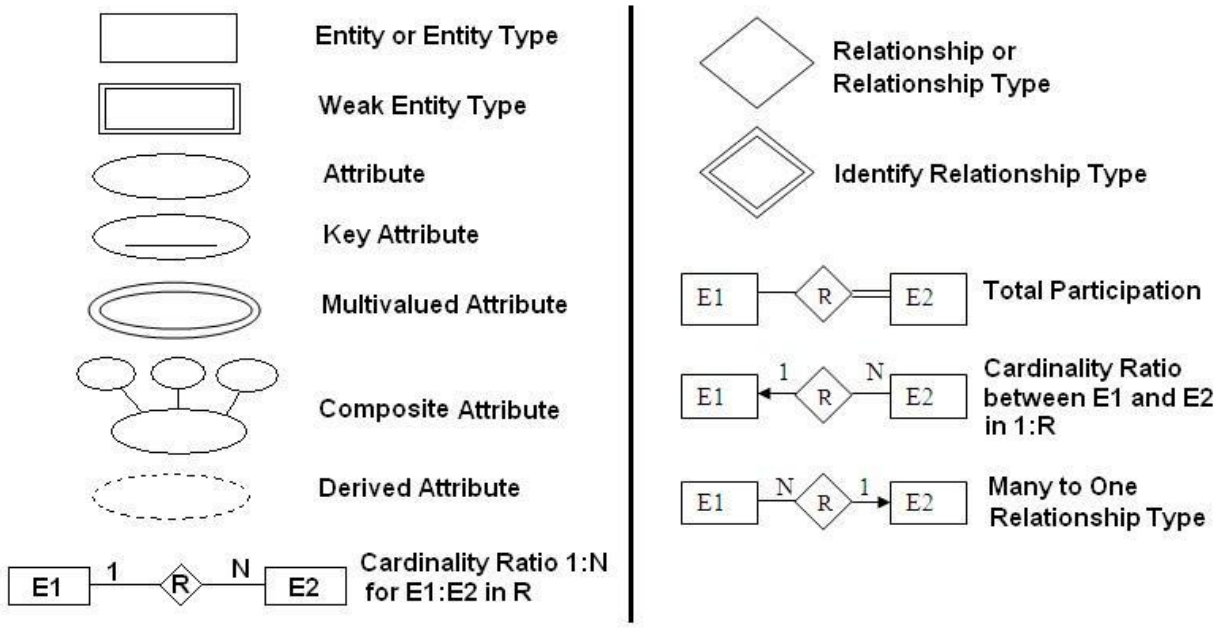
6. **Pre-Experiment Exercise:**
   Brief Theory
   Explain an Entity Relationship (ER) diagram with notations.

   Entities:
   An **entity** is real-world objects that are represented in database. It can be any object,place,person or class.Data are stored about such **entities**. In **dbms** we store data in the form of table containing information about **entity** type like students,teachers,employees etc
   Weak Entity:
   An entity that does not have a key attribute –
   A weak entity must participate in an identifying relationship type with an owner or identifying entity type –
   Entities are identified by the combination of: – A partial key of the weak entity type – The particular entity they are related to in the identifying entity type



E-R Digram with total participation of College entity set in StudyIn relationship Set - This indicates that each college must have atleast one associated Student.

Attributes:
Give brief description of each attribute with example



Explain basic terms used in Extended Entity Relationship (EER).
Namely Generalization, specialization and aggregation with example

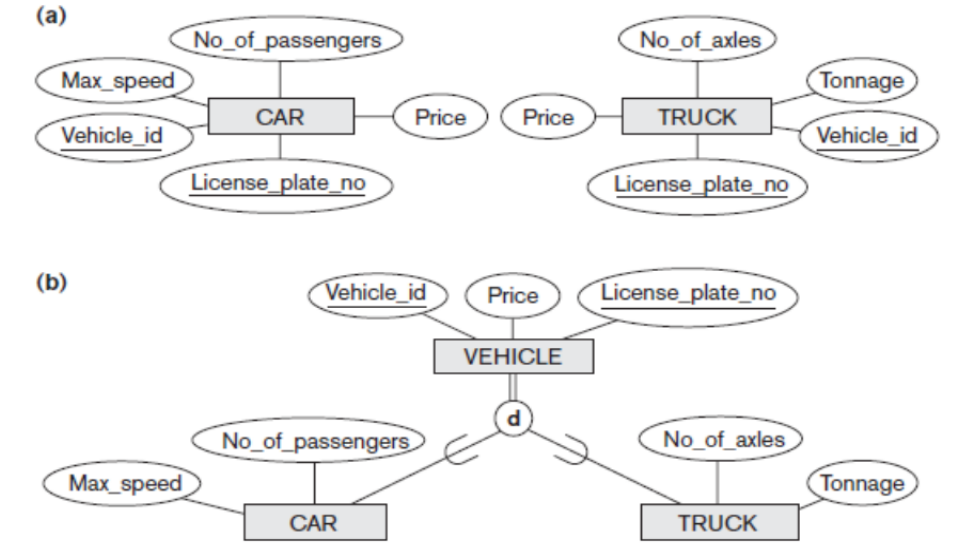


Fig:1 Example of Generalization, Specialization and Aggregation

Explain what a Relational Model is and how to make one.

ER-to-Relational Mapping Algorithm

Step 1: Mapping of Regular Entity Types

Step 2: Mapping of Weak Entity Types

Step 3: Mapping of Binary 1:1 Relation Types

Step 4: Mapping of Binary 1:N Relationship Types.

Step 5: Mapping of Binary M:N Relationship Types.

Step 6: Mapping of Multivalued attributes.

Step 7: Mapping of N-ary Relationship Types.

Mapping EER Model Constructs to Relations

Step 8: Options for Mapping Specialization or Generalization.

Step 9: Mapping of Union Types (Categories).

7. **Laboratory Exercise:**
   A. Procedure:
      i) Draw ER diagram for the chosen system.
      ii) Draw EER diagram for the chosen system.
      iii) Stepwise design a relational model.

   B. Result/Observation/Program code: Attach printouts of above diagram

8. **Post Experimental Exercise-**
   A. Questions:
      1. What are the limitations of an ER diagram?
      2. Compare ER and EER Diagram
      3. What do you mean by Cardinality?

   B. Conclusion:
      1. Design An ER diagram for the Railway reservation system.
      2. Write the Entity sets and Relationships for the above ER diagram
      3. Write the types of attributes that are used in a given ER diagram.

C. References:

[1] Elmasri and Navathe, “Fundamentals of Database Systems”, 5th Edition, PEARSON Education.

[2] Korth, Silberchatz, Sudarshan, “Database System Concepts”, 6th Edition, McGraw – Hill