



## Assignment - 1

① With neat diagram explain the Database System environment  
→ DBMS is a collection of programs that enables user to create and maintain a database.

The DBMS is a "general-purpose S/W System that facilitates the process of defining, constructing, manipulating, and sharing databases among various users & applications.

i) Defining :-

a database involves specifying the data types, structures & constraints of the data to be stored in the database. The database definition or information is also stored by the DBMS in the form of a database catalog or dictionary; it is called meta-data.

ii) Constructing

the database is the process of storing the data on some storage medium that is constructed by the DBMS

iii) Manipulating

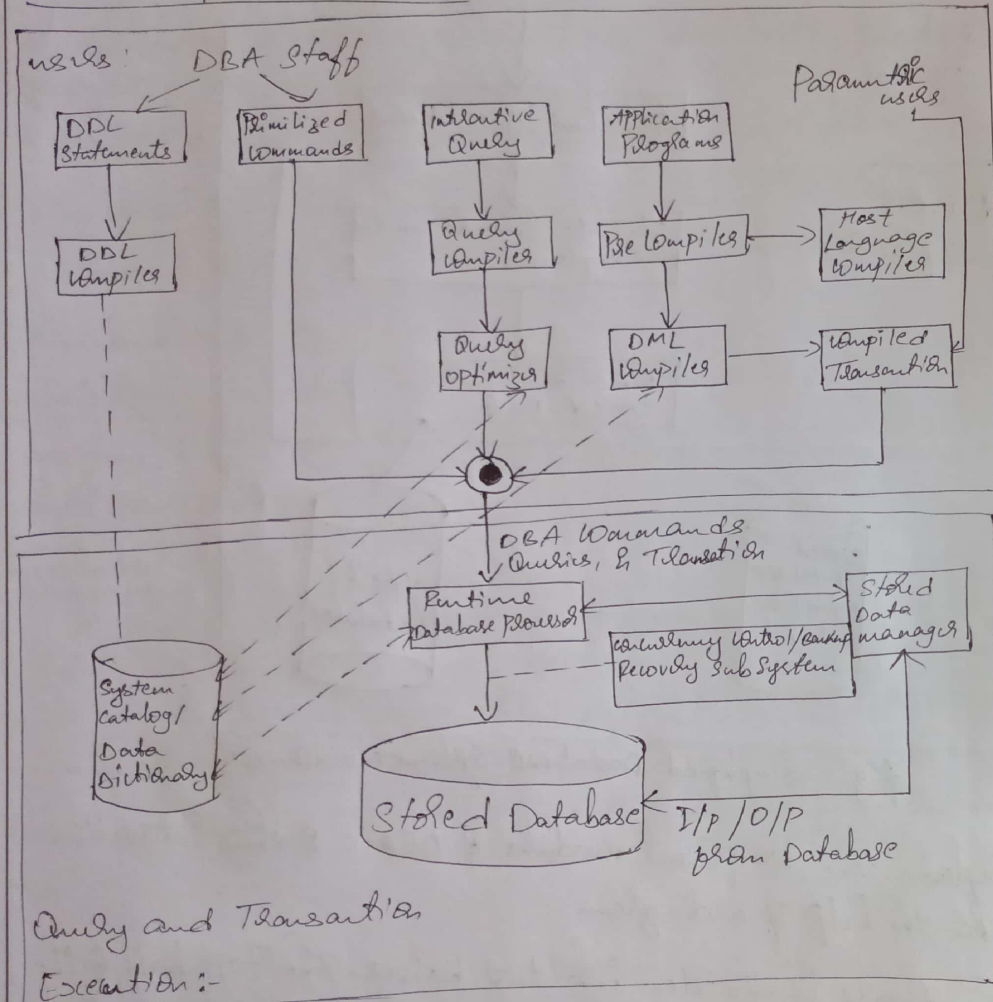
a database includes functions such as querying the database to retrieve specific data, updating the database to reflect changes in the mini world, and generating reports from the data.

iv) Sharing

a database allows multiple users & programs to access



## DBMS Components Modules.



The database & the DBMS catalog are usually stored on disk. Access to the disk is primarily controlled by operating system (OS), which includes disk input/output. A higher level stored data manager module of DBMS controls access to DBMS information that is stored on the disk.



