

K. I .E. T.

WELCOME TO COURSE MANUAL



DBMS LAB FILE

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Year : 2

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Print

INTRODUCTION TO DBMS

UNIT 1

Chapter -1

INTRODUCTION

1.1 An Overview of database Management System:

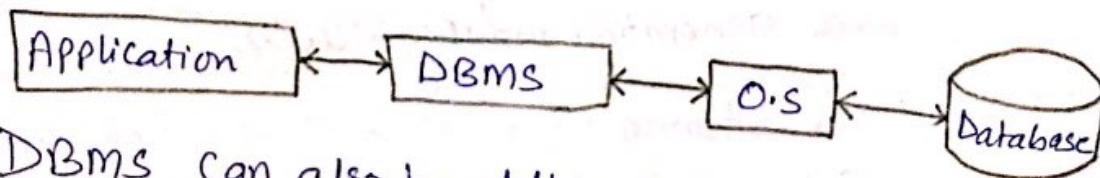
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Database is the combination of two words

Database + Management System = DBMS

A Database is a collection of related information stored, so that it is available to many users for different purposes.

On the other hand Management system is a collection of programs that enables users to create and maintain the database.



DBMS can also be defined as an interface between the application program and the operating system to access or manipulate that database.

A DBMS is a software system that allows access to data contained in the database. Its objective is to provide a convenient and effective method of defining, storing and retrieving the information contained in the database. The DBMS interfaces with application programs so that the data contained in the database can be used by multiple applications & users.

1.2 Applications of DBMS

Some of the important application fields of DBMS are:

1. Banking: for maintaining customer information, accounts, loans and banking transactions.
2. Universities: for maintaining student records, course registration and grades.
3. Railway Reservation: for checking the availability of reservation in different trains, tickets, etc.
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Advantages & Disadvantages of DBMS.

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3. Reduced Application development time: Clearly, the DBMS supports many important functions that are common to many applications accessing data stored in the DBMS.
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Easy Data Administration: When several users share the data, centralizing the administration of data can offer significant improvements.
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3. Cost of Hardware: It incurred in the application of DBMS is its major disadvantage. Cost of the hardware is also one of the major drawback.
4. Complexity of backup and recovery: DBMS provides the centralization of the data, which ~~gives~~ requires the adequate backups of the data so that in case of failure, the data can be recovered. Hence backup problem is also the drawback.

1.5 Database System Versus File systems

Database systems are designed to manage large bodies of information. Management of data involves both defining structures for storage of information and providing mechanisms for the manipulation of information.

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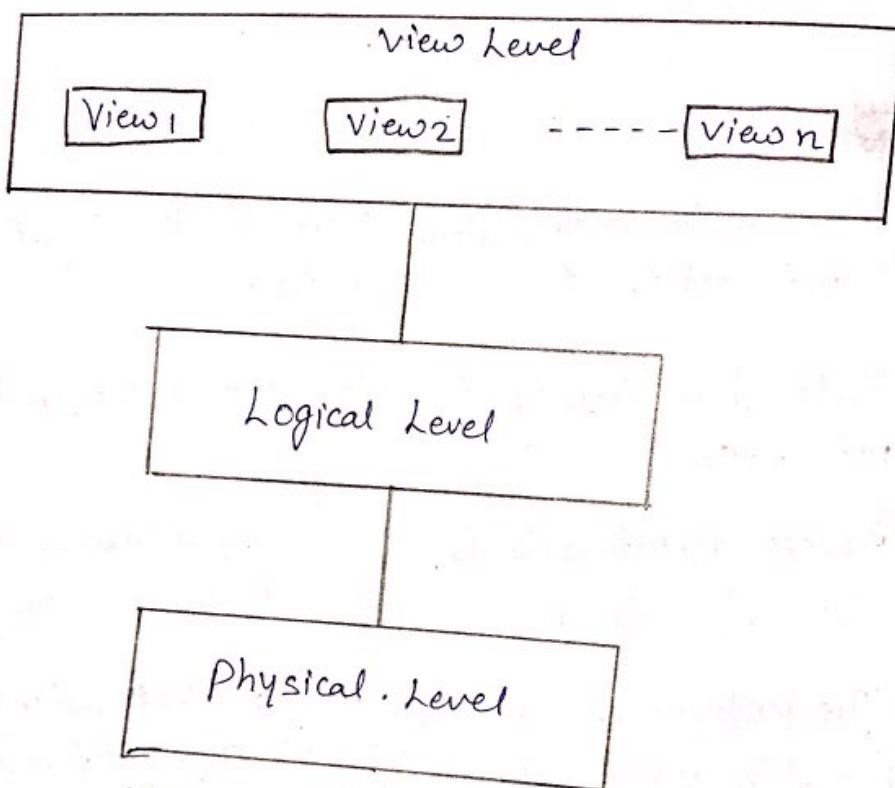
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1.6 Database System Concepts and Architecture

