بسم الله

# MongoDB

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# contents

- SQL vs NoSQL
- MongoDB vs PostgreSQL
- Terminology
- How to create and drop database / collection?
- How to insert some simple data and see them?

# SQL vs NoSQL

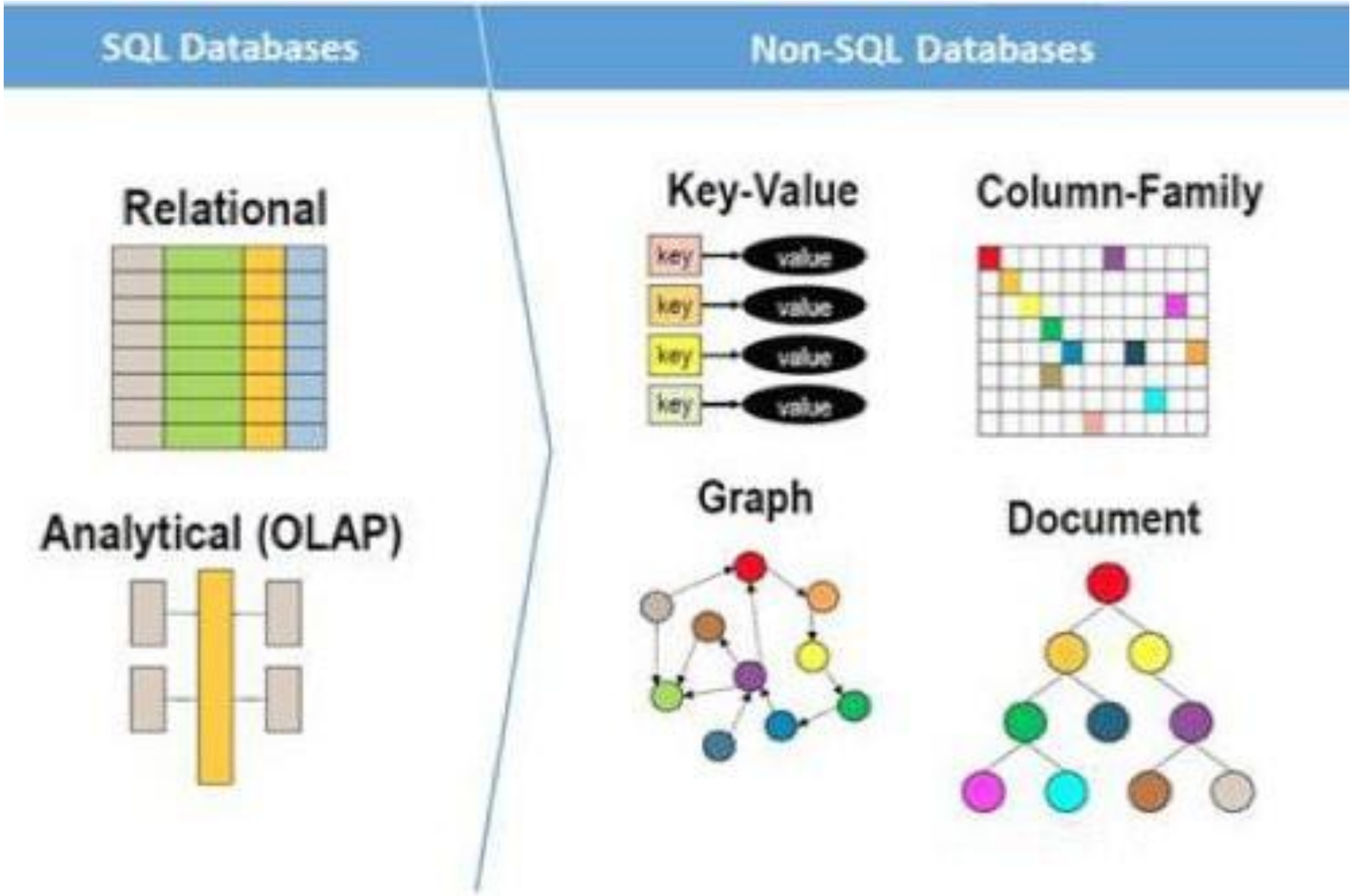
# Examples

- SQL
  - MySQL
  - Oracle
  - PostgreSQL
  - Microsoft SQL Server

- NoSQL
  - MongoDB
  - Google BigTable
  - Redis
  - RavenDB
  - Facebook’s Cassandra
  - Apache Hbase
  - Neo4j
  - CouchDB

# Structure

- SQL databases are relational
- NoSQL are non-relational


SQL Databases
Non-SQL Databases
Relational
Analytical (OLAP)
Key-Value
key
value
Column-Family
Graph
Document

# Language

- SQL databases use structured query language and have a predefined schema
- NoSQL databases have dynamic schemas for unstructured data.

