

INTRODUCTION OF DBMS

Database

- A database is a collection of related data
- Database collects related information's such as,
 - Names, phone number, address etc.,
 - Data/information can be stored in hard disk using MS Access, Excel, SQL etc.,
- Database plays a major role in all areas where computers are used,
 - Business, Library system, Engineering, Education, law, commerce, government etc.,
 - Banking, Airlines, Credit card transactions, finance, sales, on-line retailers, Manufacturing, Human Resources etc.,
- Database represents some aspects of real world. It is called as miniworld or Universe of Discourse (UoD).
- Database can be of any size and capacity.

DBMS

- Database Management System
- DBMS is a collection of interrelated data and a set of programs to access those data.
- DBMS is a collection of programs that enables users to create and maintain a database.
- Primary goal of DBMS → to provide a way to store and retrieve database information convenient and efficient.
- DBMS is a general purpose software system that facilitates the process of
 - **Defining**
 - Specifies data types, structures and constraints of data to be stored in database
 - **Construction**
 - Process of storing the data on storage medium.
 - **Manipulating**
 - Querying database to
 - Retrieve specific data
 - Update database to reflect changes
 - Generating reports from database
 - **Sharing**
 - Database allow multiple users and programs to access it simultaneously
- **Example**
 - A database that stores student information

Roll No	Name	Department	Grade
1	Tamil	CSE	A

2	Kavitha	IT	B
3	Selvan	CSE	A+
4	Kutty	ECE	A+

1. Purpose of Database System

- To see purpose database management systems, let us consider a "file-processing system" supported by a conventional operating system. System stores permanent records in various files,
 - it needs different application programs
 - to extract record from, and
 - add records to appropriate files.
- The application is a savings bank:
 - Savings account and customer records are kept in permanent system files.
 - Application programs are written to manipulate files to perform the following tasks:
 - Debit or credit an account.
 - Add a new account.
 - Find an account balance.
 - Generate monthly statements.
- **Disadvantages of file-processing approach:**
 - Data redundancy and inconsistency
 - Same information may be duplicated in several places.
 - All copies may not be updated properly.
 - Difficulty in accessing data
 - May have to write a new application program to satisfy an unusual request.
 - E.g. find all customers with the same postal code.
 - Could generate this data manually, but a long job...
 - Data isolation
 - Data in different files.
 - Data in different formats.
 - Difficult to write new application programs.
 - Multiple users
 - Want concurrency for faster response time.
 - Need protection for concurrent updates.
 - E.g. two customers withdrawing funds from the same account at the same time - account has \$500 in it, and they withdraw \$100 and \$50. The result could be \$350, \$400 or \$450 if no protection.
 - Security problems
 - Every user of the system should be able to access only the data they are permitted to see.

- E.g. payroll people only handle employee records, and cannot see customer accounts; tellers only access account data and cannot see payroll data.
- Difficult to enforce this with application programs.
- Integrity problems
 - Data may be required to satisfy constraints.
 - E.g. no account balance below \$25.00.
 - Again, difficult to enforce or to change constraints with the file-processing approach.

These problems and others led to the development of **database management systems**.