SE-computer (Div-B)	Roll number : 8953
Experiment no. : 2	Date of Implementation: 06/04/2021
Related Course outcome : At the end of the course, Students will be able to design EER model and develop relational model	

Rubrics for assessment of Experiment:

Indicator	Poor	Average	Good
Timeliness • Maintains assignment deadline (3)	Assignment not done (0)	One or More than One week late (1-2)	Maintains deadline (3)
Completeness and neatness • Complete all parts of ER diagram(3)	N/A	< 80% complete (1-2)	100% complete (3)
Originality • Extent of plagiarism(2)	Copied it from someone else(0)	At least few questions have been done without copying(1)	Assignment has been solved completely without copying (2)
Knowledge • In depth knowledge of the assignment(2)	Unable to answer 2 questions(0)	Unable to answer 1 question (1)	Able to answer 2 questions (2)

Assessment Marks :

Timeliness	
Completeness and neatness	
Originality	
Knowledge	
Total	

Total : (Out of 10)

Teacher's Sign :

Name Student	Brendan Lucas	**Roll No.**	8953
Lab Experiment No.	2	**Date**	06/04/2021
Expt. Title	Draw EER diagram and Relational Model of Problem		
Tools used	draw.io. or Lucidchart		

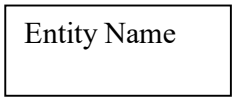
Aim : To extend the ER diagram designed in experiment 1 using enhanced feature of EER and to convert EER diagram in the form of relational model.

Objective of the Experiment:

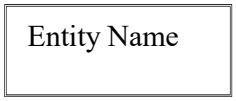
1. Draw EER for problem defined in expt. no1.
2. Convert this EER diagram into relational model

Theory : Summary of ER, EER Diagram Notation

Strong Entities

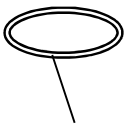


Weak Entities

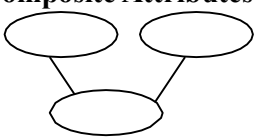


Attributes

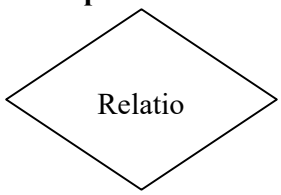
Multi Valued Attributes



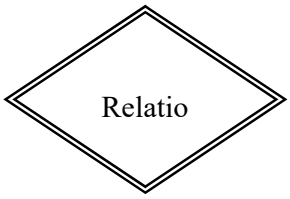
Composite Attributes



Relationships

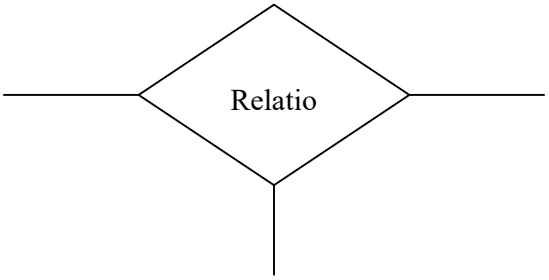


Identifying Relationships



N-ary relationships

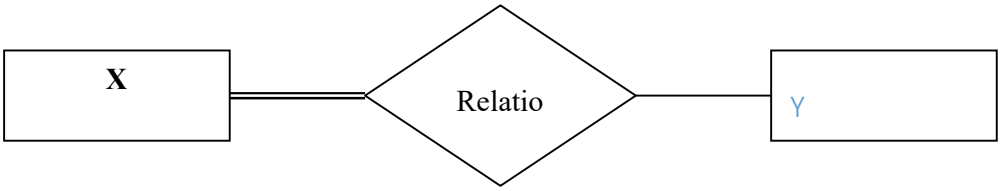
- **More than 2 participating entities.**