Data Abstraction:



The three levels of data abstraction.

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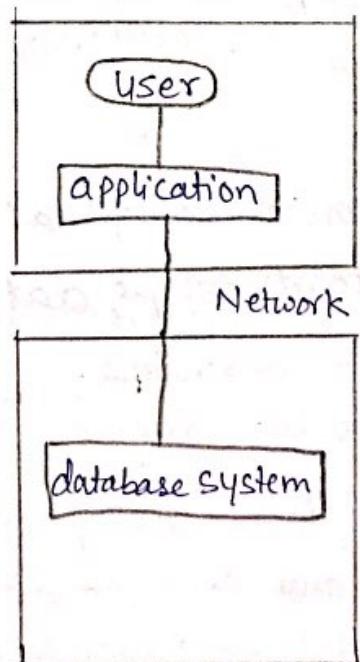
logical level thus describes the entire database in terms of a small number of relatively simple structures.

3. View Level: This is the highest level of abstraction describes only part of the entire database. Even though the logical level uses simpler structures, complexity remains because of the variety of information stored in a large database. The view level of abstraction exists to simplify their interaction with the system. The system may provide many views for the same database.

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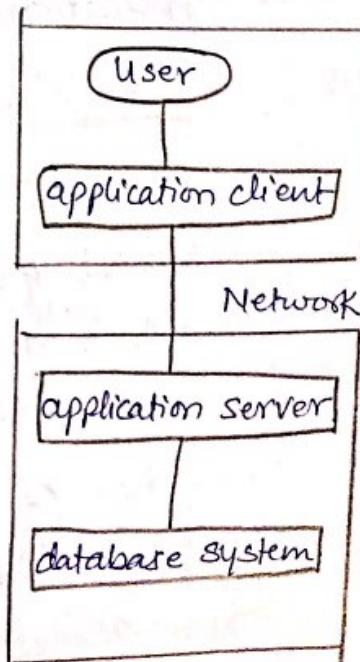
- ① Two-tier architecture.
- ② Three-tier architecture.



2-tier architecture.

Client

Server



3-tier architecture

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Data Model is a collection of conceptual tools for describing data, data relationships, data Semantics, and consistency constraints.

A Data Model can also be define as the

Collection of high-level data description constructs that hide many low-level

Storage details. A data model provides a way to describe the design of a database at the physical, logical & view levels.

1.8.

There are five types of data Models:

1. Relational data Model. (New - 2) ER-model
2. Object-oriented Data Model. (New - 4) (New - 3)
3. Network Data Model. (New 1)
4. Hierarchical Data Model. (Oldest)
5. Object Relational Data Model. (New - 5)

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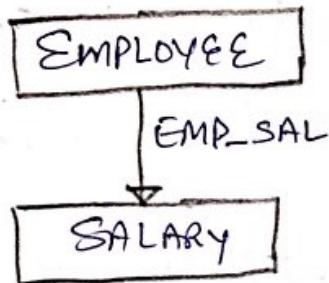
The Relational Model uses a collection of tables to represent both data and the relationship among those data. Each table has multiple columns, and each column has a unique name. This model uses the certain mathematical operations from relational Algebra and relational calculus on the relation, such as Projection, Union and joins etc.

