**EXPERIMENT NO: 01**

**Title**: Study of DBMS with advantages and disadvantage.

**Aim:**Study of DBMS with advantages and disadvantage.

**Theory:DBMS (Database Management System)**

A DBMS is software that allows creation, definition and manipulation of database, allowing users to store, process and analyze data easily. DBMS provides us with an interface or a tool, to perform various operations like creating database, storing data in it, updating data, creating tables in the database and a lot more.

DBMS also provides protection and security to the databases. It also maintains data consistency in case of multiple users.

**Here are some examples of popular DBMS used:**

* MySql
* Oracle
* SQL Server
* IBM DB2
* PostgreSQL
* Amazon SimpleDB (cloud based) etc.

**Characteristics of Database Management System:**

A database management system has following characteristics:

1. Data stored into Tables: Data is never directly stored into the database. Data is stored into tables, created inside the database. DBMS also allows having relationships between tables which makes the data more meaningful and connected. You can easily understand what type of data is stored where by looking at all the tables created in a database.
2. Reduced Redundancy: In the modern world hard drives are very cheap, but earlier when hard drives were too expensive, unnecessary repetition of data in database was a big problem. But DBMS follows Normalization which divides the data in such a way that repetition is minimal.
3. Data Consistency: On Live data, i.e. data that is being continuously updated and added, maintaining the consistency of data can become a challenge. But DBMS handles it all by itself.
4. Support Multiple user and Concurrent Access: DBMS allows multiple users to work on it (update, insert, and delete data) at the same time and still manages to maintain the data consistency.
5. Query Language: DBMS provides users with a simple Query language, using which data can be easily fetched, inserted, deleted and updated in a database.
6. Security: The DBMS also takes care of the security of data, protecting the data from un-authorized access. In a typical DBMS, we can create user accounts with different access permissions, using which we can easily secure our data by restricting user access.
7. DBMS supports transactions, which allows us to better handle and manage data integrity in real world applications where multi-threading is extensively used.

**Advantages of DBMS**

* Segregation of application program.
* Minimal data duplicity or data redundancy.
* Easy retrieval of data using the Query Language.
* Reduced development time and maintenance need.
* With Cloud Datacenters, we now have Database Management Systems capable of storing almost infinite data.
* Seamless integration into the application programming languages which makes it very easier to add a database to almost any application or website.

**Disadvantages of File System:**

1. Data redundancy and inconsistency
2. Difficulty in accessing data
3. Data isolation — multiple files and formats
4. Integrity problems
5. Atomicity of updates
6. Concurrent access by multiple users
7. Security problems

**Disadvantages of DBMS**

* It's Complexity
* Except MySQL, which is open source, licensed DBMSs are generally costly.
* They are large in size.

**Conclusion:**

Thus we, have studied DBMS with its advantages and disadvantages successfully.

**EXPERIMENT NO: 02**

**Title**: Study of RDBMS with advantages and disadvantage.

**Aim:**Study of RDBMS with advantages and disadvantage.

**Theory:**

**RDBMS (Relational Database management System)**

A Relational Database management System (RDBMS) is a database management system based on the relational model introduced by E.F Codd. In relational model, data is stored in relations (tables) and is represented in form of tuples (rows).

RDBMS is used to manage Relational database. Relational database is a collection of organized set of tables related to each other, and from which data can be accessed easily. Relational Database is the most commonly used database these days.

In relational model in which data is stored in multiple tables where tables are related to each other using primary keys and foreign keys and indexes. RDBMS uses database normalization techniques to avoid redundancy in tables. It helps to fetch data faster using SQL query. It is widely used by enterprises and software developers to store large amount of complex data  
Examples:

* SQL server,
* Oracle
* MySQL
* MariaDB
* SQLite

**Important Concept Related to RDBMS:**

**Table:**

In Relational database model, a table is a collection of data elements organized in terms of rows and columns. A table is also considered as a convenient representation of relations. But a table can have duplicate row of data while a true relation cannot have duplicate data. Table is the simplest form of data storage. Below is an example of an Employee table.

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Name** | **Age** | **Salary** |
| 1 | Adam | 34 | 13000 |
| 2 | Alex | 28 | 15000 |
| 3 | Stuart | 20 | 18000 |
| 4 | Ross | 42 | 19020 |

**Tuple:**

A single entry in a table is called a Tuple or Record or Row. A tuple in a table represents a set of related data. For example, the above Employee table has 4 tuples/records/rows.

Following is an example of single record or tuple.

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | Adam | 34 | 13000 |

**Attribute:**

A table consists of several records (row), each record can be broken down into several smaller parts of data known as Attributes. The above Employee table consists of four attributes, ID, Name, Age and Salary.

**Attribute Domain:**

When an attribute is defined in a relation (table), it is defined to hold only a certain type of values, which is known as Attribute Domain. Hence, the attribute Name will hold the name of employee for every tuple. If we save employee's address there, it will be violation of the Relational database model.

|  |
| --- |
| Name |
| Adam |
| Alex |
| Stuart - 9/401, OC Street, Amsterdam |

**Advantages of RDBMS**

* It is easy to use.
* It is secured in nature.
* The data manipulation can be done.
* It limits redundancy and replication of the data.
* It offers better data integrity.
* It provides better physical data independence.
* It offers logical database independence i.e. data can be viewed in different ways by the different users.
* It provides better backup and recovery procedures.
* It provides multiple interfaces.
* Multiple users can access the database which is not possible in DBMS.

**Disadvantages of RDBMS**

* Software is expensive.
* Complex software refers to expensive hardware and hence increases overall cost to avail the RDBMS service.
* It requires skilled human resources to implement.
* Certain applications are slow in processing.
* It is difficult to recover the lost data.

**Conclusion**: Thus we, have studied , RDBMS with its advantages and disadvantages successfully.