- SQL: a town where everyone speaks the same language
- NoSQL: where every home can speak a different language.

# Language – cont.

- SQL: structured query language
  - Safe for complex queries
  - requires  predefined schemas
- NoSQL:
  - You can create documents without having to first define their structure
  - Each document can have its own unique structure
  - The syntax can vary from database to database
  - You can add fields as you go

# Scalability

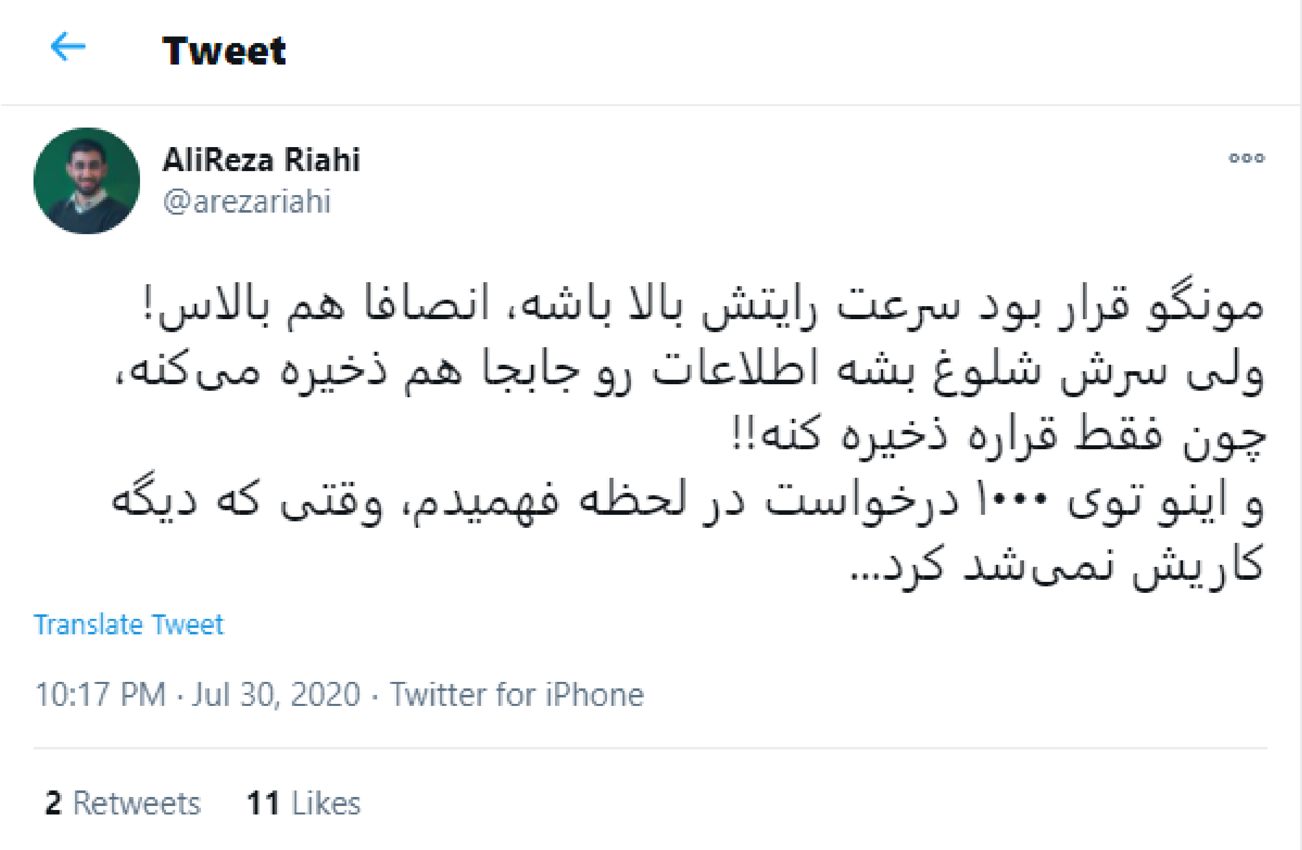
- SQL databases are vertically scalable
  - by increasing things like CPU, RAM or SSD
  - It’s like adding more buildings to the neighborhood
- NoSQL databases are horizontally scalable.
  - handle more traffic by sharding, or adding more servers in your NoSQL database
  - It’s like adding more floors to the same building