Constraints - Participation

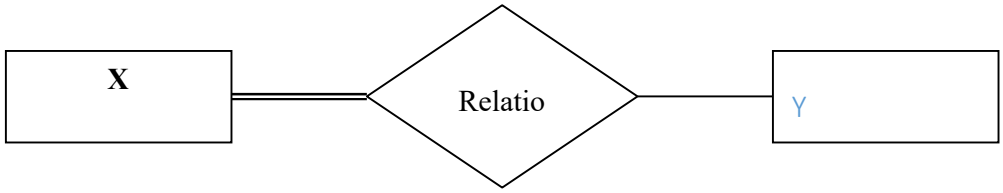
- **Total Participation - entity X has total participation in Relationship Z, meaning that every instance of X takes part in AT LEAST one relationship. (i.e. there are no members of X that do not participate in the relationship.**

***Example*: X is Customer, Y is Product, and Z is a 'Purchases' relationship. The figure below indicates the requirement that every customer purchases a product.**



- **Partial Participation - entity Y has partial participation in Relationship Z, meaning that only some instances of Y take part in the relationship.**

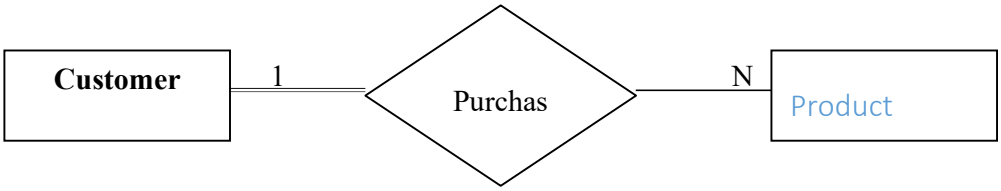
***Example*: X is Customer, Y is Product, and Z is a 'Purchases' relationship. The figure below indicates the requirement that not every product is purchases by a customer.**



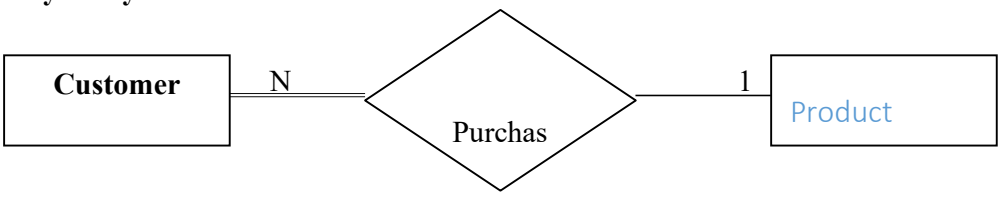
Some products may not be purchased at all.

Constraints - Cardinality

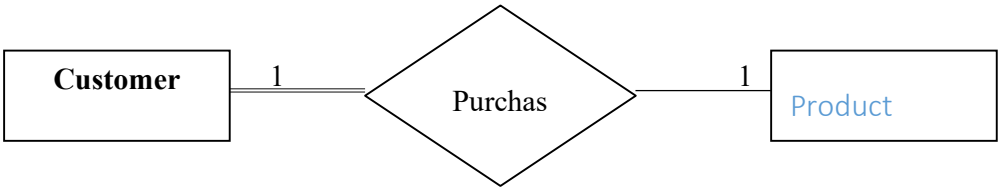
- **1:N – One Customer buys many products, each product is purchased by only one customer.**



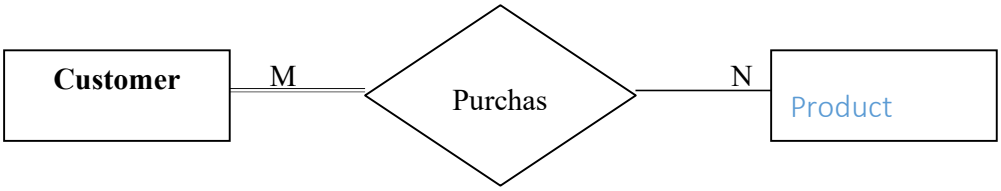
- **N:1 - Each customer buys at most one product, each product can be purchased by many customers.**



- **1:1 – Each customer purchases at most one product, each product is purchased by only one customer.**