ROLL NO.	NAME	CLASS	ADDRESS	CONTACT NO.
1001	RAM	3rd Year	Noida	094261846

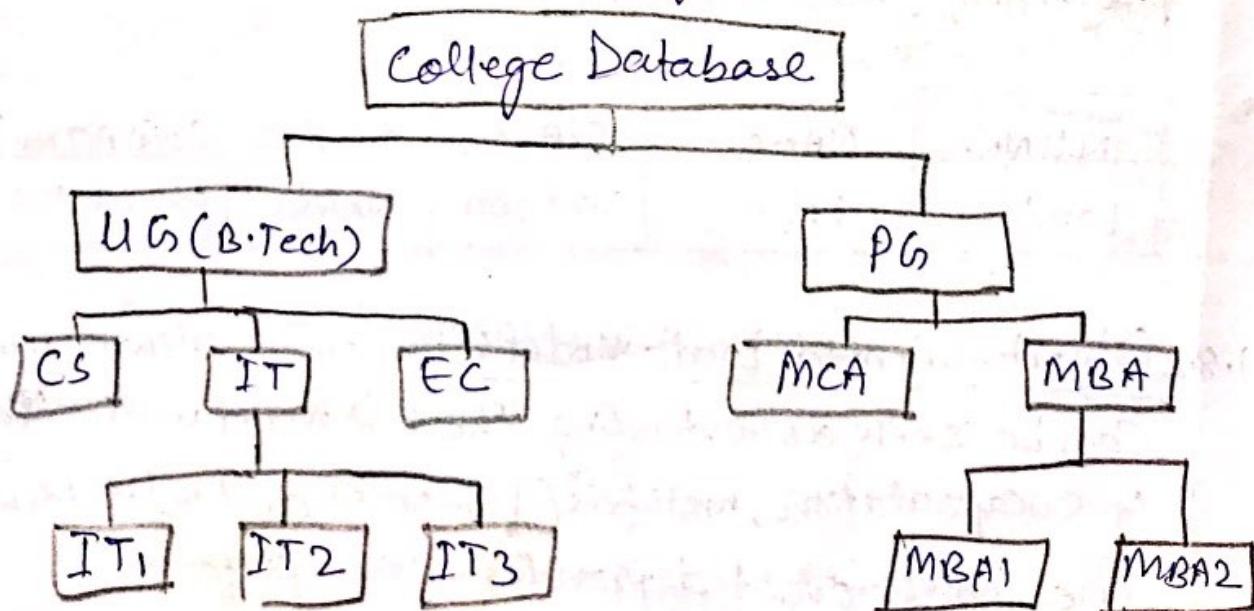
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The object-oriented model can be seen as extending the E-R model with notions of encapsulation, methods (functions), and object identity. The object-oriented provides higher performance management of objects, and it enables better management of the inter-relationships between objects.

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E-R Model: Entity relationship Model.

Chapter - 2

Data Modeling using the ER Model.

2.1 ER Model Concepts

The Entity-relationship (E-R) model is a high-level data model. It is based on a perception of a real world that consists of a collection of basic objects, called entities, and of relationships among these objects. It was developed to facilitate database design by allowing specification of an enterprise schema, which represent the overall logical structure of a database.

An entity: is a "thing" or "object" in the real world that is distinguishable from all other objects.

OR
Anything about which we store information is called an Entity.