# MongoDB vs PostgreSQL

- When to use MongoDB?
  - Schema evolves as your application evolves
  - Horizontal scaling means that MongoDB is fast
  - ACID (Atomicity, Consistency, Isolation, Durability) is not a priority

# MongoDB vs PostgreSQL

- When to use PostgreSQL?
  - Data depends on reliability of ACID
  - Schemas have an identified relationship
  - Downtime to upgrade isn’t a drawback

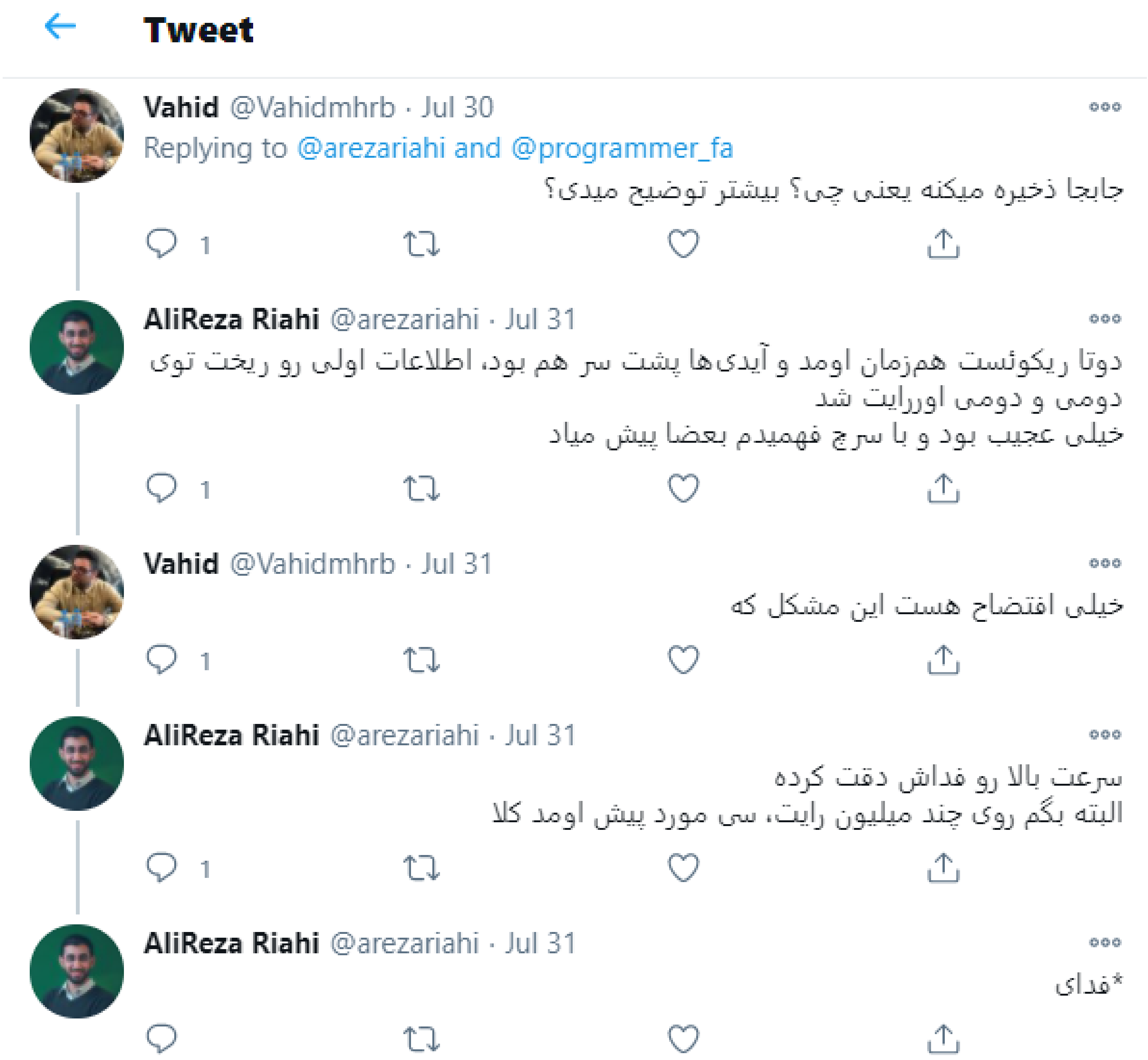


AliReza Riahi
@arezariahi

مونگو قرار بود سرعت رایتش بالا باشه، انصافا هم بالاس!
ولی سرش شلوغ بشه اطلاعات رو جابجا هم ذخیره می‌کنه،
چون فقط قراره ذخیره کنه!!
و اینو توی ۱۰۰۰ درخواست در لحظه فهمیدم، وقتی که دیگه
کاریش نمی‌شد کرد...

