



پوهنتون کاردان
KARDAN UNIVERSITY

Database Administration

MongoDB



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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ
وَالصَّلَاةُ وَالسَّلَامُ عَلَى سَيِّدِنَا مُحَمَّدٍ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ



MongoDB

Understanding NoSQL, Key Concepts, and Differences from RDBMS



What is MongoDB?

- - A NoSQL database designed for flexibility, scalability, and high performance
- - Stores data in JSON-like documents
- - Developed by MongoDB Inc., first released in 2009
- - Suitable for big data, real-time analytics, and dynamic schemas



Why Use MongoDB?

- - Schema-less (document structure can vary)
- - Designed for horizontal scalability
- - Integrated support for aggregation
- - Great for agile (start) development
 - *As agile focuses on delivering working software in short cycles, allowing for frequent feedback and adaptation to changing requirements. This contrasts with traditional methods that often involve extensive pre-requisite planning and less flexibility. MongoDB accept the data before any earlier design.*



MongoDB vs RDBMS – Core Differences

Feature	MongoDB (NoSQL)	RDBMS (SQL-based)
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Data Storage	Documents (JSON)	Tables(rows/columns)
Schema	Dynamic (schema-less)	Fixed schema
Joins	Not native, manual refs	Supports joins
Scalability	Horizontal	Vertical (scale-up)
Transactions	Limited (multi-doc)	Full ACID
Language	MQL(MDB Qu Language)	SQL



Key Concepts in MongoDB

- - Database → container for collections
- - Collection → like a table, holds documents
- - Document → key-value pairs in JSON format
- - Field → key in a document
- - Index → improves search performance
- - Primary Key → `_id` field is unique for each document



JSON

- - BSON = Binary JSON
- - JSON (Java Script Object Notation)

Both applicable for efficiently storing the data and focus on speed. The BSON keep the data values with consideration of there data types.



CRUD Operations in MongoDB

- - Create → insertOne(), insertMany()
- - Read/Select → find(), findOne()
- - Update → updateOne(), updateMany()
- - Delete → deleteOne(), deleteMany()



Use Cases for MongoDB

- - Content management systems
- - IoT and sensor data
- - Product catalogs
- - Real-time analytics dashboards
- - Mobile apps with flexible data models



Summary

- - MongoDB is a flexible, scalable NoSQL database
- - Ideal for modern applications with dynamic schemas
- - Key differences from RDBMS (Relational) lie in data model (NoSQL), schema-less, and scalability
- - Understanding MongoDB's core concepts is essential before implementation



Surprise

DBA QUIZ NO: 02



Name:_____ Reg#_____ DBA Mon Eve

Attempt the given questions

1. When would you choose MongoDB over a relational database?
2. What challenges might arise when switching from RDBMS to MongoDB?





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Thank You