SE-computer (Div-B)	Roll number : **8942**
Experiment no. : 2	Date of Implementation : **16/04/2021**
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	GINI CHACKO	**Roll No.**	8942
Lab Experiment No.	2	**Date**	16/04/2021
Expt. Title	Draw EER diagram and Relational Model of Problem		
Tools used	draw.io. or Lucidchart		

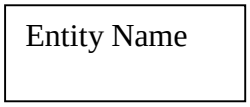
Aim : To extend the ER diagram designed in experiment 1 using enhanced feature of EER and to convert EER diagram in the form of relational model.

Objective of the Experiment:

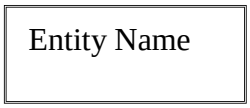
1. Draw EER for problem defined in expt. no1.
2. Convert this EER diagram into relational model

Theory : Summary of ER, EER Diagram Notation

Strong Entities

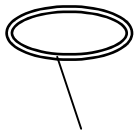


Weak Entities

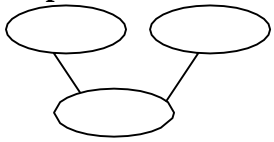


Attributes

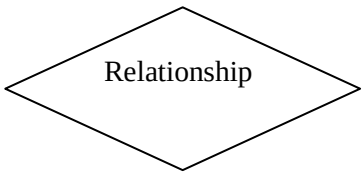
Multi Valued Attributes



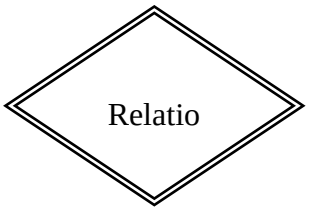
Composite Attributes



Relationship

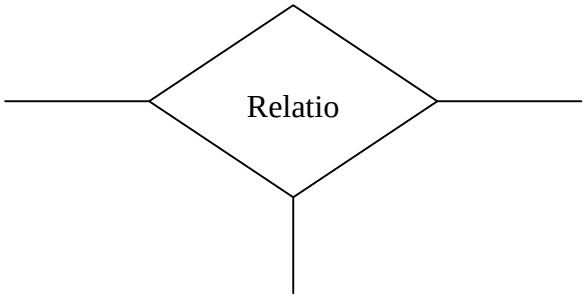


Identifying Relationships



N-ary relationships

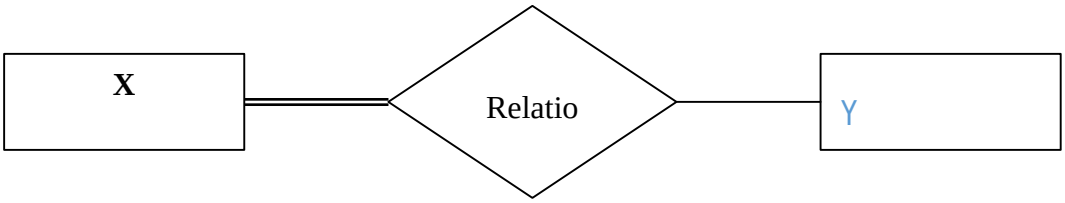
- **More than 2 participating entities.**



Constraints - Participation

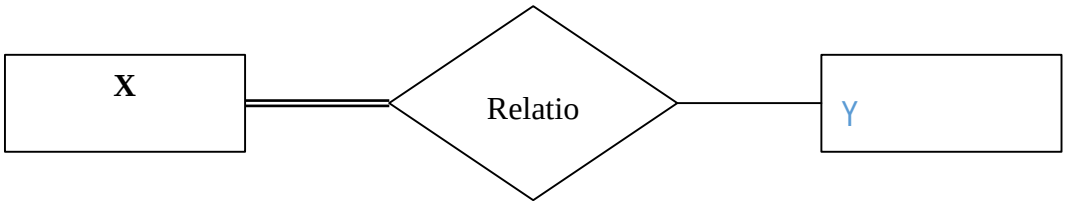
- **Total Participation - entity X has total participation in Relationship Z, meaning that every instance of X takes part in AT LEAST one relationship. (i.e. there are no members of X that do not participate in the relationship.**

