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TΠΠ

SQL vs. NOSQL Databases

Which one to chose and why?

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Outline

ПШ
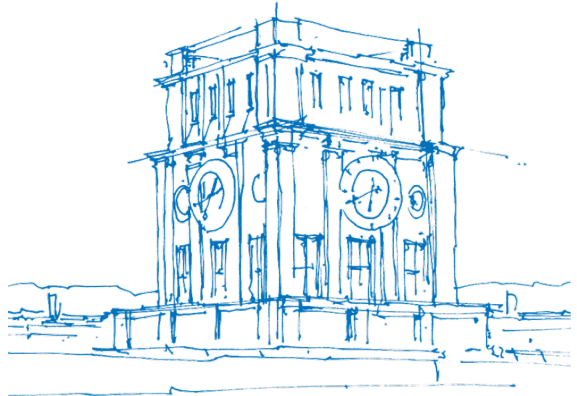
1 SQL Databases

2 NOSQL Databases

SQL Databases
What are they?

- SQL = Structured Query Language
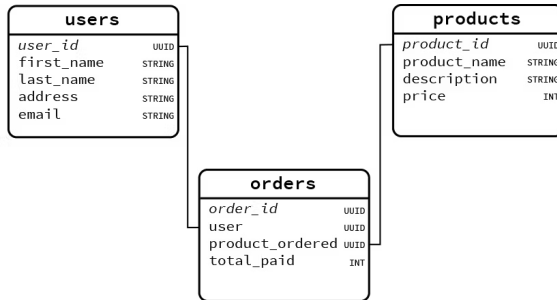- SQL DB's are table based
- Are relational Databases

users	
user_id	UUID
first_name	STRING
last_name	STRING
address	STRING
email	STRING

products	
product_id	UUID
product_name	STRING
description	STRING
price	INT

orders	
order_id	UUID
user	UUID
product_ordered	UUID
total_paid	INT

Figure 1 SQL DB example

Pros and Cons of SQL DB's

Pros	Cons
Great for structured data	Schema definition overhead
Data integrity through relationships	Scalability challenges
Standardized language (SQL)	Steeper learning curve
ACID compliance for transactions	Limited flexibility

Outline

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NOSQL Databases
What are they?

- NOSQL DB's are document/ Key Value/ Graph or wide column storage based
- Data is stored in documents as key/value pair
- Supports data sharding (Distributed DB)

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Pros and Cons of NOSQL DB's

Pros	Cons
Flexible data model	Low reliability
Store huge amount of data with little to no structure	Verifying data integrity and consistency is challenging
High performance	Limited querry flexibility
Less code and easy maintenance	Can lead to inconsistent states due to delayed updates (Eventual consistency

Our use case

■ In our use case, we are interested in the following:

- ☐ Storing huge amount of data.
- ☐ High selectivity querying of data points/ intervals
- ☐ Data will be pre-curated and ready for use
- ☐ Data already presents a minimal structure (In the form of columns for features and rows for observations)
- ☐ Datasets will more likely be independant from one another.

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Comparison

In the context of our use case, a careful evaluation of the strengths and weaknesses of both SQL and NoSQL databases leads me to favor the use of a NoSQL database. Two major factors support this preference:

1. **Volume of Stored Data:** Given the substantial amount of data to be stored, the flexibility and scalability offered by NoSQL databases are advantageous.
2. **Dynamic Data Structure:** NoSQL's ability to handle unstructured or evolving data without a predefined schema aligns well with our requirement for a database that accommodates new data without constraints.

This strategic choice addresses the specific needs of our use case, emphasizing adaptability and scalability.

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Thank you for your attention!

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