10:17 PM · Jul 30, 2020 · Twitter for iPhone

2 Retweets 11 Likes



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Replying to @arezariahi and @programmer_fa

جابجا ذخیره میکنه یعنی چی؟ بیشتر توضیح میدی؟

**AliReza Riahi** @arezariahi · Jul 31

دوتا ریکوئست همزمان اومد و آیدی‌ها پشت سر هم بود، اطلاعات اولی رو ریخت توی دومی و دومی اوررایت شد
خیلی عجیب بود و با سرچ فهمیدم بعضا پیش میاد

**Vahid** @Vahidmhrb · Jul 31

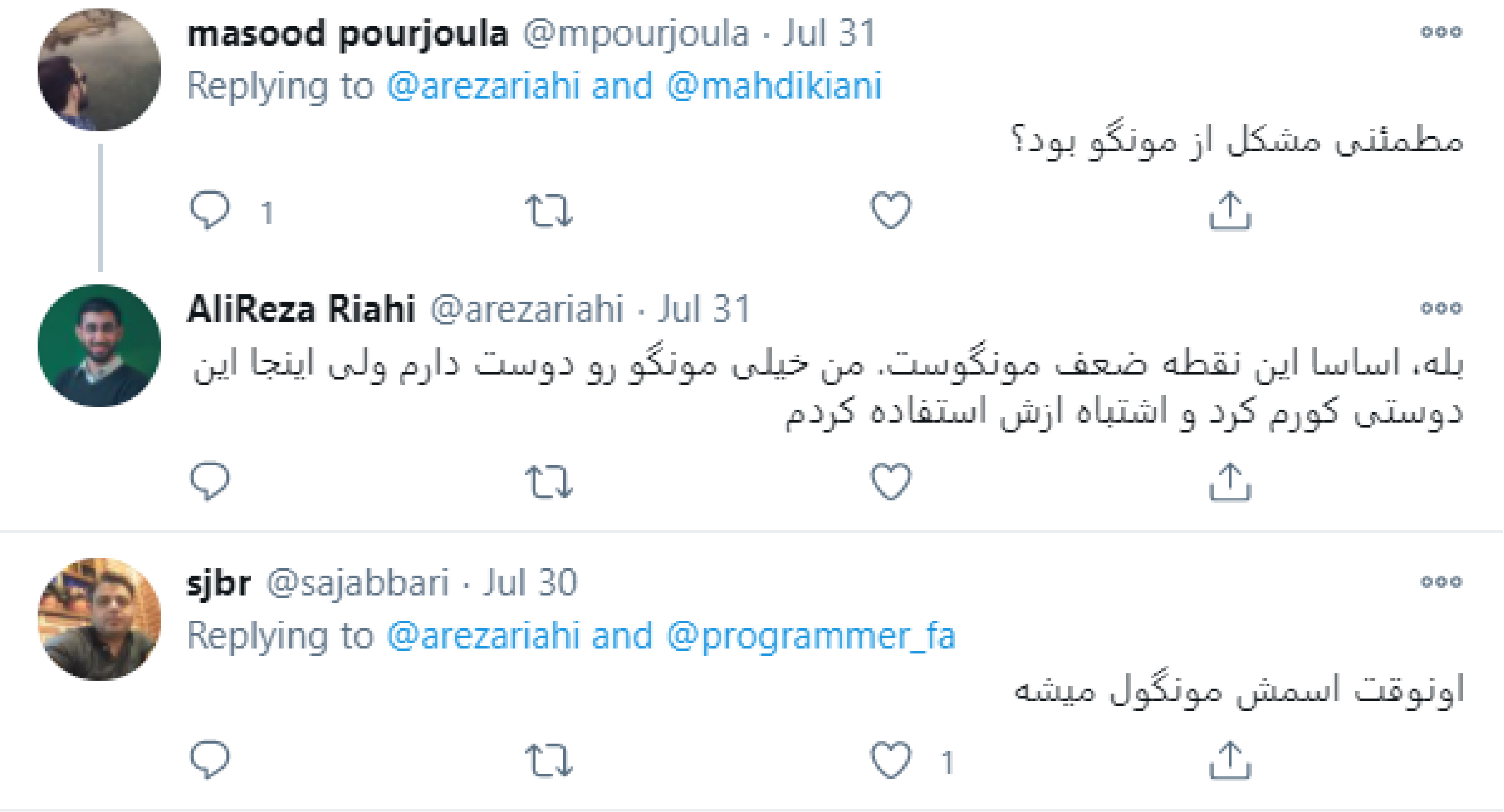
خیلی افتضاح هست این مشکل که

**AliReza Riahi** @arezariahi · Jul 31

سرعت بالا رو فداش دقت کرده
البته بگم روی چند میلیون رایت، سی مورد پیش اومد کلا

**AliReza Riahi** @arezariahi · Jul 31

*فدای



**masood pourjoula** @mpourjoula · Jul 31

Replying to @arezariahi and @mahdikiani

مطمئنی مشکل از مونگو بود؟

**AliReza Riahi** @arezariahi · Jul 31

بله، اساسا این نقطه ضعف مونگوست. من خیلی مونگو رو دوست دارم ولی اینجا این دوستی کورم کرد و اشتباه ازش استفاده کردم