***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.**

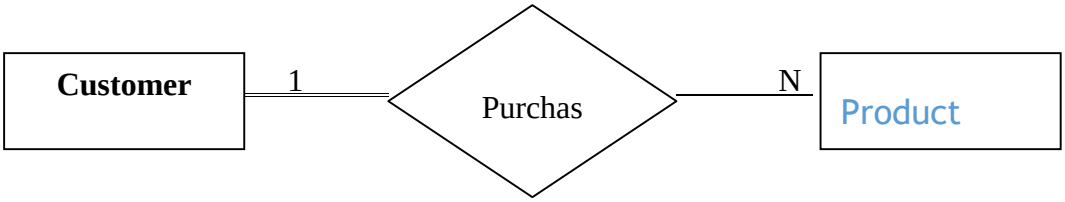
***Example*: X is Customer, Y is Product, and Z is a 'Purchases' relationship. The figure below indicates the requirement that not every product is purchases by a customer.**



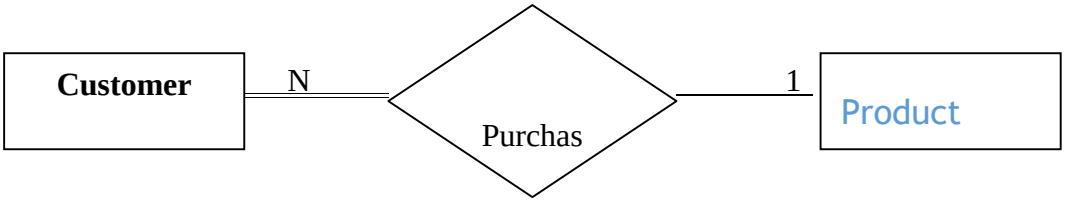
Some products may not be purchased at all.

Constraints - Cardinality

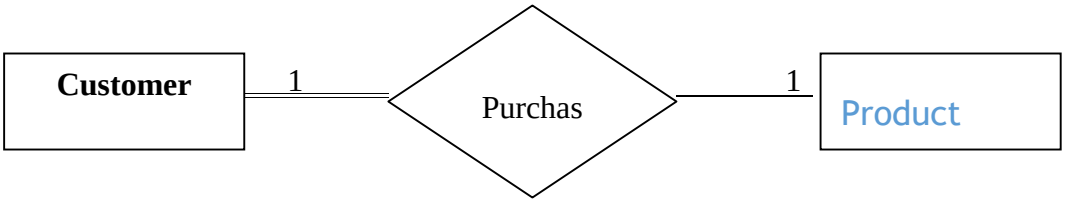
- **1:N – One Customer buys many products, each product is purchased by only one customer.**



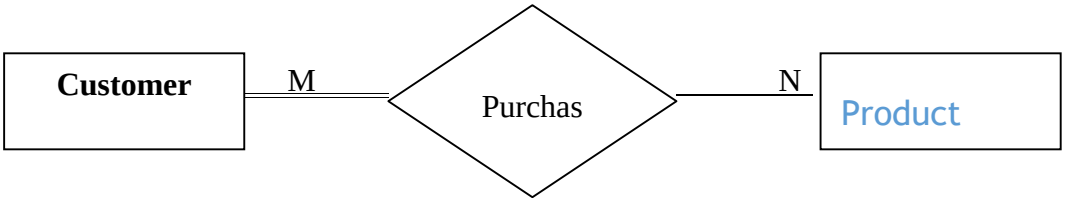
- **N:1 - Each customer buys at most one product, each product can be purchased by many customers.**