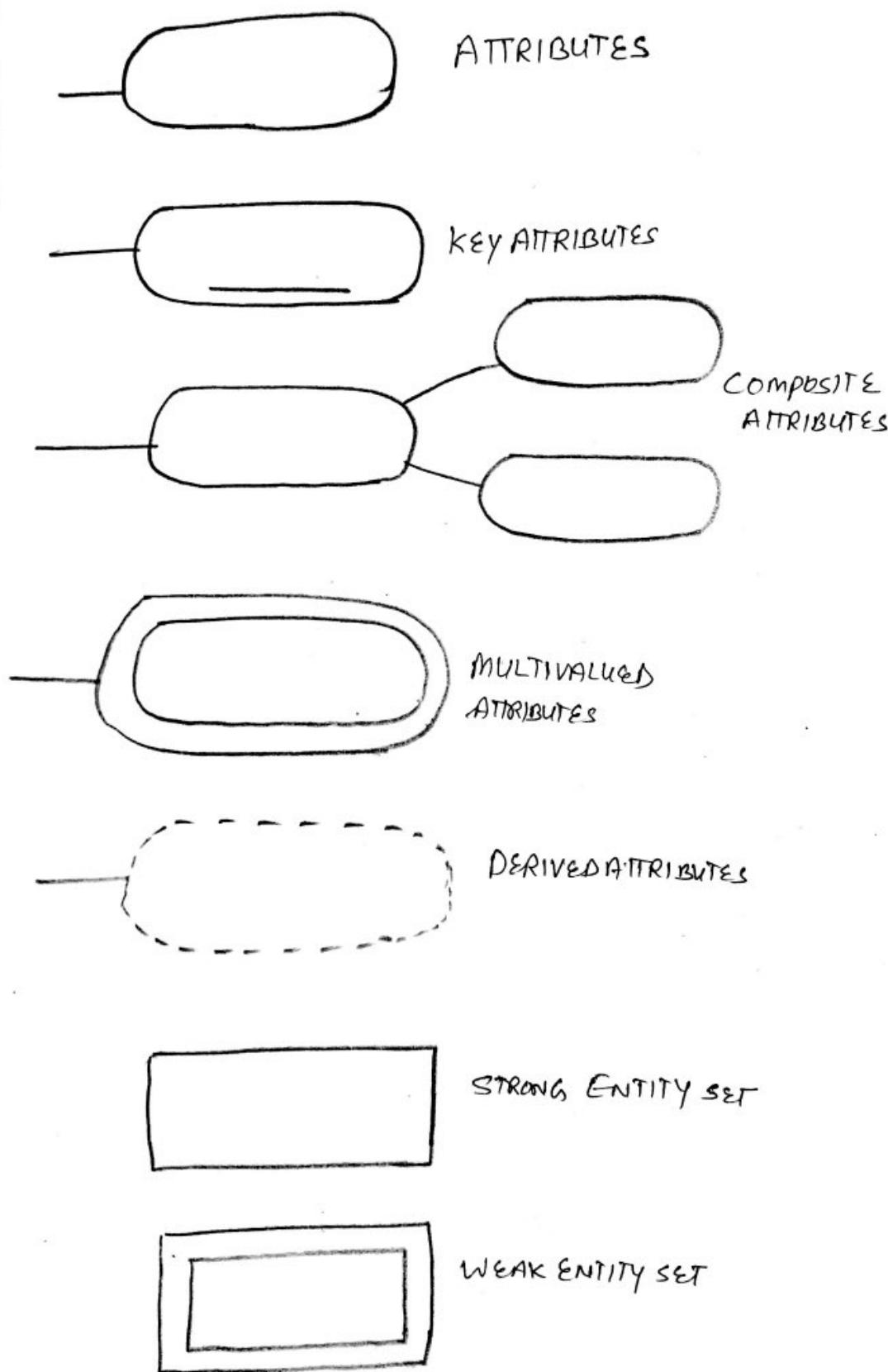
An entity set: is a set of entities of the same type that share the same properties, or attributes.

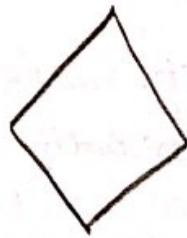
The set of all persons who are customers at a given bank, for eg; can be defined as the entity set customer.

Attributes: An entity is represented by a set of attributes. Attributes are descriptive properties possessed by each member of an entity set.

Attributes describe the entity to which they are associated.

2.2 Notation for E-R Diagram





RELATIONSHIP

LINKS

Single-valued and multivalued attributes: The attributes in our examples all have a single value for a particular entity: for instances, the loan-number attribute for a specific loan entity refers to only one loan numbers. Such attributes are said to be "single valued". An employee may have zero, one, or several phone numbers, and different employees may have different numbers of phones. This type of attribute is said to be "multivalued".

Simple and Composite attributes: Simple attributes are those, which are not divided into subparts. whereas composite attributes, are those which can be divided into subparts. Composite attributes help us to group together related attributes.

✓ Derived Attributes: The value for this type of attribute can be derived from the values of other related attributes or entities.

