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SQL vs NoSQL Databases: Question and Answer.

Q1: What is SQL and why is it powerful?

SQL (Structured Query Language) is a versatile and widely-used language for defining and manipulating data in databases. It is great for executing complex queries and joins.

Q2: What is a limitation of SQL databases?

SQL databases require predefined schemas to structure data, which can be restrictive. All data must conform to this structure, necessitating significant upfront preparation and making structural changes difficult and disruptive.

Q3: How are SQL databases typically scaled?

SQL databases are vertically scalable, meaning you increase the capacity of a single server by adding resources like CPU, RAM, or SSD.

Q4: What type of structure do SQL databases use?

SQL databases are table-based, making them ideal for applications requiring multi-row transactions, such as accounting systems or legacy applications.

Q5: What are some examples of SQL databases?

Examples include MySQL, Oracle, PostgreSQL, and Microsoft SQL Server.

Q6: What is NoSQL and what flexibility does it offer?

NoSQL databases use dynamic schemas for unstructured data. They allow creating documents without a predefined structure, where each document can have a unique schema.

Q7: How can data be stored in NoSQL databases?

NoSQL databases store data in various forms, such as column-oriented, document-oriented, graph-based, or key-value stores.

Q8: How are NoSQL databases typically scaled?

NoSQL databases are horizontally scalable, enabling more traffic to be handled by adding servers (sharding).

Q9: What type of structure do NoSQL databases use?

NoSQL databases can be document-based, key-value pairs, graph databases, or wide-column stores.

Q10: What are some examples of NoSQL databases?

Examples include MongoDB, BigTable, Redis, RavenDB, Cassandra, HBase, Neo4j, and CouchDB.

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Q11: What are the key strengths of MySQL as a relational database?

- **Maturity:** Established with extensive testing and community support.
- **Compatibility:** Available across major platforms and supports multiple programming languages.
- **Cost-effective:** Open source and free.
- **Replicable:** Supports replication to reduce workloads and enhance scalability.
- **Sharding:** Supports sharding, making it cost-effective for scalability.

Q12: Why is MySQL suitable for relational databases?

It is table-based and excels in structured, multi-row transactions.

Q13: What are the key strengths of MongoDB as a non-relational database?

- **Dynamic Schema:** Allows flexible changes without affecting existing data.
- **Scalability:** Horizontally scalable, reducing workloads and enabling business growth.
- **Manageability:** Does not require a dedicated database administrator.
- **Speed:** High performance for simple queries.
- **Flexibility:** Enables adding new fields without impacting existing rows or performance.

Q14: Why is MongoDB suitable for NoSQL databases?

It supports dynamic schema and is optimized for unstructured and flexible data storage.

Let me know if this format meets your needs or if further adjustments are required!

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