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

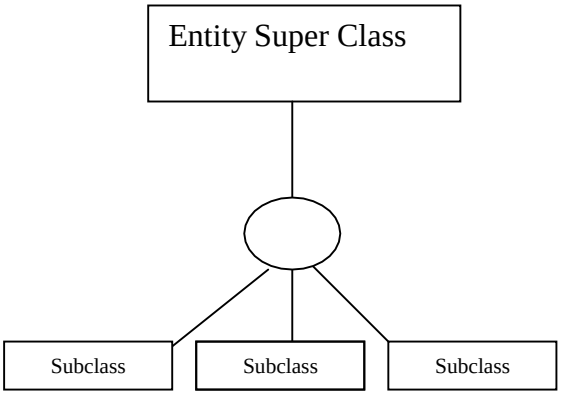


- **M:N – Each customer purchases many products, each product is purchased by many customers.**



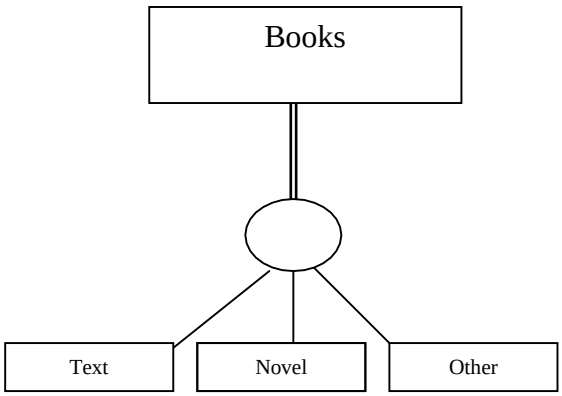
Specialization/Generalization

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

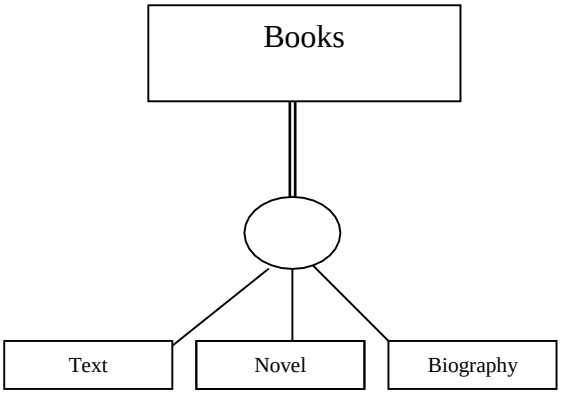


Constraints on Specialization/Generalization

- **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.**

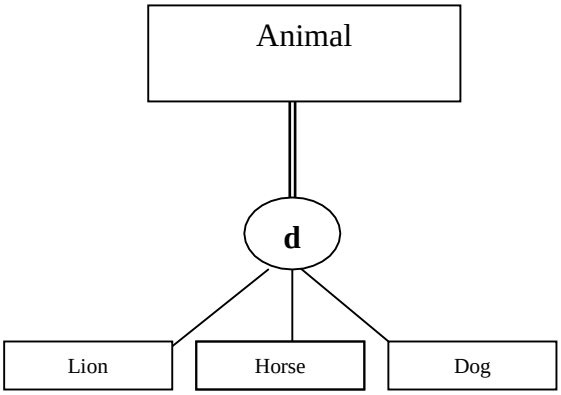


- **Partial Specialization – each member of the super-class may not belong to one of the subclasses. For example, a book on poetry may be neither a text book, a novel or a biography.**