If we consider the top half of the figure. It shows interfaces to DBA staff, casual users, application programmers and parametric users.

The DDL compiler processes schema definitions, specified in the DDL & stores the description of the schema in the DBMS catalog. The catalog includes information such as names & sizes of the files, datatypes of data items, storage details of each file, mapping information among schemas and constraints.

Casual users and persons with occasional need of information plan database interact using some form of interface which is interactive query interface. The queries are passed, analyzed for correctness of the operations for the model, the names of the data elements & so on by a query compiler that compiles them into internal form. The internal query is subjected to query optimization. The query optimizer is involved with rearrangement and possible including of operations, elimination of redundancies.

Application programmer writes programs in host languages. The precompiler extracts DML commands from an application program.

③ Explain with block diagram the different phases of database design.



## → Phase 1 :- Requirements Collection and Analysis

- \*) Interview perspective database users to Understand and document their data requirements
- \*) The results of this phase is concisely written set of users, requirements and functional requirements of the application consist of the user defined operations that will be applied to the database, and they include both deletions and updates.

## Phase 2 :- Conceptual Design

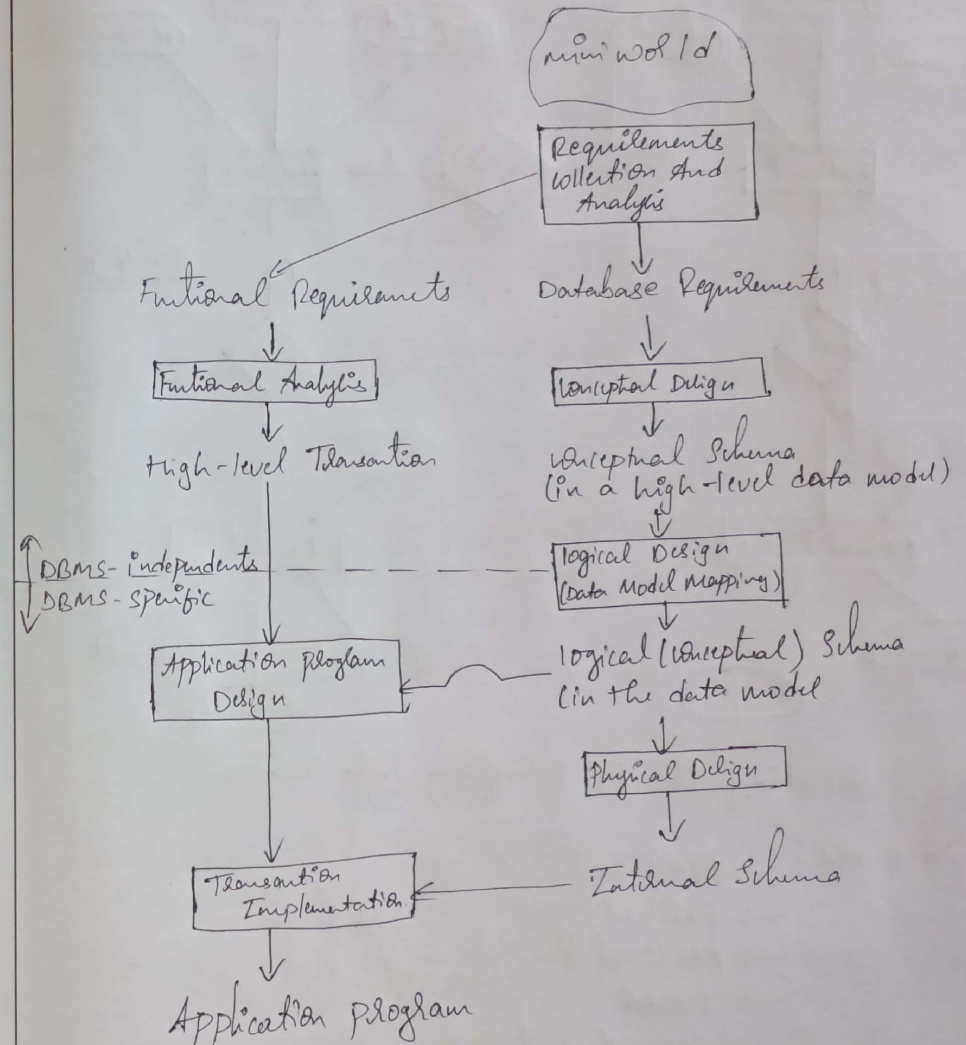
- \*) Conceptual schema for the database, using high-level conceptual Data Model. Because these concepts do not include implementation details, they are usually easier to understand and can be used to communicate with non-technical users. The high level conceptual schema can also be used as a reference to ensure that all users' data requirements are met and that the requirements do not include conflicts.
- \*) The result is conceptual schema in high level model.