An attribute takes a null value when an entity does not have a value for it. The null value may indicate "not applicable".

2.3 Mapping Constraints

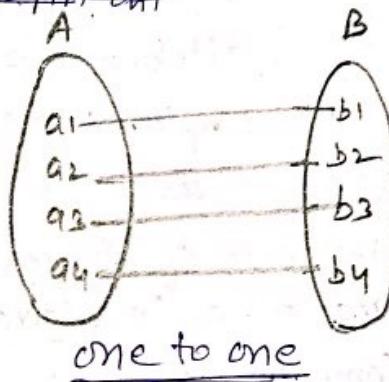
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Mapping cardinalities are most useful in describing binary relationship sets.

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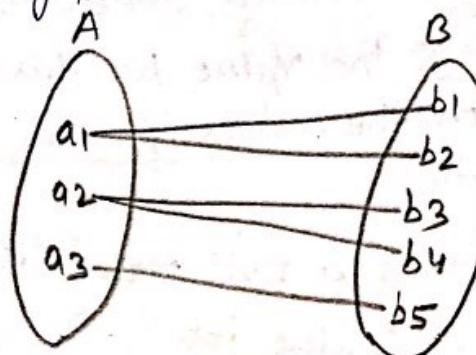
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2. One to many: An ent



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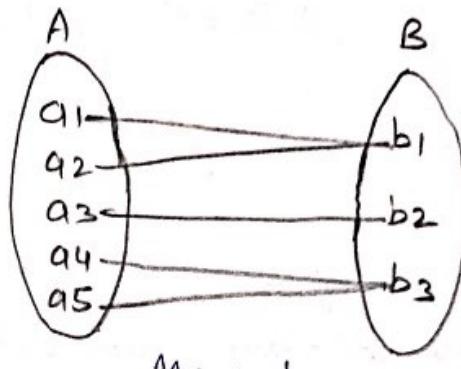


