Important Notes:

1. 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.
2. Concurrent access implies that different users can access the same piece of data at the same time.
3. A database is an organized collection of interrelated data

Data in the database:

O Is integrated

O Can be shared

O Can be concurrently accessed

1. 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.
2. 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 attempts at unauthorized access
* Share data among the different users

In short, database systems are designed to manage large volumes of data.

1. 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.
2. Manipulation: Data manipulation refers to the addition of new data, modification of existing data, etc.
3. Flat Files: A flat file is a file containing records that has no structured interrelationship. Files used in programming fundamentals (PF) projects were essentially flat files
4. SQL: (Structured Query Language). A language used by relational databases to query, update and manage data.
5. Fourth Generation Language (4GL): A 4GL is typically non-procedural and designed so that end users can specify what they want without having to know how the computer will process their requirement.
6. 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.
7. A master file is used to store relatively static data about some entity.
8. A transaction file contains relatively transient data about a particular data processing task.
9. 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.
10. A master file

O Stores relatively static data about an entity

O Changes rarely

1. A transaction file

O Stores relatively transient data about a particular data processing task

O Changes frequently as transactions happen more periodically and in large numbers

1. Constraints: Restriction, limitation.
2. Inconsistency: Lacking uniformity or agreement.
3. Centralized: Systems where decision making, flow of data, or the beginning of activities are initiated at the same central point and disseminated to remote points in the organization

Points to Remember:

Disadvantages of the traditional file approach:

O Data Security – Data easily accessible by all and therefore not secure

O Data Redundancy – Same data is duplicated in two or more files which may lead to update anomalies

O Data Isolation – All the related data is not available in one file. Thus writing a new application program is difficult

O Program / Data Dependence – Application programs are data dependent it is impossible to change the physical representation (how the data is physically represented in storage) or access technique (how it is physically accessed) without affecting the application

O Lack of Flexibility – Only pre-determined requests for information can be met. It is not flexible enough to satisfy unanticipated queries

O Concurrent Access Anomalies – Same piece of data is allowed to be updated simultaneously which leads to inconsistencies

1. Queries: A query is essentially a request that a user makes on the database.
2. Integrity Constraints: A set of rules to ensure the correctness and accuracy of data.
3. A local transaction is one that accesses data in the single site at which the transaction was initiated
4. A global transact ion, on the other hand, is one which either accesses data in a site different from the one at which the transact ion was initiated, or access data in several different sites.
5. Homogeneous: All the same; uniform; harmonized.
6. Heterogeneous: Varied; mixed; diverse.
7. The overall design of the database is called database schema. In general, database systems support one internal schema, one conceptual schema and several external schemas.
8. Database Administrator: The DBA administers the DBMS and is in charge of creating, maintaining and modifying all the three levels of the DBMS. The DBA also controls the allocation of system resources, grants/ revokes access privileges to/ from users and ensures the consistency of the database.
9. Attribute: The literal meaning is quality; characteristic; trait or feature. Entities are described in a database by a set of attributes. For example, in the bank system, Cust\_ID, Cust\_Email, etc. describe Customer-Detail entity set.
10. View: A view is a virtual table in the database defined by a query.
11. The external view is how the customer, Mike A Smith views it. The conceptual view is how the DBA views it. The internal view is how the data is actually stored.
12. External View --> representation of the data to the user. Conceptual View -->how the store to the database and what types of data store to the database. Internal View --> how the data actually store to the database such as length and size of the data and so on.
13. A data model is a conceptual tool to describe data, data relationships, data semantics and consistency constraints.