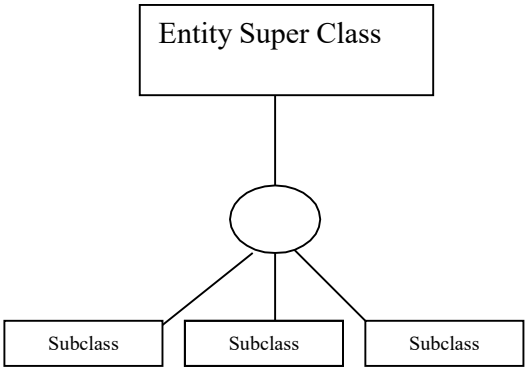


- **M:N – Each customer purchases many products, each product is purchased by many customers.**



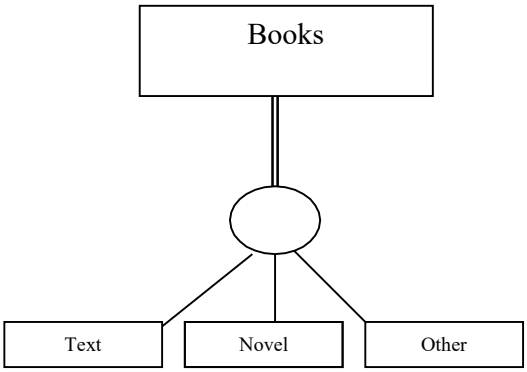
Specialization/Generalization

- **Each subclass inherits all relationships and attributes from the super-class.**

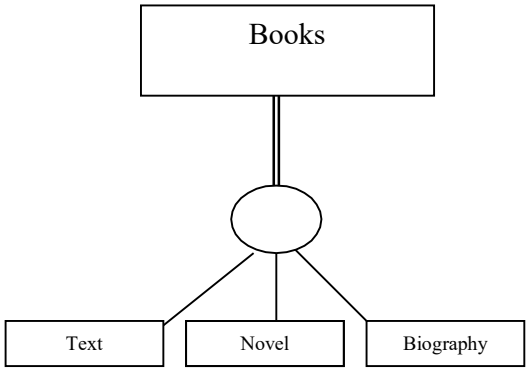


Constraints on Specialization/Generalization

- **Total Specialization – Every member of the super-class must belong to at least one subclass. For example, any book that is not a text book, or a novel can fit into the "Other" category.**

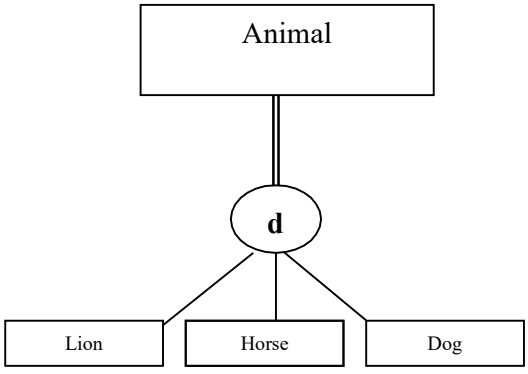


- **Partial Specialization – each member of the super-class may not belong to one of the subclasses. For example, a book on poetry may be neither a text book, a novel or a biography.**