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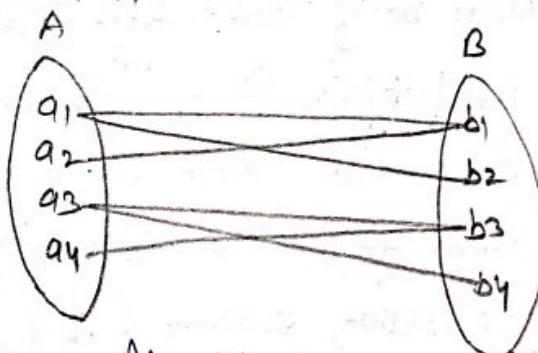
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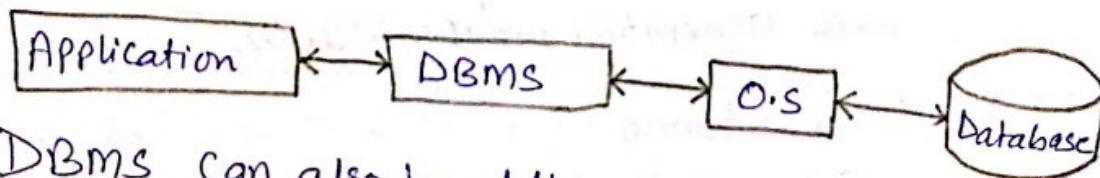
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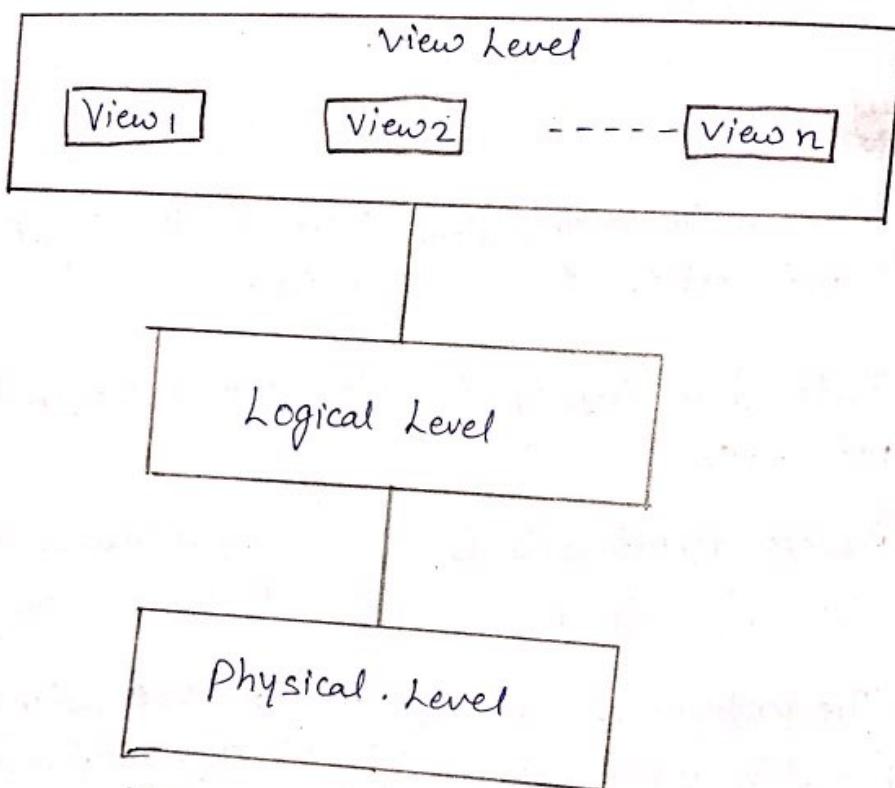
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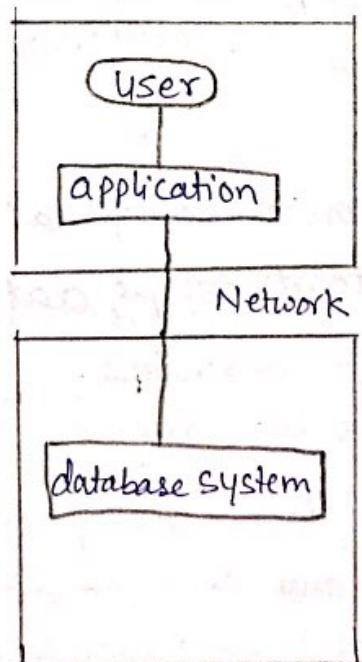
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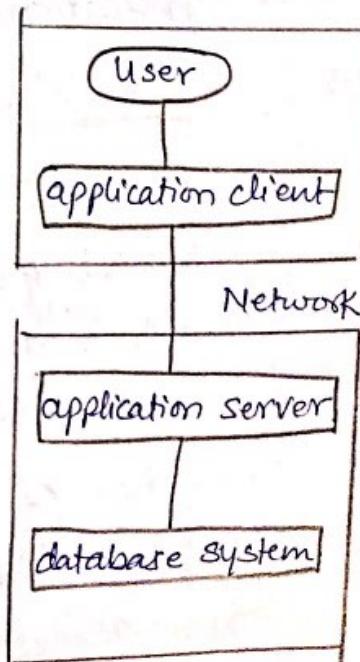