**sjbr** @sajabbari · Jul 30

Replying to @arezariahi and @programmer_fa

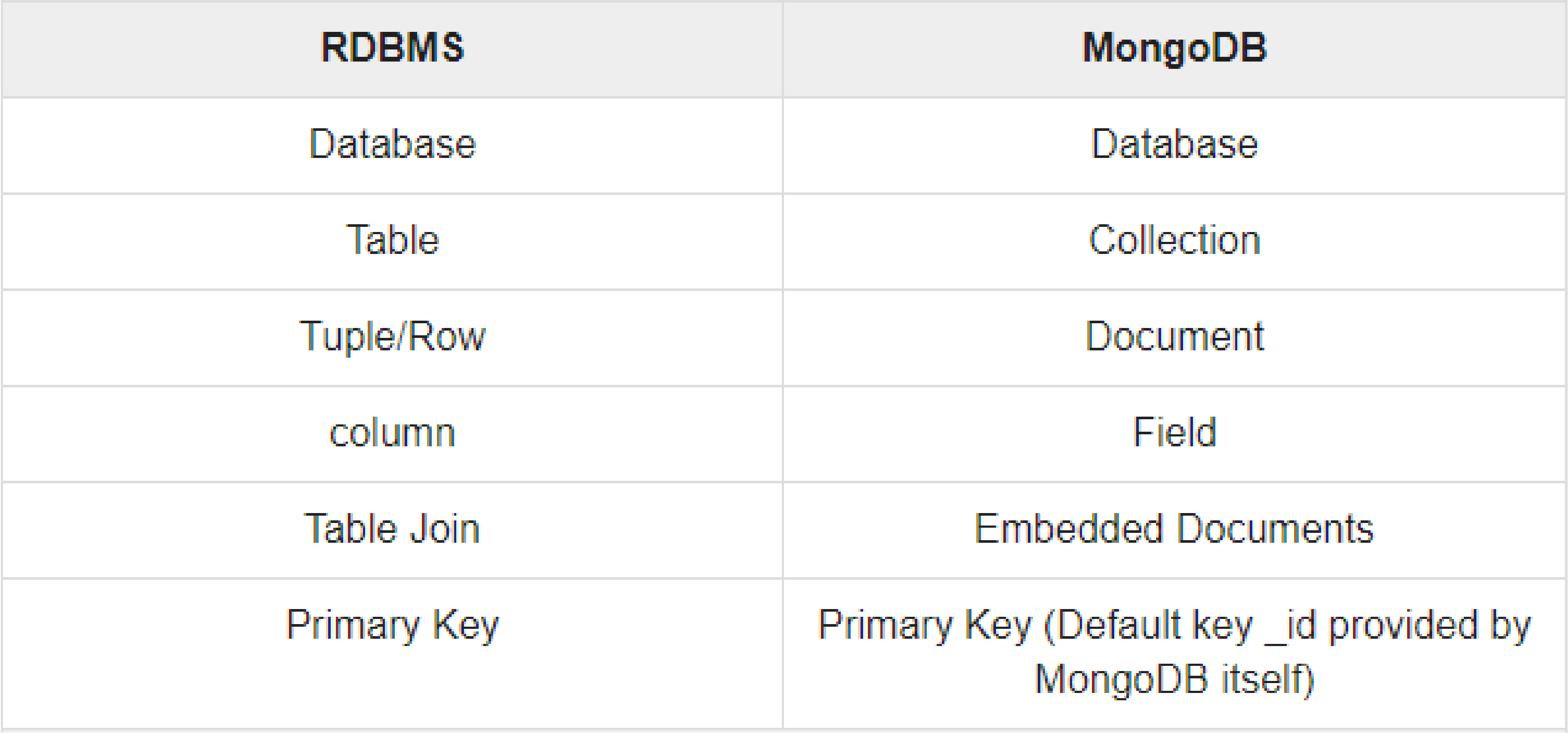
اونوقت اسمش مونگول میشه