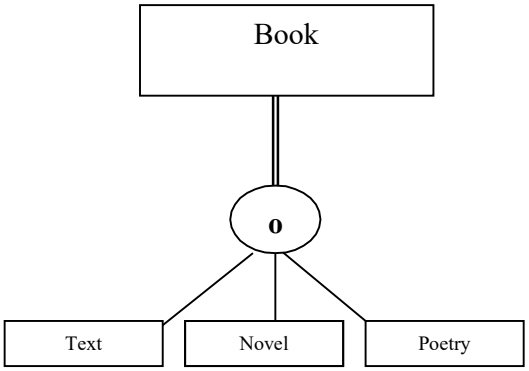


Disjointness Constraint

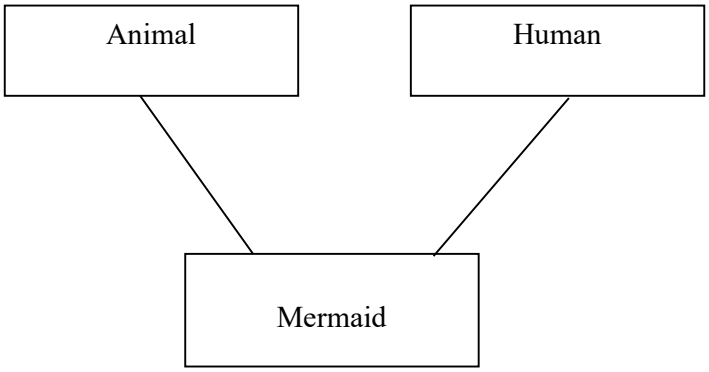
- **Disjoint – every member of the super-class can belong to at most one of the subclasses. For example, an Animal cannot be a lion and a horse, it must be either a lion, a horse, or a dog.**



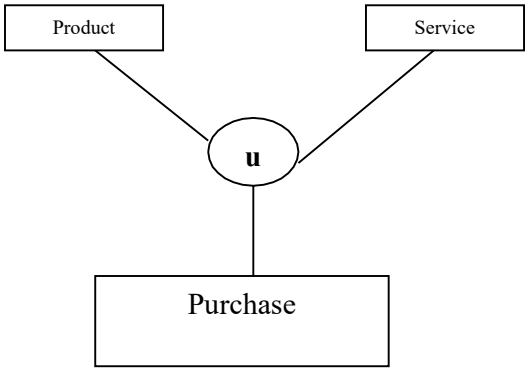
Overlapping – every member of the super-class can belong to more than one of the subclasses. For example, a book can be a text book, but also a poetry book at the same time.



Multiple Inheritance – a subclass participates in more than one subclass/super-class relationship, and inherits attributes and relationships from more than one super-class. For example, the subclass Mermaid participates in two subclass/super-class relationships, it inherits attributes and relationships of Animals, as well as attributes and relationships of Humans.



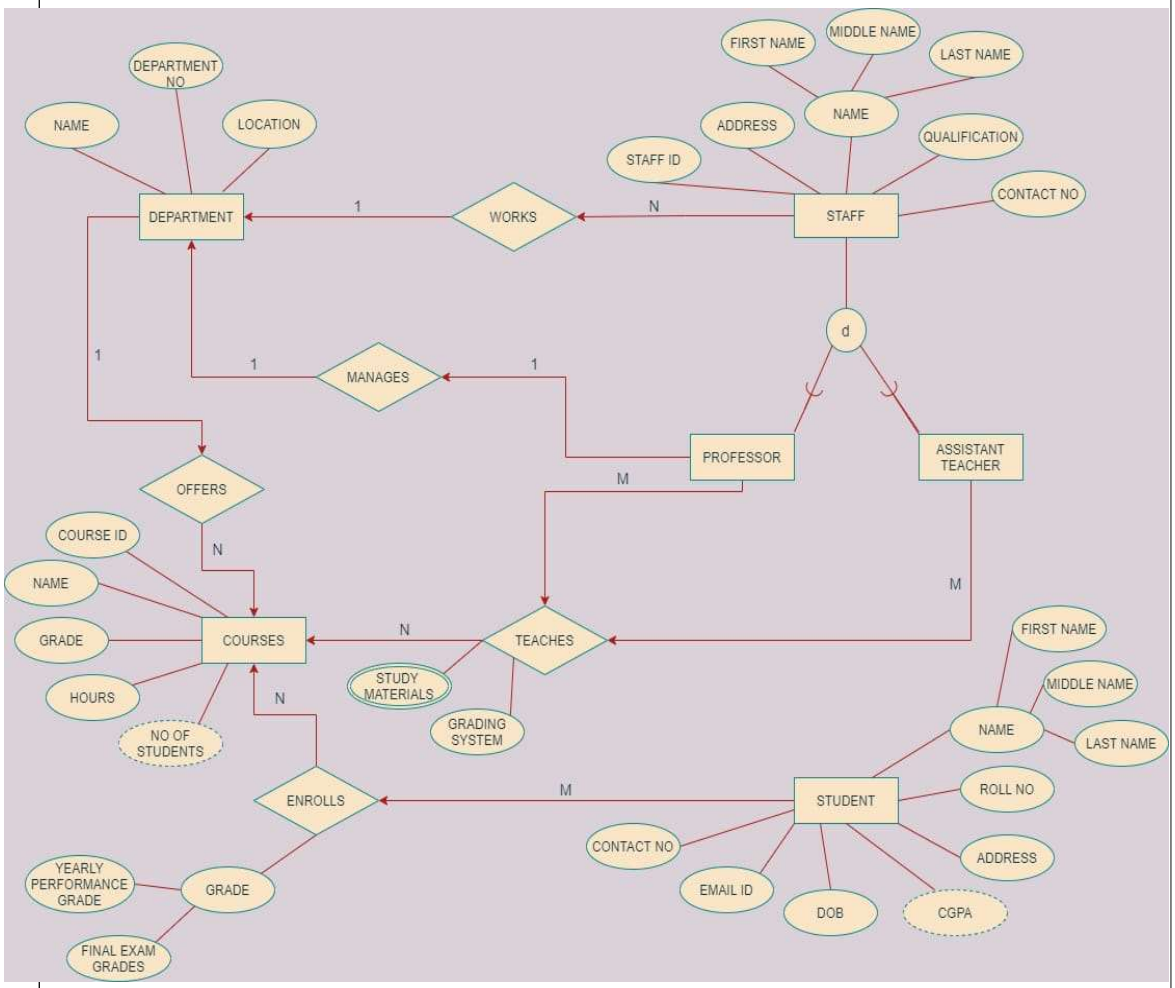
Union – a subclass/super-class relationship can have more than one super-class, and the subclass inherits from at most one of the super-classes (i.e. the subclass purchase will inherit the relationships and attributes associated with either service or product, but not both). Each super class may have different primary keys, or the same primary key. All members of the super-classes are not members of the super-class. For example, a purchase can be a product, or a service, but not both. And all products and services are not purchases.



