DBMS TERMINOLOGY

What is a database system?

A Database Management System (DBMS) is system software used to manage the organization by storage, access, modification and integrity of data in a structured database.
A DBMS makes it possible for end users to create, read, update and delete data in a database systematically.
The DBMS essentially serves as an interface between the database and end users, ensuring that data is consistently organized and remains easily accessible.

Why do we need DBMS?

Manages big amounts of data
A database stores and manages a large amount of data on a daily basis. This would not be possible using any other tool such as a spreadsheet as they would simply not work.

Improved Data Sharing and Data Security
Proper database management systems help increase organizational accessibility to data, which in turn helps the end users share the data quickly and effectively across the organization.

Accurate
A database is pretty accurate as it has all sorts of built- in constraints, checks etc. This means that the information available in a database is guaranteed to be correct in most cases.

Easy to update data
In a database, it is easy to update data using various Data Manipulation languages (DML) available. One of these languages is SQL.

Effective Data Integration

Implementing a data management system promotes an integrated picture of an organization's operations. It becomes easy to see how processes in one segment of the organization affect other segments.

Easy to research data

It is very easy to access and research data in a database. This is done using Data Query Languages (DQL) which allow searching of any data in the database and performing computations on it.

① Data Reductancy → Occurs when same piece of info is present at two or more places. → Decreased by normalisation.

File System vs DBMS

Base	DBMS	Flat File System
Definition	DBMS is a collection of interrelated data and software programs to access those data.	Flat file system stores data in a plain text file. Here, the records are specified in a single line.
Data Redundancy	There is no problem of data redundancy. *	There is a main problem of data redundancy.
Cost	DBMS software is very costly and regular updates make it costly.	Flat file are cost effective
Use	Mostly, large organizations use DBMS who can afford it and have a large number of clients and employees to be managed.	Small organizations use it as it is cost effective and who have to deal with a small number of clients and employees.
Views	Views are created and employees can't see all information available, hence there is security.	Any information can be seen by anyone, hence there is no security.

INSTANCE

The data stored in a database at a particular moment of time is called an instance of the database. Database schema defines the variable declarations in tables that belong to a particular database; the value of these variables at a moment of time is called the instance of that database.

For example, let's say we have a single table student in the database, today the table has 100 records, so today the instance of the database has 100 records. Let's say we are going to add another 100 records in this table by tomorrow so the instance of the database tomorrow will have 200 records in the table.

Data structure Normalisation etc.

SCHEMA

Design of a database is called the schema. Schema is of three types: Physical schema, logical schema and view schema.

How data is stored in blocks of storage

→ *end view of database*

SUBSCHEMA

subschema is a subset or proper subset of the schema and inherits the same property that a schema has. The plan (or scheme) for a view is often called subschema. It gives the users a window through which he or she can view only that part of the database, which is of interest to him/her.

What is a data administrator?

A **data administration** (also known as a database administration manager, data architect, or information center manager) is a high level function responsible for the overall management of data resources in an organization. In order to perform its duties, the DA must know a good deal of system analysis and programming.

 Functions of a database administrator

1. Selection of hardware and software
   - Keep up with current technological trends
   - Predict future changes
   - Emphasis on established off the shelf products
2. Managing data security and privacy
   - Protection of data against accidental or intentional loss, destruction, or misuse
   - Firewalls
   - Establishment of user privileges
   - Complicated by use of distributed systems such as internet access and client/ server technology.