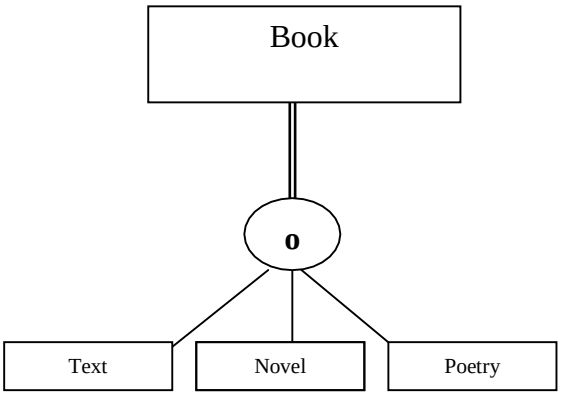


Disjointness Constraint

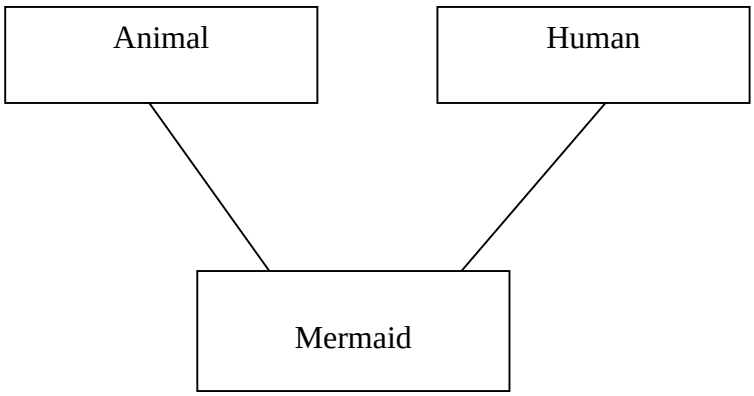
- **Disjoint – every member of the super-class can belong to at most one of the subclasses. For example, an Animal cannot be a lion and a horse, it must be either a lion, a horse, or a dog.**



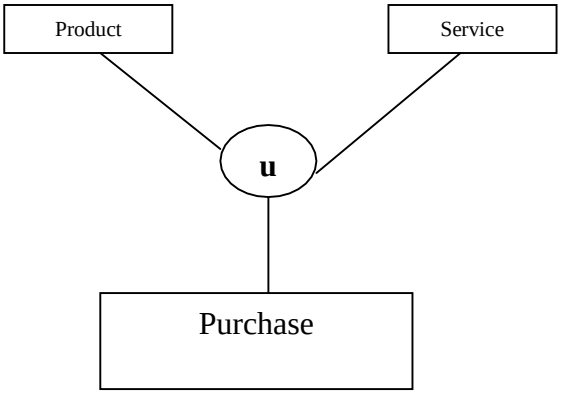
Overlapping – every member of the super-class can belong to more than one of the subclasses. For example, a book can be a text book, but also a poetry book at the same time.



