

A short MongoDB Tutorial

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What is MongoDB?

- NoSQL Database
 - document-oriented database
- Name derived from the word *humongous*
- Rather drastic shift from relational databases
 - no schemas, joins, foreign keys, ...
- A good way to store large amounts of data

Why MongoDB?

- Simple
 - setup (at least for single instances)
 - usage
- Flexible
 - requires no fixed schema
- Fast
 - writing speeds compared to relational databases
- Feature rich
 - e.g. data aggregation
- Horizontal scalable
 - creating a cluster
- Free and Open Source
 - Community Version
 - MongoDB Enterprise is really expensive
 - MongoDB Atlas is a hosted and affordable enterprise version

NoSQL

- Weaker emphasis on data consistency compared to relational databases
 - for uses-cases where consistent data is not that important
 - but faster because of this
- Less rigid than relational databases
 - does not need a strict schema
 - flexible and easily adaptable to new data
- Gained traction in the late 2000s
 - around the same time Social Media got big
- Different flavours
 - document-oriented database
 - wide-column store
 - graph databases (?)

What is MongoDB good at?

- Writing values into the database
 - quite fast doing so
 - not as fast as Cassandra though
- Dealing with large amounts of (semi-structured) data
 - think of MongoDB as a huge JSON file
- Being flexible
 - documents in a collection do not need to have the same data model
 - data structure can change over time ➡ better equipped for the future
- Adoption
 - every major programming language has MongoDB bindings

What is MongoDB not so good at?

- Finding data
 - especially searching by values
 - indices help though
- Updating data
 - because you have to find data first
- Data consistency
 - keep track of it yourself ➡ prone to errors

MongoDB for Time Series Data

- MongoDB is well suited for time series data
- Bucketing
 - splitting data into different buckets
- Native aggregation features
- MongoDB 5.0 added native time series support

Hands-on

Show, don't tell: https://mongoplayground.net/p/o7W_XoBqZzi

Check repo for test data and sample queries

<https://github.com/complexity-science-hub/skillup/tree/master/mongodb>