## Phase 3 :- Logical design (data model mapping)

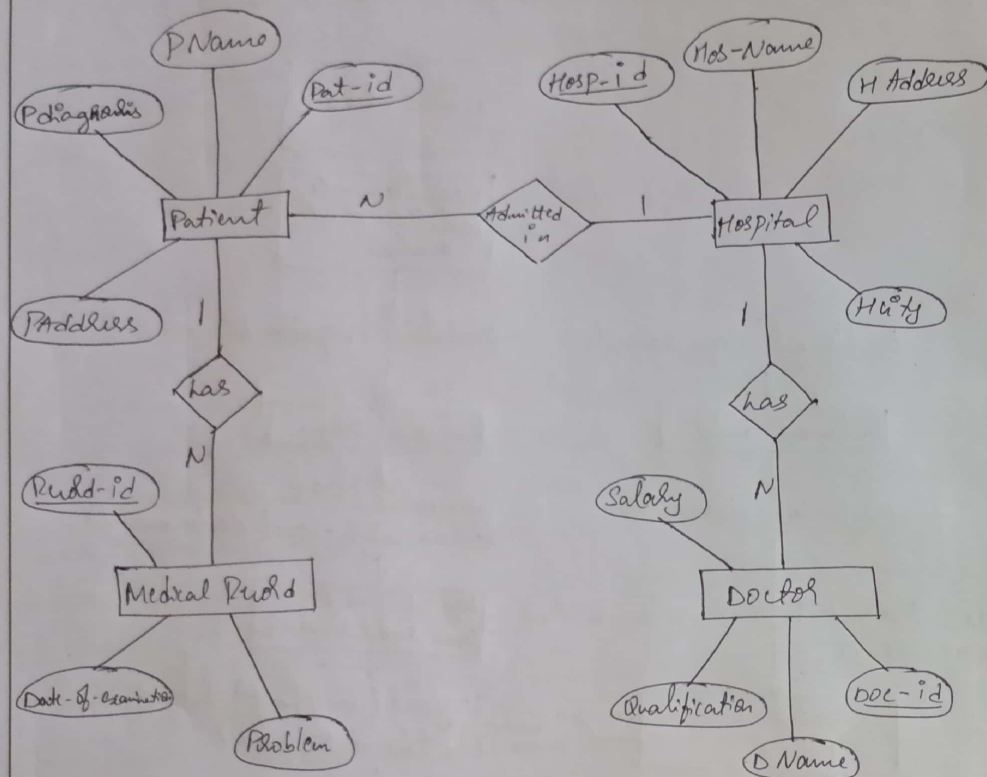
- \*) The actual implementation of a database, using a commercial DBMS; transformation of conceptual schema from the high level data model into implementation data model.
- \*) The result is Database schema in the implementation data model of the DBMS

## Phase 4 :-

The internal storage structures, access paths and file organization for the database files are specified.



- Q) Draw an ER diagram for hospital management including at least five entities.  
 ⇒ Step 1 : ER-Diagram.