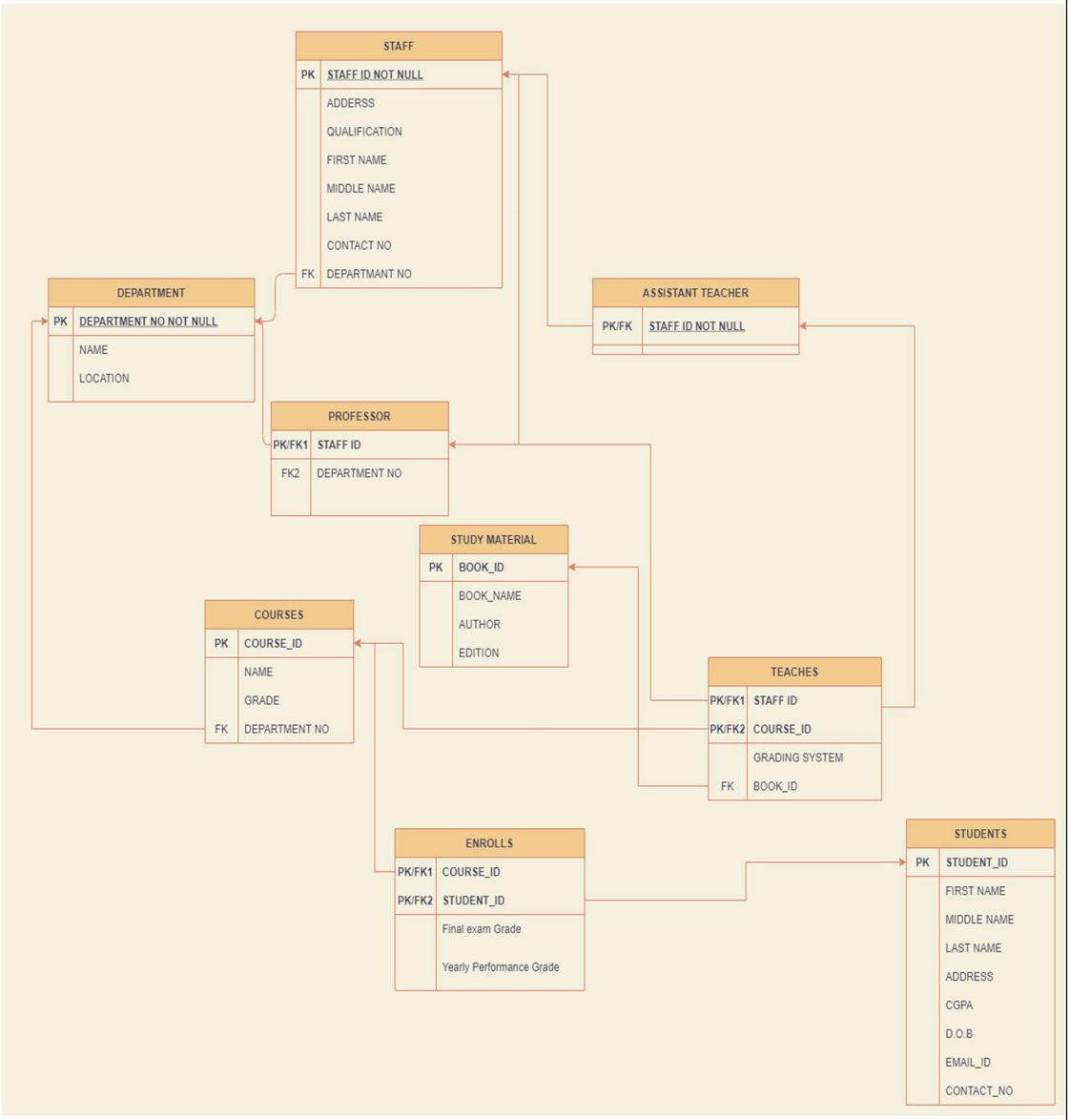
Description of Problem Statement (From Experiment 1):-

