Manish Jaiswal

SQL Interview Question

MASTERING

SQL Indexing Essentials

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01

Introduction to Indexes

What's an Index?

In SQL, an index is a data structure that helps speed up data retrieval without scanning the entire table. Think of it like a book's index, directing you to exactly where the info is, saving you time!

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Why Use Indexes?

Indexes boost query performance by making data searches much faster. However, they come at the cost of additional storage and slower write operations (like inserts, updates, and deletes).

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Clustered Index

What is a Clustered Index?

A clustered index is applied on the primary key by default and defines the table's physical storage order.

- Example: Sorting customer orders by OrderID for easy sequential access.

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Non-clustered Index

What is a Non-clustered Index?

A non-clustered index is an index structure separate from the main table, like a "pointer." It’s ideal for columns frequently used in searches.

- Example: A non-clustered index on CustomerName for quick lookups by name.

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Clustered vs. Non-clustered Index

- **Clustered Index:** Reorders the actual data in the table, physically sorting it by the indexed column.
- **Non-clustered Index:** Creates a separate structure, pointing to the data rows, without changing the physical order.

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Industry Example

Example Scenario 📋

Imagine an e-commerce database:

1. **Clustered Index** on OrderID - retrieves recent orders quickly.
2. **Non-clustered Index** on CustomerName - enables quick customer lookups without scanning the whole table.

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Performance Tips

- Indexes speed up reads but slow down writes.
- Too many indexes = slower inserts/updates.
- Regularly review and drop unused indexes for optimized performance.

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