Notes:

1. In short, DBMS concepts and techniques help in the efficient management of data.

Purpose

All business activities deal with a lot of data.

Examples:

* Schools, colleges and universities store data about students, courses, trainers, etc.
* Banks store data about their customers, transactions (deposits, withdrawals), loans, etc.

The knowledge of DBMS enables a software engineer to:

* Store data
* Access data
* Modify data
* Delete data
* Share data among the different users
* Ensure security of the data

Transaction

* A group of processing steps that are treated as a single activity to achieve a desired result. In DBMS, collections of operations that form a single logical unit of work are called transactions. A database system ensures proper execution of transactions despite failures – either the entire transaction executes, or none of it does.

Concurrent

* Concurrent access implies that different users can access the same piece of data at the same time.

Sharing

* The data in the database can be shared. Sharing means individual pieces of data in the database can be shared among different users. Each of those users can have access to the same piece of data. They can use the data for different purposes.
* Example of Users:

User in the Bank’s Loan Department

User in the Bank’s Fixed Deposit Department

Database In Short

* A database is an organized collection of interrelated data
* Data in the database:
* Is integrated
* Can be shared
* Can be concurrently accessed

Database Management System (DBMS)

* A Database Management System (DBMS) is a collection of interrelated files and a set of programs that allow users to access and modify these files. The primary goal of a DBMS is to provide a convenient and efficient way to store, retrieve and modify information.

The database systems are designed to:

* Define structures for the storage of data
* Provide mechanisms for the manipulation of data
* Ensure the safety of the data stored, despite system crashes or at tempts at unauthorized access
* Share data among the different users
* In short, database systems are designed to manage large volumes of data.

End User

* The person for whom a system is being developed. Example: a bank teller or a bank manager is an end user of a bank system.

Manipulation

* Data manipulation refers to the addition of new data, modification of existing data, etc.

SQL

* Structured Query Language. A language used by relational databases to query, update and manage data.

Abstraction

* A simplified representation of something that is potentially quite complex. It is often not necessary to know the exact details of how something works, is represented or is implemented, because it can still be used in its simplified form.

Master File

* A master file is used to store relatively static data about some entity

Transaction Files

* A transaction file contains relatively transient (temporary) data about a particular data processing task.

Table

* A table has a specified number of columns but can have any number of rows. Rows stored in a table are structurally equivalent to records from flat files.

Entity

* An entity is a “thing” or “object” in the real world that is distinguishable from other objects.
* Example: each person is an entity, and bank accounts can be considered to be entities.

A master file

* Stores relatively static data about an entity
* Changes rarely

A transaction file

* Stores relatively transient data about a particular data processing task
* Changes frequently as transactions happen more periodically and in large numbers

Data Redundancy

* Often the same information is duplicated in two or more files
* Duplication of data (redundancy) leads to higher storage and access cost. In addition it may lead to data inconsistency

Queries

* A query is essentially a request that a user makes on the database.

Integrity Constraints

* A set of rules to ensure the correctness and accuracy of data.

View

* A view is a virtual table in the database defined by a query.

Constraints

* Restriction, limitation.

Inconsistency

* Lacking uniformity or agreement.

Data Models

* A data model is a conceptual tool to describe data, data relationships, data semantics and consistency constraints.

Object Based Logical Model

* The E-R Model is based on the percept ion of the real world that consists of a collection of basic objects called entities, and of relationships among these objects.