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.**



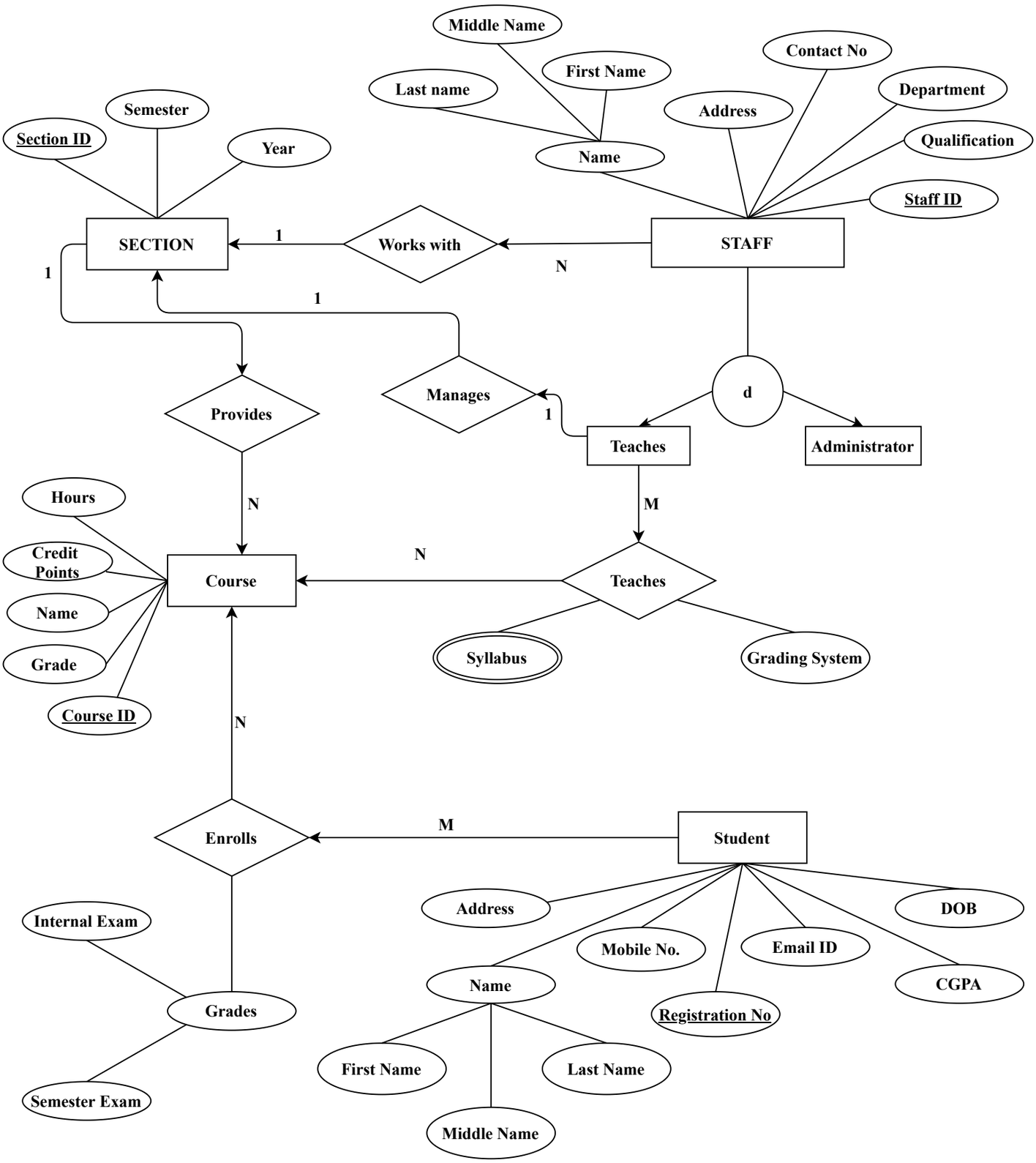
Union – a subclass/super-class relationship can have more than one super-class, and the subclass inherits from at most one of the super-classes (i.e. the subclass purchase will inherit the relationships and attributes associated with either service or product, but not both). Each super class may have 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.