Step 2 :- Converting the ER Diagram into Tables

Entities are :-  
 → Hospital  
 → Patient  
 → Medical Record  
 → Doctor  
 → Appointment

∴ Converting entity to table and attribute to columns.  
 → Hospital

Hosp-id	Primary Key
H City	
H Address	
Hos-Name	
Pat-id	Foreign Key depends to pat-id of Patient table
Doc-id	Foreign Key depends to Doc-id of Doctor table

→ Patient

Pat-id	
P Name	
P Address	
PDiagnosis	
Medd-id	Foreign Key depends to medd-id of medical Record table
Hosp-id	Foreign Key depends to Hosp-id of Hospital table

→ Medical Record

Medd-id	Primary Key
Problem	
Date-of-examination	
Pat-id	Foreign Key depends to Pat-id of Patient table



→ Doctor

DOC-id	Primary Key
D Name	
Qualification	
Salary	
HOSP-id	Foreign key reference to HOSP-id of Hospital table

→ Appointment

PID	Primary Key
PName	
PAddress	
PPhone NO	
HTimings	

Steps :- Mapping of Attributes.

Simple Attributes :- Simple Attributes which can not be divided into sub parts

Example :- Salary of doctor



→ Each patient has a lot of various test and examination conducted.  
Therefore the relation is 1 to many

⑤ ~~Draw~~ Composition Attributes :- Composite Attributes which can be divided into sub parts.

Example :- Patient Name, Doctor Name.

Patient

First-Name
Middle-Name
Last-Name

Doctor

First-Name
Middle-Name
Last-Name

Step 4 :- Mapping of Relationships

Foreign key approach

HOSP-Patient

Pat-id	Hospital table makes foreign key reference to Pat-id of Patient table
HOSP-id	Patient table makes foreign key reference to HOSP-id of hospital table.

Patient-Medical Record

Pat-id	Medical Record table makes foreign key reference to pat-id of Patient table
Recd-id	Patient table makes foreign key reference to Recd-id of medical Record table

Step 5 :- Identifying the relationships

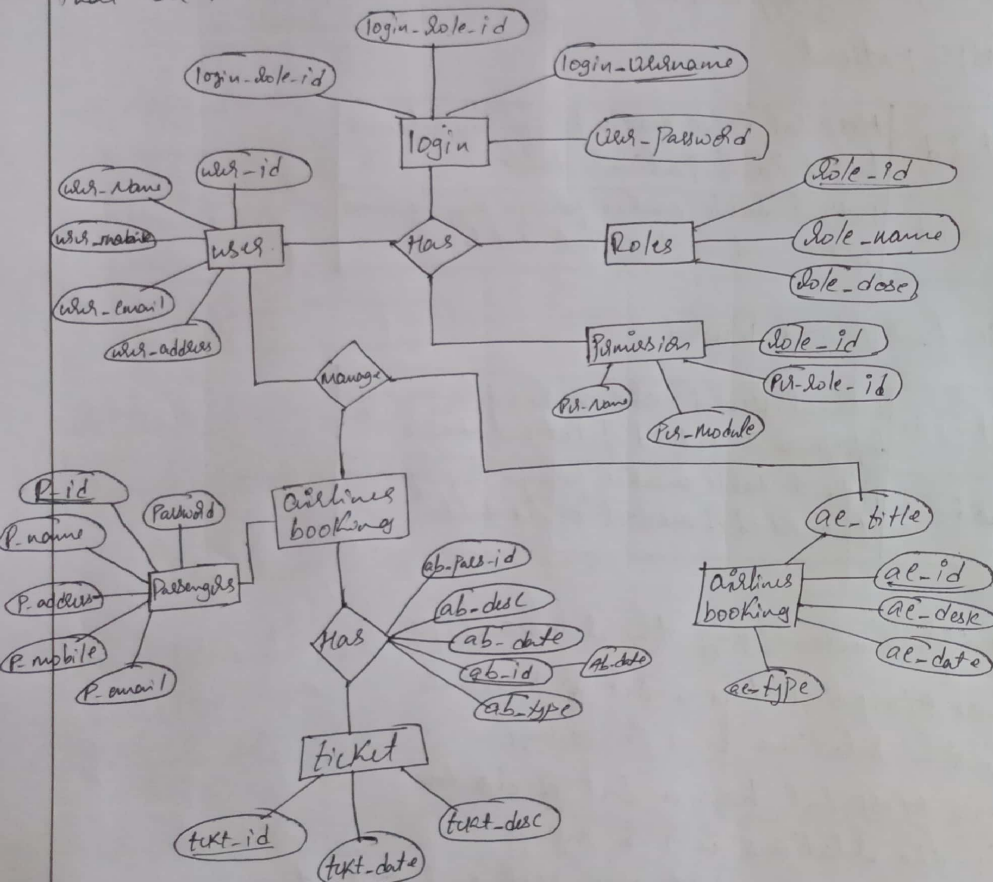
→ Hospital has a set of Patients  
∴ the relation is 1 to many

