Models in Dbms

Session

On

SQL

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What are Databases?

- A database is a collection of data that is organized and stored in a structured format, allowing for easy access, manipulation, and analysis of the data.
- Databases can be used to store a wide variety of data, including financial records, customer information, inventory records, and more.
- Overall, databases are an essential tool for storing and managing data in a way that is organized, efficient, and secure.

1.Hierarchical Model

- A hierarchical data model is the oldest type of the data model. It was developed by IBM in 1968. It organizes data in a tree-like structure. Hierarchical model consists of the following :
- It contains nodes which are connected by branches.
- The topmost node is called the root node.
- If there are multiple nodes appear at the top level, then these can be called root segments.
- Each node has exactly one parent.
- One parent may have many children.
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2.Network Model

- It is the advance version of the hierarchical data model. To organize data it uses directed graphs instead of the tree-structure. In this child can have more than one parent. It uses the concept of the two data structures i.e. Records and Sets
- Project is the root node which has two children i.e. Project 1 and Project 2. Project 1 has 3 children and Project 2 has 2 children. Total there are 5 children i.e Department A, Department B and Department C, they are network related children as we said that this model can have more than one parent. So, for the Department B and Department C have two parents i.e. Project 1

3.Object-Oriented Model

- In an object-oriented database, data is organized into objects, which are self-contained entities that contain both data and the methods that operate on that data.
- Object-oriented databases are designed to support the creation and management of complex data structures, and they are often used in applications that require the manipulation of large amounts of structured and semi-structured data.

4.Relational Model

- These are the most widely used type of databases, and they store data in tables that are related to each other through common keys or indexes. Examples of relational databases include MySQL, Oracle, and Microsoft SQL Server.

5.NoSQL Model

- These databases are designed to handle large amounts of unstructured or semi-structured data, and they do not use the traditional table-based relational database model. Instead, they use a variety of data models, such as key-value pairs, documents, and graphs, to store data.
- Examples of NoSQL databases include MongoDB, Cassandra, and Couchbase

6.Centralized Model

- A centralized database is a database that is stored on a central server and can be accessed by multiple users over a network. The central server acts as a hub for the database, and all users access the same copy of the database. This database is commonly used in organizations to store and manage data that is shared by multiple users or departments.
- An example of this is an HR management system where employee data, payroll processes, and login history are all stored in one place for easy access and organization.5

7.Distributed Model

- A distributed database is stored and managed across multiple servers, rather than on a single central server.
- It is designed to provide faster access to data and to improve the scalability and reliability of the database. In a distributed database, data is divided into smaller chunks and stored on multiple servers, with each server responsible for storing and managing a portion of the data.

- Telephone and cellular networks are also examples of distributed networks

8.Cloud MODEL

- A cloud database is stored and managed on a cloud computing platform, rather than on a local server or device. Cloud databases are accessed over the internet and can be used by multiple users or applications, providing a flexible and scalable way to store and manage data.
- Cloud databases can be used for a wide range of applications, including web and mobile applications, data warehousing, and more.

9.Personal Database

- A personal database is designed to store and manage data for a single individual or small group of users.
- They are typically smaller in scale and scope than enterprise databases, which are used by larger organizations to store and manage data for a large number of users.
- You can use personal databases to store and manage a wide range of data, including financial records, contact information, personal notes, and more.

10.Open-Source Databases

- Open-source databases are available for free and can be used, modified, and distributed by anyone.
- Open-source databases are developed and maintained by a community of volunteers, and users are free to access and modify the source code as needed.

Thanks