**1. Why do we need database in real time applications?**

A database is a collection of data, usually stored in electronic form. A database is typically designed so that it is easy to store and access information.

A good database is crucial to any company or organization. This is because the database stores all the pertinent details about the company such as employee records, transactional records, salary details etc.

**The various reasons a database is important are −**

## **Manages large amounts of data**

A database stores and manages a large amount of data on a daily basis. This would not be possible using any other tool such as a spreadsheet as they would simply not work.

## **Accurate**

A database is pretty accurate as it has all sorts of built-in constraints, checks etc. This means that the information available in a database is guaranteed to be correct in most cases.

## **Easy to update data**

In a database, it is easy to update data using various Data Manipulation languages (DML) available. One of these languages is SQL.

## **Security of data**

Databases have various methods to ensure security of data. There are user logins required before accessing a database and various access specifiers. These allow only authorized users to access the database.

## **Data integrity**

This is ensured in databases by using various constraints for data. Data integrity in databases makes sure that the data is accurate and consistent in a database.

## **Easy to research data**

It is very easy to access and research data in a database. This is done using Data Query Languages (DQL) which allows searching of any data in the database and performing computations on it.

**2. What are the advantages of database over text files?**

**Advantages of database over text files: -**

* Databases provide data integrity between the file and its metadata.
* Database security is available by default.
* Backups automatically include files, no extra management of file system necessary.
* Database indexes perform better than file system trees when more number of items are to be stored.
* Database tables are much better when you want to store many rows with the exact same structure, need lightning-fast lookup/sorting by more than one value, need atomic transactions, or your users will read/write the same data all the time.

**3. What is normalization? Why do we need it?**

Normalization is the process of structuring and handling the relationship between data to minimize redundancy in the relational table and avoid the unnecessary anomalies properties from the database like insertion, update and delete. It helps to divide large database tables into smaller tables and make a relationship between them. It can remove redundant data and it is easy to add, manipulate or delete table fields.

A normalization defines rules for the relational table as to whether it satisfies the normal form. A normal form is a process that evaluates each relation against defined criteria and removes the multivalued, joins, functional and trivial dependency from a relation. If any data is updated, deleted or inserted, it does not cause any problem for database tables and helps to improve the relational table's integrity and efficiency.

## Need of Normalization: -

1. It is used to remove the duplicate data and database anomalies from the relational table.
2. Normalization helps to reduce redundancy and complexity by examining new data types used in the table.
3. It is helpful to divide the large database table into smaller tables and link them using relationship.
4. It avoids duplicate data or no repeating groups into a table.
5. It reduces the chances for anomalies to occur in a database.

**4. What are SQL, SQL Server, MySql?**

**SQL: -** SQL or Structured Query Language is a critical tool for data professionals. It is undoubtedly the most important language for getting a job in the field of data analysis or data sciences.

Millions of data points are being generated every minute and raw data does not have any story to tell. After all this data gets stored in databases and professionals use SQL to extract this data for further analysis.

**SQL Server: -** SQL Server is a relational database management system, or RDBMS, developed and marketed by Microsoft.

Similar to other RDBMS software, SQL Server is built on top of [SQL](https://www.sqltutorial.org/), a standard programming language for interacting with relational databases. SQL Server is tied to Transact-SQL, or T-SQL, Microsoft’s implementation of SQL that adds a set of proprietary programming constructs.

**My SQL: -** MySQL is open-source and user-friendly. It creates a database to store and manipulate the data. To perform various operations users make requests by typing specific statements. The server responds to the information from the user and Displays it on the user side.

**5. What are the Authentication modes in SQL Server?**

SQL Server supports two authentication modes, Windows authentication mode and mixed mode.

* Windows authentication is the default and is often referred to as integrated security because this SQL Server security model is tightly integrated with Windows. Specific Windows users and group accounts are trusted to log in to SQL Server. Windows users who have already been authenticated do not have to present additional credentials.
* Mixed mode supports authentication both by Windows and by SQL Server. User name and password pairs are maintained within SQL Server.