→ Hospital has a set of doctors  
∴ the relation is 1 to many

→ Doc id are associated with each patient  
∴ the relation is many to 1

→ Each patient has kind of various test and examination conducted.  
Therefore the relation is 1 to many.

⑤ Draw an ER diagram of an airline reservation system, taking into account at least five entities. Indicate all things, constraints and assumptions that are made.



Entities are :-

- login
- users
- Airline Booking
- Ticket
- Passengers

→ login:-

Field	Description	Type	Length
login-id	Login ID	Varchar	255
login-role-id	login-role id	Varchar	255
login-username	username	Varchar	255
Login-Password	Password	Varchar	255

→ users:-

Field	Description	Type	Length
user-id	user-id	Varchar	255
user-name	Name of the users	Varchar	255
user-mobile	Mobile Number	int	255
user-email	Email ID	Varchar	255
user-address	address	Varchar	255

→ Airline Booking:-

Field	Description	Type	Length
ab-desc	Booking description	Varchar	255



ab-date	Booking date	Varchar	255
ab-pass-id	Passenger Booking ID	Varchar	255
Ab-type	Booking type	Varchar	255
ab-ID	Booking ID	int	18

→ Ticket

Field	Description	Type	length
Ticket-id	Ticket ID	int	18
Ticket-desc	Ticket description	Varchar	255
Ticket-date	Ticket date	Varchar	255

→ Passengers:-

Field	Description	Type	length
P-mobile	Passenger mobile number	int	18
P-id	Passenger ID	Varchar	255
P-name	Passenger Name	Varchar	255
P-add	Passenger address	Varchar	255
P-pass	Passenger Password	Varchar	255

Step 1 :- We must familiarize ourselves with the entity relationship diagram cardinality & symbols. Then we have to show the data structure for the project in the entity relationship diagram. The symbol of entity relationship diagram shows how they fit together before making the ER diagram.

Symbol of entity relationship diagram:-

→ Fields:- This entity shows how the different type of data are used together for a project. The symbol is used

to show how the part of the project is working.

→ Key:- It is a type of technique that is used to categorize the quality of the data. There are two types of keys available for the database.

There are as follows:-

- 1) Primary Key:- It is a set of unique properties that are used for finding the specific entity.
- 2) A foreign key:- It is a type of key made up of a piece of data with two many links to other things.

Step 2 :- Finalize the entities included.

Start making your ER Diagram by deciding on all the parts your airline reservation system must have. You'll need to leave the area in your design for those entangles to be included later.

Step 3 :- Add the attributes of each entity.

After you have decided the entities, think about the traits you will need for each one. In a conceptual ER diagram, the details of the different entities are given as attributes. Attributes are thing ~~describing~~ a thing's traits, a many-to-many relationship, or a one-to-one relationship. Attributes with values can be given more than one value.

Step 4 :- Describe the relationships b/w entities & attributes. You will need the entities, their attributes & the relationships.



b/w them to plot the relationships b/w the BRD. to the right entity relationship diagram, you will use the information you gathered to build the data structures

### Assumption :-

we need to know how the Airline Reservation System was designed & built using diagrams. with the help of an ER diagram it will help us to make a system that works well.

Making it will help us to understand how the S/W works behind the scenes. This is where all the data that goes in & out of the system will be stored.