**DATA BASE :**

Collection of related data organized in away data can be easily accessed , managed and

* DDL , DML

DDL 🡪 schema

DML 🡪 query and updates

**DBMS :**

Is a software that provide the certain interface to perform the various operation on data base .

Feature : production and security

Data consistency

**Ad :** Segregation and application program

Minimal data duplication

Less data redundancy

Reduce development and maintenance

High storage capacity

**Dis :** complex

Costly and large size

**STATES :**

Data in a database at a particular part of time that is called data base state or snapshot or extension of schema .

**Empty state :**

When a database is define only the schema is specified .

**Initial state :**

When the data bass is loaded with data d=for a first time .

**Current state :**

The data in a database are updated frequently

**CHARACTERISTIC :**

**Reduce redundance** -> divides the data in such a way in repeat

**Security**

**Query language**

**Data stored in a table**

**Support multiple users and concurrent access**

**Data consistency** -> data that is continuous updated and added the consistency of data base can became a challenge .

* To make data meaning full and connected dbms and also allows to have relation b/w table
* Dbms support transaction which allow us to better handle and mange data integrity in real world application
* We can connect the database into different front end

**USERS TYPE :**

Naïve users :

Sophisticated user : BS , scientist ..there are interacted using query

Specialized user : write specialized database program

**DATA ABSTRACTION :**

Is a property buy which be high non essential feature from client .

|  |
| --- |
| View level |
| Conceptual level |
| Physical level |
| Data base |

* Logic level

* internal schema

**physical level :**

the lowest level of abs how the data is actually store

**Logical level :**

The higher level of abs that describes the what relationship exists.

**View level** :  
 the highest level of abs that describes the entire part of the data

**DATA INDEPENDENCE :**

* logical data
* physical data

**logical data :** ability to change the conceptual schema without affecting the external schema or application program

**physical data :** change the internal schema without affecting the external schema

**DATA BASE ARCHITECTURE :**

**1 tier , 2 tier , 3 tier , N tier**

**1 tier :** client – server -database all in the same system

**2 tier :** presentation layer runs on the client data is stored on the server - ODBC -> connection

Fat client-thin server 🡪 business and data logic collected in client side

Thin client – fat server 🡪 business and data logic collected in server side

**3 tier :**  presentation -> client

Application -> business tier

**N tier :**  also called distributed application

Similar to 3 tier architecture the no of application server is increased and represented individual tier in order to distributed the business logic so that will be distributed

**DATA MODEL :**

Flat filesystem

Hierarchical model

Network model

ER model

**OBJECT ORIENTED :**

Represented as a class

It contains data methods

Abstract class -> one class contains the another class as its attributes

**Entity Type :**

**Entity :** distinguish object that has an independent existence in the real world

Tangible entity :

Non tangible entity :

**OBJECT REALATIONAL MODEL :**

This is an hybrid database model that simplify the relationship with some of the advanced functionality of the object oriented data model .

* allow designer
* language an call interfaces include SQL3 , vendor languages , ODBC , JDBC

**NO SQL DATA BASE :**

The graph data base model which even through flexible than a network model allowing any node to connect with any other

The multi model which break from the relational model by allowing attribute to contains list od=f data rather than a single data point .

The document model that define to store and manage the document rather than atomic data .

**DATABASE TYPE :**

NoSQL database

Commercial database

Personal database

End user database

Operational database

Cloud database

Centralized database

RELATIONAL DATABASE :

These items are organized a set of tables with columns and rows

Col -> attribute row -> collection of related value are one object of entity

Each row in a table could be marked **primary key**

Rows among multiple table can be made related using **foreign key**

**PHASES OF DB DESIGN :**

**Requirement analysis** -> process of knowing and expectation of the user carried by team of analysts

DFD OOA (choice)

**Conceptual database design** ->

**Choice of a DBMS** -> cost , feature , portability hardware requirement .

**Logical database design**

**Physical database design**

**DATABASE SYSTEM IMPLEMENTATION :**

DDL statement

Testing and improvement

**A-C-I-D properties :**

* Atomicity -> all transaction are executed single unit
* Consistency -> no trans adversely affect the data that is residing on the system
* Durability -> the database should be durable enough to hold latest updates even if system fails or restart
* Isolation

LANGUAGE :

DDL -> used to define the database structure , no of table …etc

DML -> select , insert , update , delete , merge , call

DCL ->