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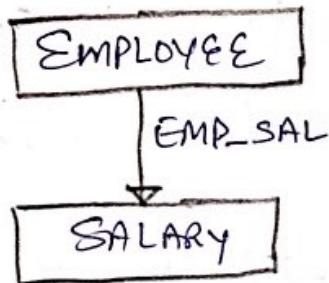
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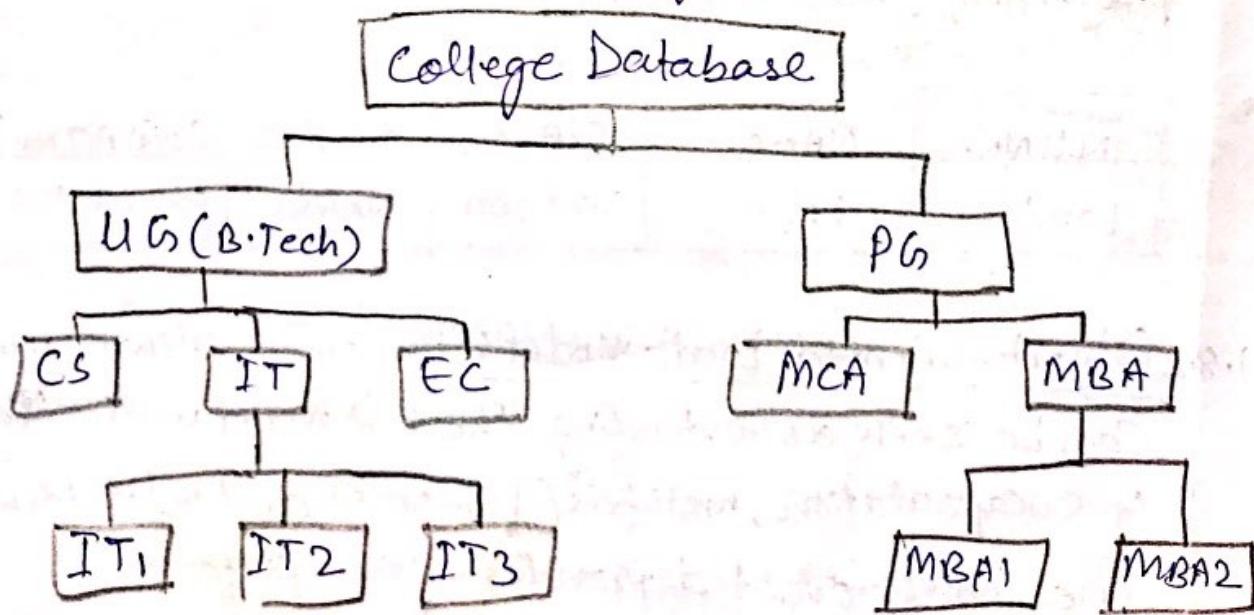
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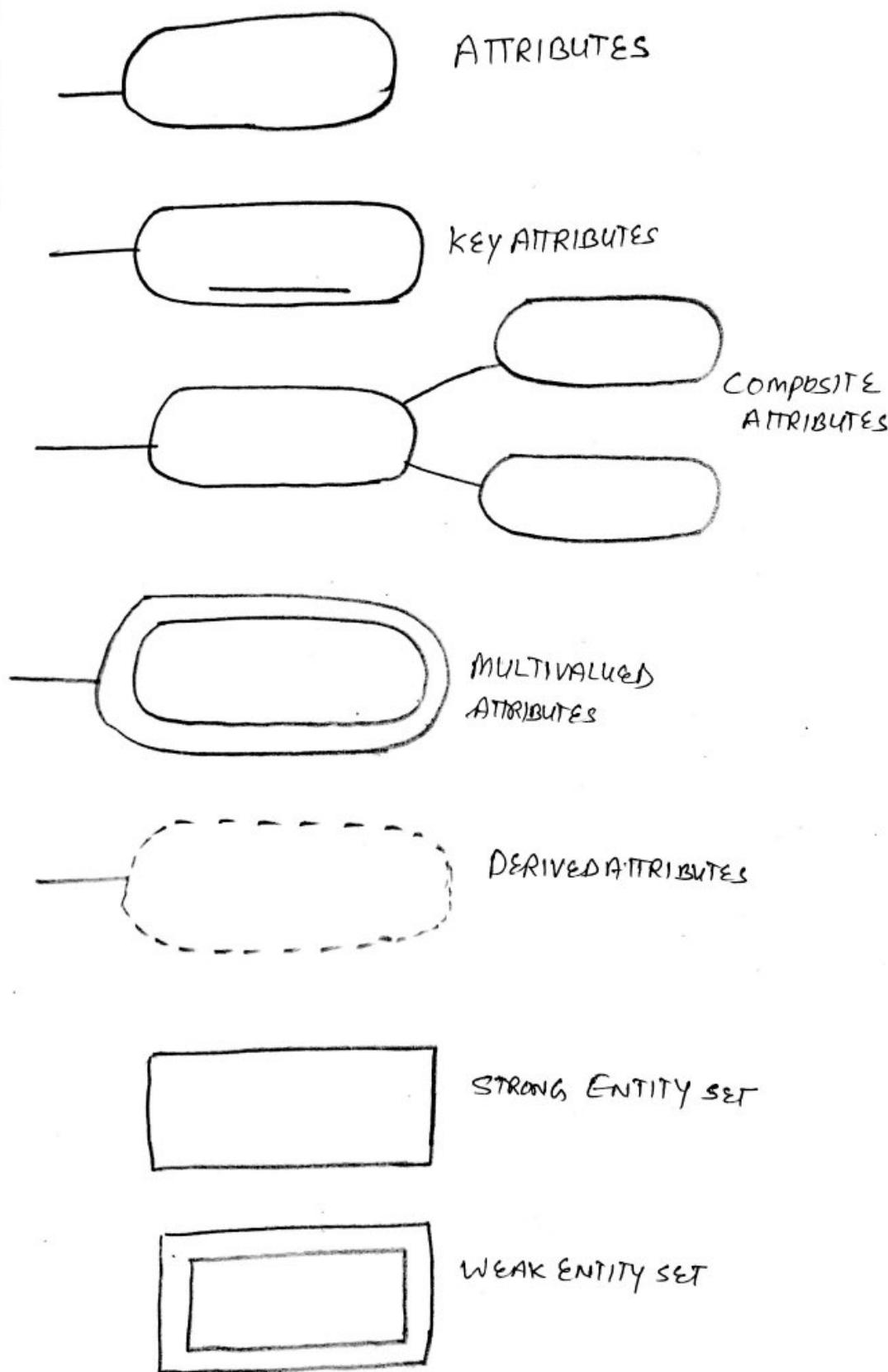
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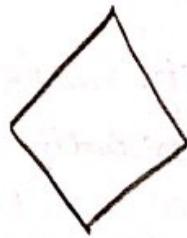
