Important terms in DBMS

Data

Data is a general term for specific facts, statistics, or pieces of knowledge, frequently numerical. Technically speaking, a datum is a single value of a single variable, whereas data is a collection of values for qualitative or quantitative variables concerning one or more individuals or things.

Data is information that has been transformed into a format that is useful for transfer or processing in computing. Data is information that has been transformed into binary digital form for use with modern computers and transmission mediums. The topic of data may be used in either the singular or the plural.

Data are pieces of information that have been converted into a format that can be moved or processed quickly. Relative to today's computers and transmission media, data is information converted into binary digital form.

Database

A database is a structured collection of material that has been arranged and is often kept electronically in a computer system. A database management system often oversees a database (DBMS).

A database is a type of data structure used to hold organized data. Most databases have numerous tables, each of which could have a number of unique fields. Tables covering products, workers, and financial information, for instance, might be present in a firm database.

Any type of data can be stored, maintained, and accessed using databases. They gather data on individuals, locations, or objects. It is gathered in one location so that it can be seen and examined. You might think of databases as a well-organized collection of data.

Because they transmit data about your sales transactions, product inventory, customer profiles, and marketing activities, database systems are crucial to your company.

Almost every industry employs databases, including banks, retail, online, and warehouses. To track customer accounts, balances, and deposits, banks use databases. Databases can be used by retail stores to hold information on inventory, sales, customers, and prices.

Databases management system

Data is stored, retrieved, and analysed using software called database management systems (DBMS). Users can create, read, update, and remove data in databases using a DBMS, which acts as an interface between them and the databases.

Essentially, a database management system (or DBMS) is just a computerised data-keeping system. Users of the system are provided with the ability to carry out a variety of actions on such a system for either managing the database structure itself or manipulating the data in the database.

MySQL, PostgreSQL, Microsoft Access, SQL Server, FileMaker, Oracle, RDBMS, dBASE, Clipper, and FoxPro are a few DBMS examples.

A database system's primary purpose

In a database system, the database schema is specified using a data definition language, and database queries and modifications are expressed using a data manipulation language. Having centralized control over the data and the applications that access it is one of the key benefits of using DBMSs.

The components of a DBMS

Analyzing Big Data with a DBMS. The elements of a DBMS are composed of hardware, software, data, database access language, procedures, and users. Let's clearly go over each element one at a time. Hardware. The actual computer system used to store and access the database is known as the hardware.

Database application

A database application a computer software whose main function is to retrieve data from a digital database. From this point, data can be added, changed, or removed and then transmitted back into the database.

These are a few instances of such applications: Online dictionaries (Wikipedia) social media platforms (Facebook) CRM programs (Salesforce)

Database applications' primary goal is to provide a means for data to be consumed by end users (through UI) or other more sophisticated applications (via APIs). A database application can be used to execute transactions, store and retrieve data, or do various machine learning calculations.

For instance, when a user logs into their Facebook account, Facebook authenticates them using a user database. Facebook does, however, allow other applications to access its user database. This is accomplished using a secure API that Facebook makes available, and you can undoubtedly see examples of this on many of the platforms that are already in use.

MongoDB Atlas, a platform for Data-as-a-Service, is another example. The data can be accessed in a variety of ways with Atlas clusters, such as through a driver, a Realm serverless function, or even MongoDB Charts, which can be used to create dashboards based on Atlas data.

Data independence

For a centralized DBMS, data independence is the kind of data openness that is important. It alludes to the user applications' resistance to modifications made to the definition and arrangement of data. Ideally, application programs shouldn't be made aware of the specifics of data storage and representation.

According to the definition of data independence, a DBMS's ability to alter the database schema at one level of a database system without also needing to update it at a higher level is a key feature. You can maintain data independence by keeping it separate from any programs that use it.

Data independence enables schema changes at one level without requiring schema changes at higher levels. It aids in enhancing the database's data security. Physical data independence allows us to modify the database's file and storage organization without having any negative effects on the application program

Data independence absents from file systems, and it means that when you can alter the storage specifications without impairing a program's ability to access the data, you can say that data independence has occurred. Any application that accesses a file system's file must instruct the computer on how to perform the action as well as what action to take.

Security

Restricting access to the data base by unauthorised users must be a feature of the DBMS security system. By setting up user accounts and using the DBMS to manage login procedures, access control is accomplished.

The many precautions businesses take to guarantee their databases are safe from both internal and external threats are together referred to as database security. The different applications that access a database as well as the database itself, the data it holds, its database management system, and other components are all protected by database security.

Database security refers to the application of a wide range of information security rules to safeguard databases from breaches of their availability, confidentiality, and integrity. It involves a variety of controls, including technical, procedural/administrative, and physical controls.

Importance

Because it is impossible to preserve your competitive advantage if intellectual property is stolen, you must take comprehensive database security precautions. Your brand's reputation suffers when database security is compromised. If there is a breach, certain businesses won't continue to run.

Integrity

When a database is designed, data integrity is mandated, and it is authenticated over time by routines for error checking and validation. For instance, numeric columns or cells shouldn't take data in alphabetical order to preserve data integrity.

A database, data warehouse, data mart, or other structure's accuracy and consistency of data are all included under the umbrella term "data integrity" in its broadest sense. Data integrity is a phrase that can refer to a state, a process, or a function and is frequently used as a stand-in for "data quality."

Entity integrity, referential integrity, and domain integrity are three different types of integrity requirements that are built into the relational data architecture. The idea of a primary key is relevant to entity integrity.

Data security is the safeguarding of information against unauthorised users. Data integrity refers to the accuracy and consistency of the data in the database. The database's data must adhere to specific sorts of constraints in order to serve this goal (rules).

View

Like a true table, a view also has rows and columns. A view contains fields from one or more actual database tables. A view can be extended with SQL statements and functions to present data as though it were drawn from a single table. The CREATE VIEW statement produces a view.

In SQL, views are a subset of virtual tables. The rows and columns of a view are identical to those in a database's actual table. By choosing fields from one or more database tables, we can build a view. A view may include all table rows or only certain rows according to a set of criteria.

In the database design approach known as normalization, the first assumption made about data is

A) there is no redundancy in the data.

B) the delete anomaly will not apply since all customer records will be maintained indefinitely

C) everything is initially stored in one large table.

D) the data will not be maintained in 3NF tables.

Step 1:

Data in a database are arranged by a process called normalisation. In order to secure the data and increase the database's flexibility by removing redundancy and inconsistent reliance, this involves constructing tables and defining relationships between those tables in accordance with rules.

The practise of rearranging data in a database to ensure that it satisfies two essential criteria is called normalisation. There is no redundant data because it is all kept in one location. All related data items are stored together due to logical data dependencies.

Step 2: Answer with Explanation

Option C everything is initially stored in one large table.

Explanation

Data is organised into tables and kept in databases.

This requires that all of the data be kept in a consistent manner. Tables were developed for this reason. The simplest objects (structures) for storing data in a database are tables.