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ASSIGNMENT 1

Aim : Study and compare with suitable example various NOSQL database systems

Problem Statement : Study and design a database with suitable example using following database systems
- Relational : SQL / PostgreSQL / MySQL
- Key value : Riak / Redis
- Columnar : Hbase
- Document : MongoDB / CouchDB
- Graph : Neo4J

Objective :
- To study different types of NoSQL databases
- To study advantages of various NoSQL databases
- To study difference in NoSQL and RDBMS
- To compare different databases

Theory :
- Database - stores collection of data
- DBMS - software system that enables users to define, create maintain & control access to database

Relational Databases :-

i) **SQL** - Structured Query Language is used to communicate with database. SQL commands such as select, insert, update, delete, create and drop can be used.

ii) **PostGreSQL** - Object Relational Database Management System (ORDBMS). It is ACID compliant and transactional

iii) **MySQL** - It is open source DBMS. It is a central component

of LAMP open-source web application software stack.

Key Value :-

i) Riak - Distributed NoSQL key-value datastore that offers availablity, fault tolerance, operational simplicity and scalablity

ii) Redis - In memory database open source software project implementing a networked, in-memory, key value store with operational durablity.

Columnar :-

i) Hbase - An open source, non relational distributed database modelled after Google's bigtable and is written in JAVA. It is developed as a part of Apache Software Foundation's Apache Hadoop project.

Doument :-

i) MongoDB - It is free and open source cross platform doument oriented database program. It uses JSON like douments with schemas

ii) CouchDB - Apache CouchDB is open source database software that focuses on ease of use and it uses JSON to store data.

Graph :-

i) Neo4J - It is graph management system developed by Neo Technology. It is most popular graph database according to db.engines.com

Difference between RDBMS and NoSQL :

	RDBMS	NoSQL
1)	Primarily called as RDBMS or relational database	1) It is non-relational or distributed database
2)	These are table based	2) They can be document based, key-value pairs, graph databases
3)	Vertically scalable	3) Horizontally scalable
4)	Have predefined schema	4) Use dynamic schema for unstructured data
5)	Requires specialized DB hardware for better performance.	5) Uses commodity hardware
6)	Structured Query Language	6) No declarative Query Language
7)	Ideal choice for complex queries.	7) Not a good fit for complex queries.
8)	ACID	8) BASE
9)	Examples – MySQL, Microsoft SQL server, etc.	9) Examples – MongoDB, Redis, NEO4J, etc.

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Conclusion :

1) I studied various open source RDBMS and NoSQL database systems
2) Also compared basic RDBMS and NoSQL database systems based on their efficiency, scalability, characteristics and performance