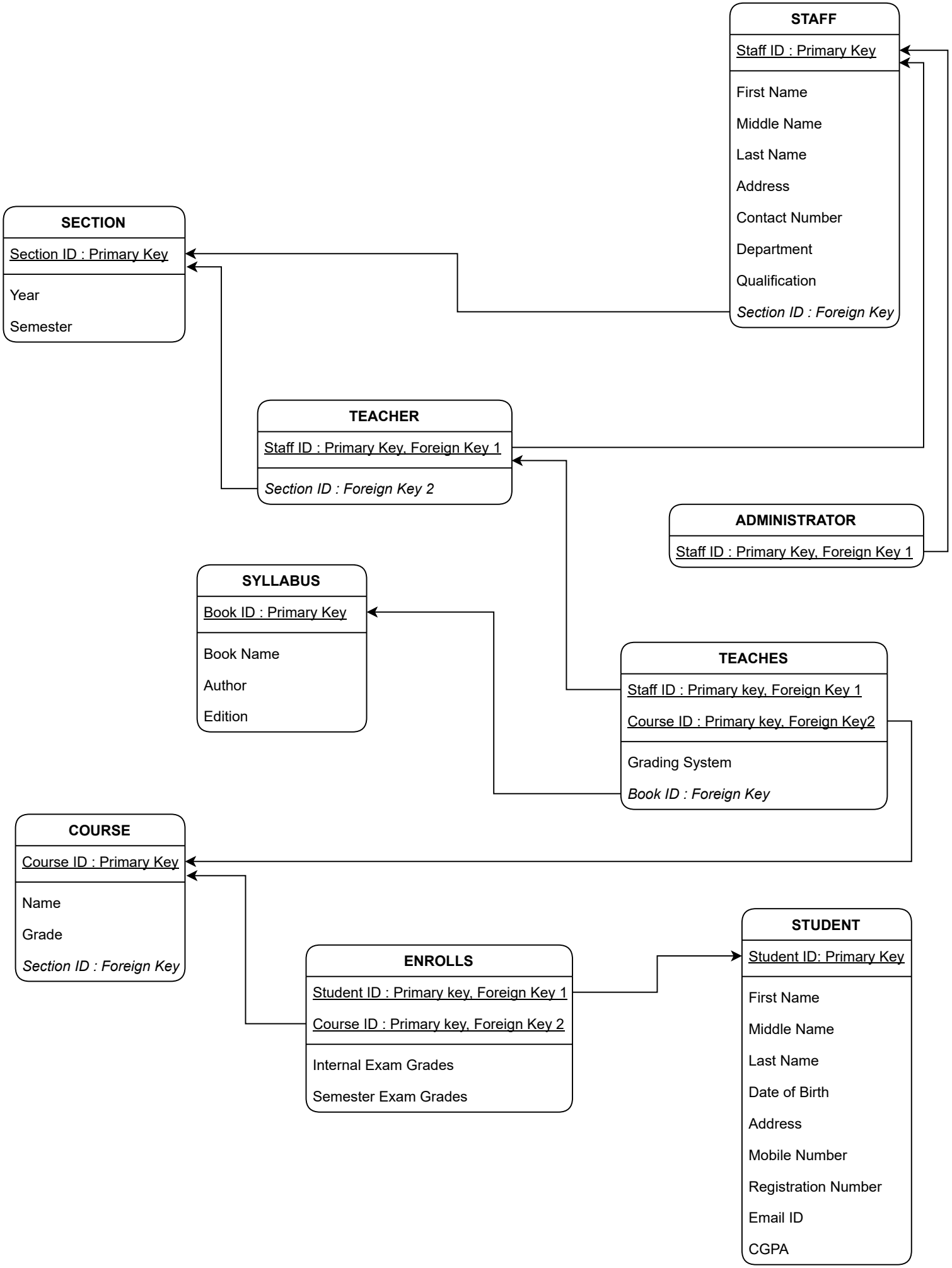
Description of Problem Statement (From Experiment 1):-

Description of Problem Statement:
Topic: COLLEGE INFORMATION MANAGEMENT SYSTEM

- A College contains many sections.
- Each Section can offer any number of Courses.
- Many Staff can work in a Section.
- A Staff can be a Lecturer or Administrator but not both.
- A Lecturer can work only in one Section. For each section there is a Head.
- A Lecturer can be head of only one Section.
- Each Lecturer can take any number of Courses.
- A Course can be taken by any number of Lecturer.
- A Student can enroll for any number of Courses.
- Each course can have any number of Students.



EXTENDED ER DIAGRAM - COLLEGE INFORMATION MANAGEMENT SYSTEM



RELATIONAL MODEL – COLLEGE INFORMATION MANAGEMENT SYSTEM

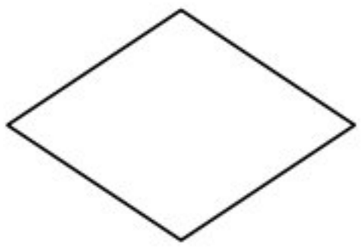
POSTLAB QUESTION:

1. Describe the various symbols used in the ER diagram.

Ans:

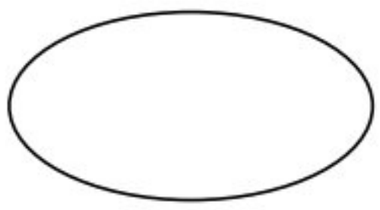
ENTITY

An entity can be a person, place,event, or object
that is relevant to a given system. Entities are represented in ER diagrams by a rectangle and named using singular nouns.



