Normalization

Normalization:
A process of organizing the data in the database to avoid data redundancy, insertion anomaly, update anomaly & deletion anomaly.
A process of organizing data into tables in such a way that the results of using the database are always unambiguous and as intended. Such normalization is intrinsic to relational database theory. It may have the effect of duplicating data within the database and often results in the creation of additional tables.

Advantages of Normalization
- ❖ Elimination of data redundancy makes the database to be compact reducing the overall amount of space a database consumes.
- ❖ Enforcement of referential integrity on data ensuring data to be consistent across all tables.
- ❖ Maintenance becomes easier and faster since the data are organized logically in a normalized database in a flexible way.
- ❖ Searching and sorting of records is easier and faster because data will appear in a separate, smaller table when a database is normalized allowing us to easily find them.

Difference between Normalization and Denormalization
- ❖ Normalization and denormalization are two processes that are completely opposite.
- ❖ Normalization is the process of dividing larger tables into smaller ones reducing the redundant data, while denormalization is the process of adding redundant data to optimize performance.
- ❖ Normalization is carried out to prevent database anomalies.

- ❖ Denormalization is usually carried out to improve the read performance of the database, but due to the additional constraints used for denormalization, writes (i.e. insert, update and delete operations) can become slower. Therefore, a denormalized database can offer worse write performance than a normalized database.

❖ It is often recommended that you should "normalize until it hurts, denormalize until it works".

❖ Normalizing data means eliminating redundant information from a table and organizing the data so that future changes to the table are easier.