- The topic for our group was college information management system.
- The Diagram contains 6 entities and 5 relations between those entities. Each of these can have multiple attributes.
- The 6 entities followed by their attributes
  - STAFF:
    - Name
    - Address
    - Qualification
    - Contact_no
    - Staff_id
    - Staff Can be any one of the following
      - PROFESSOR
      - ASSISTANT TEACHER
  - DEPARTMENT:
    - Dept_name
    - Dept_no
    - Location
  - COURSES:
    - Name
    - No_of_students
    - Course_id
    - Grade
    - No_of_hours
  - STUDENT:
    - Name
    - Roll_no
    - Address
    - CGPA
    - DOB
    - Email-id
    - Contact_no
- The 5 relations are as follows:
  - Works for:
    - Contains 1 Department
    - Contains N Staff
  - Manages
    - Contains 1 Department
    - Contains 1 Professor
  - Offers
    - Contains 1 Department
    - Contains N Courses
  - Teaches
    - Contains M Teachers and Professors
    - Contains N Courses
    - Has the following attributes
      - Study Material
      - Grading System
  - Enrolls
    - Contains N Courses
    - Contains M Students
    - Has the following attributes
      - Grade

EE-R diagram for the Problem to be implemented.



Relational Model of Problem (Mapping of EER to Relational model)



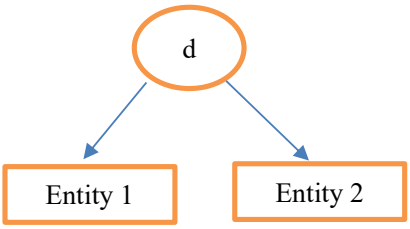
Post Lab Assignment:

1) Describe various symbols used in EE-R Diagram

Ans.

Multi Valued Attribute: If an attribute can have more than one value it is called a multi-valued attribute.

Disjoint: every member of the super-class can belong to at most one of the subclasses.



Strong entity is one that exists on its own, independent of other entities.

Weak entity is one whose existence depends on another entity. A weak entity cannot be uniquely identified by its attributes alone.

Strong relationships are connections that exist between a strong entity type and its owner.

Weak relationships are connections that exist between a weak entity type and its owner.