NoSQL

- NOSQL (not only SQL) are non-tabular databases and store data differently than relational tables.
- NOSQL databases come in a variety of types based on their data model. like document, key-value, wide-column and graph.
- Some features are given below:-

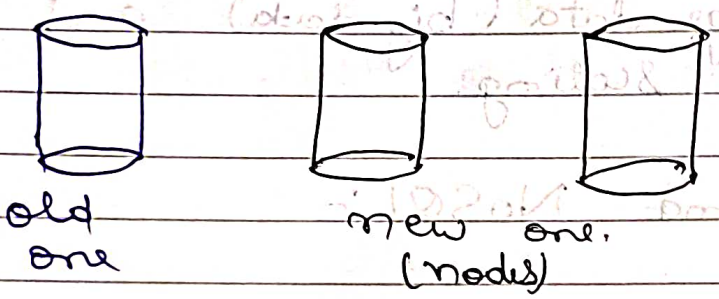
1. They are schema free.
2. They are not tabular, they are more flexible, has the ability to adust dynamically.
3. Can handle huge data (big data) and capable of horizontal scaling.

- History Behind NoSQL:-
- NoSQL emerged in 2000s as the cost of storage decreases, now developers focus more on faster execution than the space or storage constraints.
- Their main focus to faster retrieval of data and not reducing redundancy.
- NoSQL stores huge amount of data and they are capable of doing horizontal scaling that is scale out instead of

Vertical Scaling that is Scale up.

- In MySQL we do Vertical Scaling i.e., if the memory will get filled we increased the Hardware, RAM, CPU of that memory space.

- In NoSQL we do horizontal Scaling i.e, if the memory will get filled we make more memory space by adding nodes.



- We can't do horizontal Scaling in MySQL as it is stored in table collection form and retrieval of data is done by JOINS. So, the new nodes may be possible are present in different places and are connect via internet. The process of retrieval causes a lot of delay in data.

- Scaling horizontally is achieved through Sharding or Replica-Sets.
- NoSQL is fault tolerence as data is stored at multiple servers.
- Queries in NoSQL is faster than SQL as SQL databases is typically normalised, so query for a single object requires join data from multiple tables.
- Caching mechanism use and NoSQL is mostly used for cloud applications.
- NoSQL database even store the relationship data in different way than the MySQL.
- Some NoSQL language MongoDB, Supports ACID properties too.
- ~~Types of NoSQL~~

① Key-Value Stores :-

- Simplest form, stores data as key-value pairs (like a dictionary).
- Ideal for shopping carts, user-profile, real-time access..
- E.g. ⇒ Amazon Dynamo DB, Oracle NoSQL.

② Column-Oriented Stores

- Stores data in columns, making analytics faster.
- Ideal for analytics.
- E.g. ⇒ Cassandra, RedShift.

③ Document-Based Stores

- Stores data in document format (similar to JSON).
- Ideal for: e-commerce, mobile apps, transactions.
- E.g. ⇒ MongoDB, CouchDB.

④ Graph-Based Stores:

- Focuses on relationships between data elements (nodes & links).
- Ideal for: fraud detection, social network, knowledge graphs.
- Eg. ⇒ Neo4j.

- NoSQL databases Dis-advantages

① Data Redundancy :- Since NoSQL databases are typically optimised for queries and not for reducing data duplication.

② Update & Delete operations are costly.

③ All NoSQL language does not support ACID.