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DATABASES DIFFERENCE BETWEEN

# Relational Database vs Flat File (Differences & Similarities)



This article provides an overview of the differences and similarities between relational databases and flat files. See the comparison on the basis of different criteria like structure, data integrity, data model, data access, performance and scalability.

## What is a Relational Database?

A relational database is a type of database that stores and organizes data in a collection of tables. These tables are related to each other through the use of a common field known as a primary key. Relational databases are used to store, organize and retrieve data quickly and efficiently. They are the most common type of database used in business applications.

## What is Flat File Database?

A flat file, also known as a text database, stores data in plain text format and is organized as a single table with no relationships between tables. This type of database was first developed and implemented by IBM in the early 1970s.

## Difference Between Relational Database vs Flat File

A relational database and a flat file are both types of data storage, but they have some key differences:

### Structure:

A relational database is a type of database that organizes data into one or more tables, with each table consisting of a set of rows and columns. Each table has a unique key that can be used to establish relationships with other tables. A flat file, on the other hand, is a simple file that contains a single table of data, with no relationships between tables.

### Data Integrity:

Relational databases enforce data integrity through the use of primary and foreign keys, which ensures that data is stored in a

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Data Model:

Relational databases use a relational data model, which is based on the mathematical concept of a relation. It is a high-level data model that provides a way to organize and manage data in a logical and consistent way. Flat files use a flat data model, which is a simple data model that stores data in a single table with no relationships.

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Data Access:

Relational databases provide a variety of data access methods, including SQL, which allows for complex queries and data manipulation. Flat files can only be accessed and manipulated through simple file I/O operations.

Performance:

Relational databases are optimized for performance, with indexes, caching and other techniques to improve query speed. Flat files, on the other hand, can be slow when dealing with large datasets and complex queries.

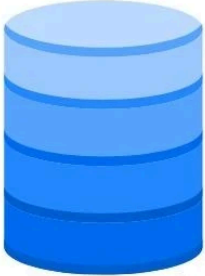
Scalability:

Relational databases can handle large amounts of data and handle the concurrent access from multiple users. Flat files are not designed to handle large amounts of data and are not well-suited for concurrent access.

See the difference in table format (infographic)



# Relational Database



# VS



# Flat File



| Relational Database                                                                                                                                                                                                                          | Flat File                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| A relational database is a type of database that organizes data into one or more tables, with each table consisting of a set of rows and columns. Each table has a unique key that can be used to establish relationships with other tables. | A flat file, on the other hand, is a simple file that contains a single table of data, with no relationships between tables. |
| Relational databases enforce data integrity through the use of primary and foreign keys, which ensures that data is stored in a consistent and accurate format.                                                                              | Flat files do not have any built-in mechanism for enforcing data integrity.                                                  |
| Relational databases use a relational data model, which is based on the mathematical concept of a relation. It is a high-level data model that provides a way to organize and manage data in a                                               | Flat files use a flat data model, which is a simple data model that stores data in a single table with no relationships.     |

|                                                                                                                                       |                                                                                                            |
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Relational Database vs Flat File

Relational databases are more powerful and flexible than flat files, providing more advanced data management capabilities, better performance, scalability, and security. Flat files are a simple, lightweight and easy to use data storage method, but they are not designed to handle complex data management tasks.

## Similarities Between Relational Database vs Flat File

While there are many differences between relational databases and flat files, there are also some similarities:

1. **Data storage:** Both relational databases and flat files are used for storing data.
2. **Data organization:** Both relational databases and flat files organize data into tables.
3. **Data retrieval:** Both relational databases and flat files can be used to retrieve data.
4. **Compatibility:** Both relational databases and flat files can be used with a variety of programming languages and platforms.
5. **Data Backup:** Both Relational databases and flat files can be backed up and restored.

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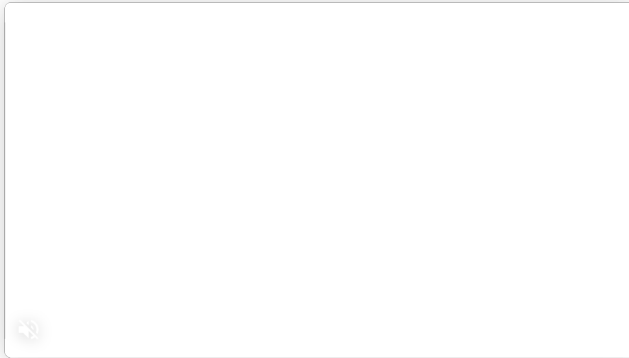


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In summary, both relational databases and flat files are used to store, retrieve and organize data, both are file-based storage and can be used with a variety of platforms and programming languages and both have backup and restore capabilities. However, relational databases are more powerful, flexible, and efficient than flat files, providing advanced data management capabilities, better performance, scalability, and security.

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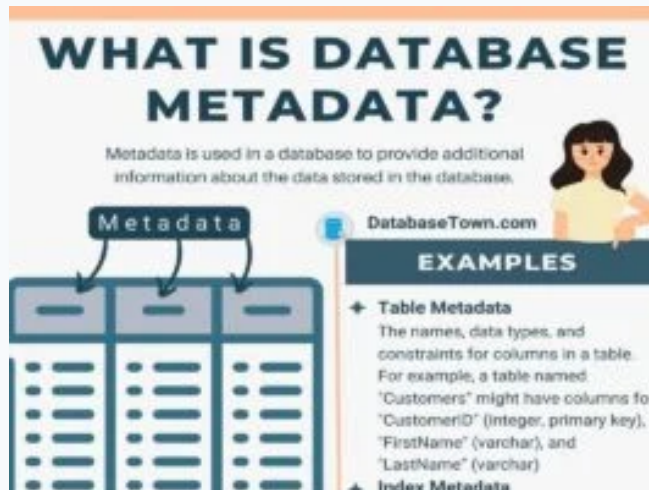


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