A.Y. 2023-2024
Class: SE-ITA/B, Semester: III

Subject: **Structured Query Lab**
Experiment – 1: 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

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. What is a problem statement?
   3. What is the need of a database? Etc.

B. **Conclusion:**
   1. Write what was performed in the experiment
   2. Mention few applications of what was studied.
   3. Write the significance of the studied topic

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

Department Of Information Technology

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Experiment – 1B: 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:** LibreOffice/StarUML

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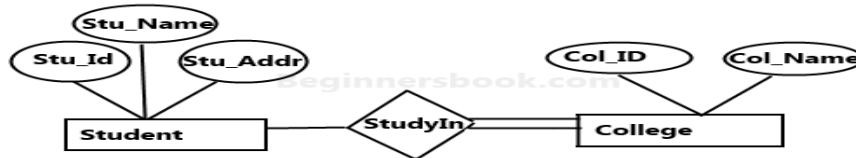   Explain an Entity Relationship (ER) diagram with notations.

   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
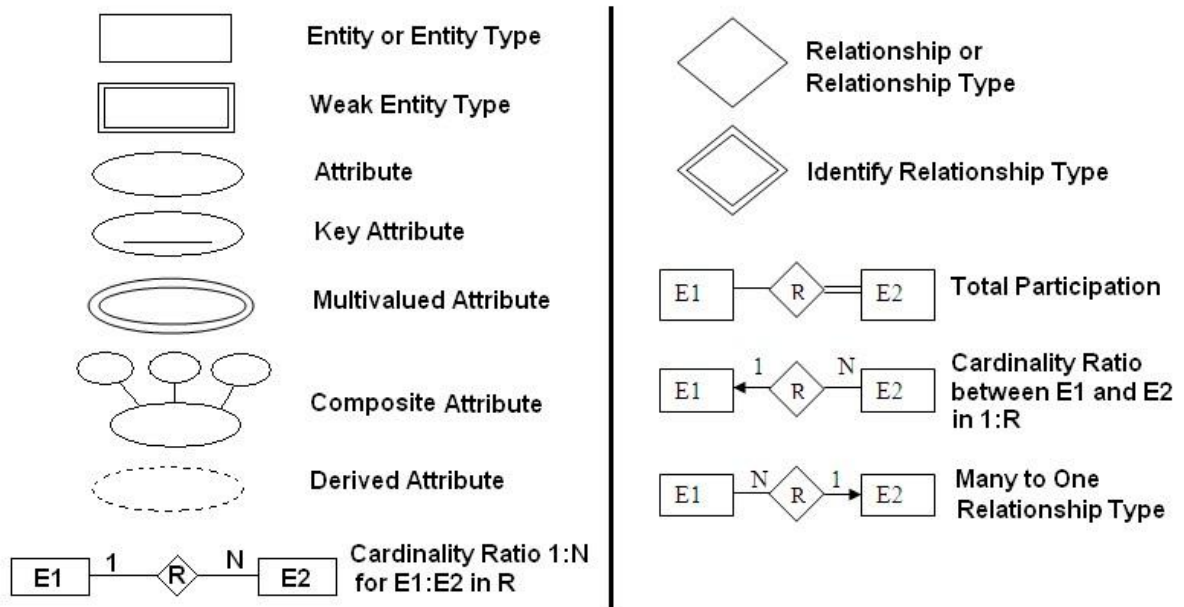
Explain basic terms used in Extended Entity Relationship (EER).
Namely Generalization, specialization and aggregation with example
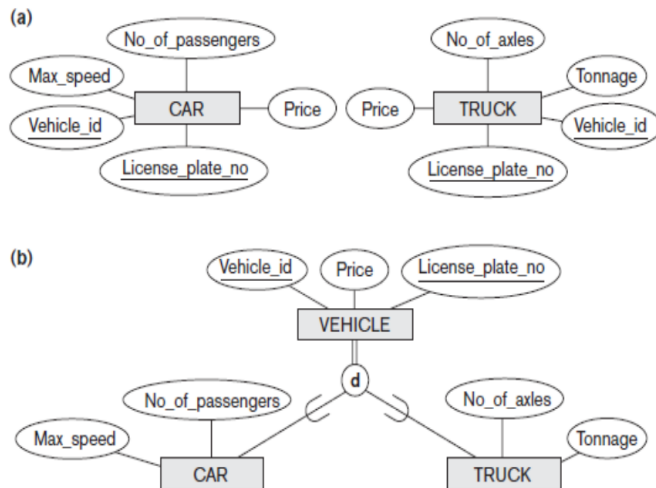
Fig:1 Example of Generalization, Specialization and Aggregation

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) What is ER Diagram.
      ii) Draw ER diagram for the chosen system.
   B. **Result/Observation/Program code: Attach printouts of above diagram**

8. **Post Experimental Exercise-**

A. Questions:

1. What are the limitations of ER diagram?
2. Compare ER and EER Diagram
3. What do you mean by Cardinality? Etc.

B. Conclusion:

1. Write what was performed in the experiment
2. Mention few applications of what was studied.
3. Write the significance of the studied topic

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