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B.N: 686

Topic: Database Systems

GitHub Link: https://github.com/MohamedHazem83/ECE001

GitHub Pages: https://mohamedhazem83.github.io/ECE001/

Definition of Database Systems:

A Database management system is a computerized record-keeping system. It is a repository or a container for collection of computerized data files. The overall purpose of DBMS is to allow the users to define, store, retrieve and update the information contained in the database on demand. Information can be anything that is of significance to an individual or organization.

Applications of Database Systems:

It used in Universities For student information, course registrations, colleges and grades.

It used in Telecommunication for helping to keep call records, monthly bills, maintaining balances, etc.

It used in Finance For storing information about stock, sales, and purchases of financial instruments like stocks and bonds.

Source Code:

```
        <ul class="navbar">
            <li> <a href="index.html"> Main Page </a> </li>
            <li> <a href="Network Databases.html"> Network Databases </a> </li>
            <li> <a href="Relational database.html"> Relational Database </a> </li>
            <li> <a href="Graph Databases.html"> Graph Databases </a> </li>
            <li> <a href="Document databases.html"> Document Databases </a> </li>
        </ul>
        <br>
        <h2>Relational database</h2>
        <div>
            A relational database is a collection of data items with pre-defined relationships between them. These items are organized as a set o
        </div>
        <p>
            The relational database was invented in 1970 by E. F. Codd, then a young programmer at IBM. In his paper, "A Relational Model of Data
        </p>

        <img src="relational database.png">
        <div style="margin-left: 40px;">Two simple relational databases</div>
    </body>
</html>
```

```

        <ul>
            <li>Network Databases</li>
            <li>Document databases </li>
            <li>Relational database </li>
            <li>Graph Databases </li>
        </ul>

        <div>
            A database system is such a system which:-
        </div>

        <ol>
            <li>Helps store data</li>
            <li>Helps retrieve data</li>
            <li>Helps modify existing data</li>
            <li>Also helps store it in digital format and avoid pen and paper method</li>
        </ol>

    </body>
</html>
```

```
        <table border="2">
            <caption><i>Difference between Relational Databases and Graph Databases:</i></caption>

            <tr>
                <th>Relational Databases</th>
                <th>Graph Databases</th>
            </tr>
            <tr>
                <td>Tabular form</td>
                <td>Graph form</td>
            </tr>
            <tr>
                <td>Stores highly structured data</td>
                <td>Maintains semi structured data</td>
            </tr>
            <tr>
                <td>Depends on key constraints</td>
                <td>Relationship are first-class citizens of the Graph Database model - Constraints can be represented using relationships</td>
            </tr>
            <tr>
                <td>Data is normalized, meaning lots of joins, affecting speed</td>
                <td>Better Performance</td>
            </tr>
            <tr>
                <td>Expensive with join operations</td>
                <td>Eliminates the need for an expensive search / match computation</td>
            </tr>
            <tr>
                <td>Does not scale out horizontally</td>
                <td>High scalability</td>
            </tr>
```

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        <br>
        <h2>Document databases</h2>
        <p>
            A document database is a type of nonrelational database that is designed to store and query data as JSON-like documents. Document dat
        </p>
        <P>
            A document database is a great choice for content management applications such as blogs and video platforms. With a document database
        </P>
        <br>
        <img src="9-document-oriented-databases-4-638.jpg">
        <img src="9-document-oriented-databases-12-638.jpg">
    </body>
</html>
```

Screenshots:

Main Page | Network Databases | Graph Databases | Document databases | Relational database

About Database Systems

The database management system (DBMS) is the software that interacts with end users, applications, and the database itself to capture and analyze the data. The DBMS software additionally encompasses the core facilities provided to administer the database. The sum total of the database, the DBMS and the associated applications can be referred to as a "database system". Often the term "database" is also used to loosely refer to any of the DBMS, the database system or an application associated with the database.
DBMS also provides protection and security to the databases. It also maintains data consistency in case of multiple users.

Here are some examples of popular DBMS used these days:

- Network Databases
- Document databases
- Relational database
- Graph Databases

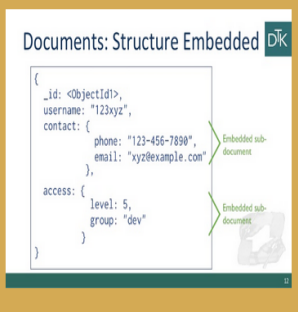
A database system is such a system which:-

1. Helps store data
2. Helps retrieve data
3. Helps modify existing data
4. Also helps store it in digital format and avoid pen and paper method

Document databases

A document database is a type of nonrelational database that is designed to store and query data as JSON-like documents. Document databases make it easier for developers to store and query data in a database by using the same document-model format they use in their application code. The flexible, semistructured, and hierarchical nature of documents and document databases allows them to evolve with applications' needs. The document model works well with use cases such as catalogs, user profiles, and content management systems where each document is unique and evolves over time. Document databases enable flexible indexing, powerful ad hoc queries, and analytics over collections of documents.

A document database is a great choice for content management applications such as blogs and video platforms. With a document database, each entity that the application tracks can be stored as a single document. The document database is more intuitive for a developer to update an application as the requirements evolve. In addition, if the data model needs to change, only the affected documents need to be updated. No schema update is required and no database downtime is necessary to make the changes.



Difference between Relational Databases and Graph Databases:

Relational Databases	Graph Databases
Tabular form	Graph form
Stores highly structured data	Maintains semi structured data
Depends on key constraints	Relationship are first-class citizens of the Graph Database model – Constraints can be represented using relationships
Data is normalized, meaning lots of joins, affecting speed	Better Performance
Expensive with join operations	Eliminates the need for an expensive search / match computation
Does not scale out horizontally	High scalability

References

https://www.quora.com/What-is-database-system

https://www.guru99.com/what-is-dbms.html

https://www.includehelp.com/dbms/types-of-database-management-system.aspx

https://www.tutorialspoint.com/Types-of-databases

https://codebots.com/continuous-modernisation/types-of-databases-and-dbms-with-examples