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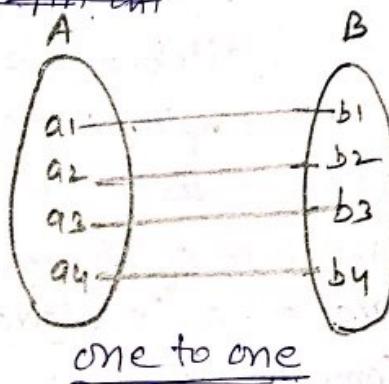
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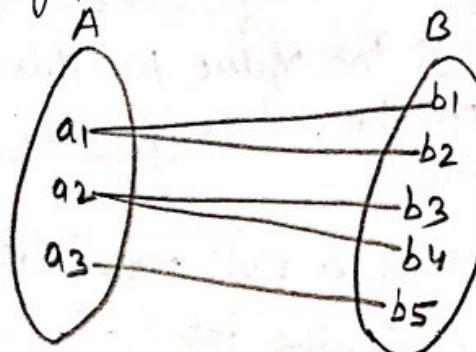
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2. One to Many:

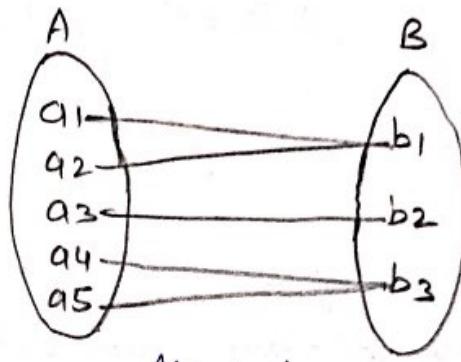


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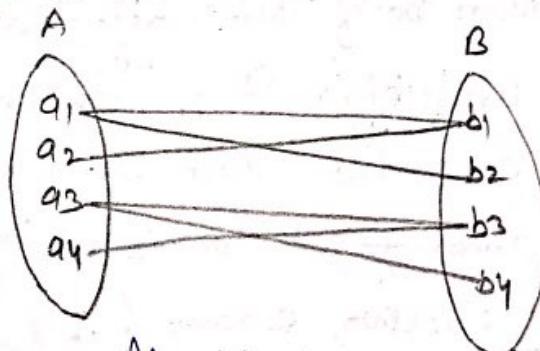
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