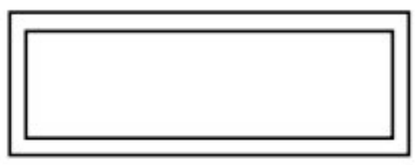
RELATIONSHIP

A relationship is defined as a bond or attachment
between two or more entities. Normally, a verb in a sentence signifies a relationship.



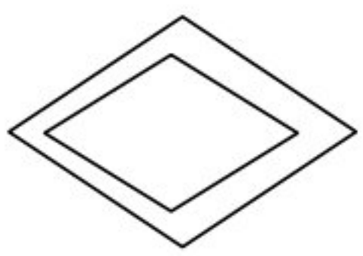
ATTRIBUTE

Each entity has a set of properties.
These properties of each entity are termed as attributes. Attributes are indicated by ovals in an e-r diagram.



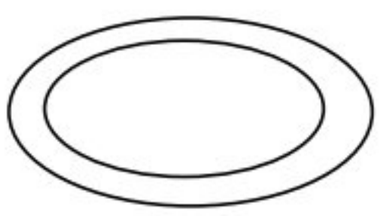
WEAK ENTITY

A weak entity does not have a primary key attribute and depends on other entity via a foreign key attribute.



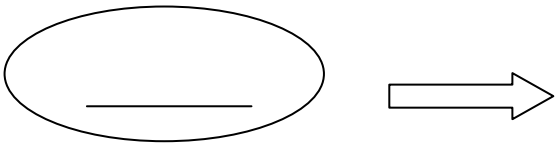
WEAK ENTITY RELATIONSHIP

The relation between one strong and one weak entity is represented by double diamond.



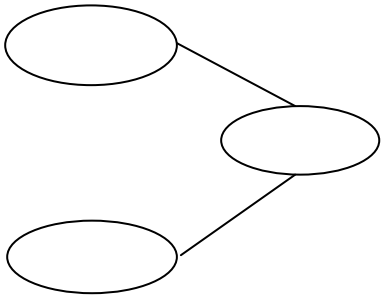
MULTIVALUED ATTRIBUTE

An attribute which can hold more than one value, it is then termed as multi-valued attribute.



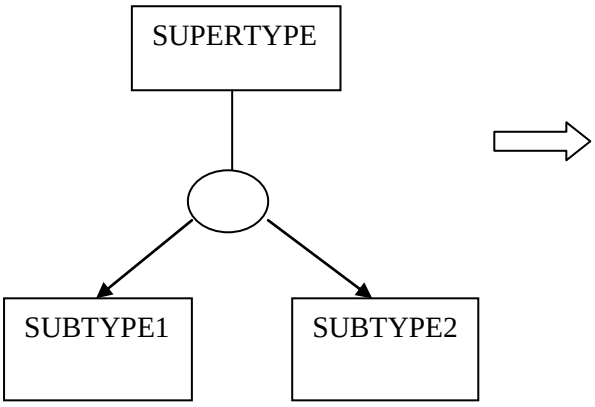
KEY ATTRIBUTE

A key attribute is the unique characteristic of the entity. For eg, Course_ID is the key attribute of the entity Employee



COMPOSITE ATTRIBUTE

A composite attribute can be subdivided into smaller components which further form attributes. For example, 'name' attribute of an entity "person" can be broken down into first name and last name which further form attributes



SUPERTYE AND SUBTYPE

Relationships at the super type lever indicate that all Subtypes will participate in the relationship. The instances of a subtype may participate in a relationship unique to that subtype

IS-A

DISJOINT

NON-DISJOINT OVERLAPPING

CATEGORY CLASS UNION