# MongoDB

# Overview

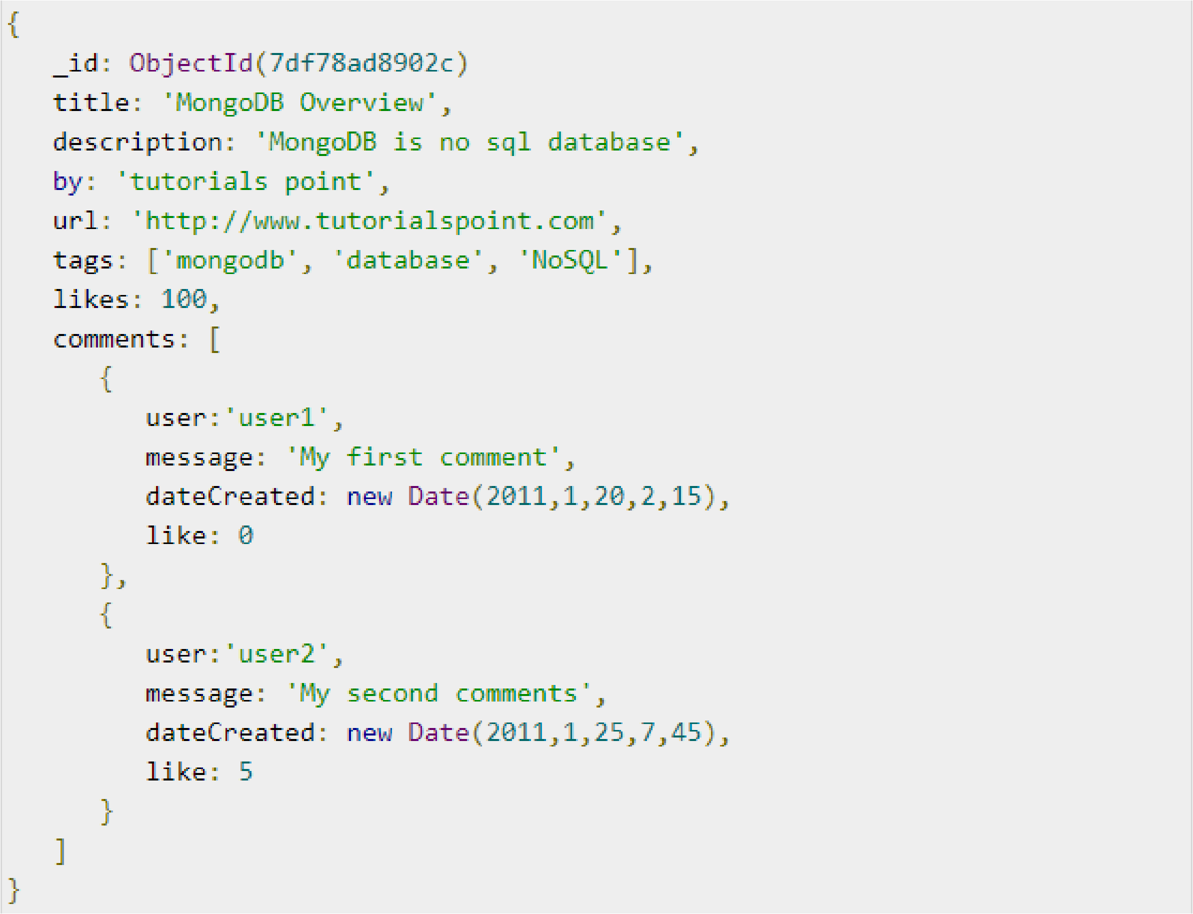
- Database: physical container for collections
- Collection: a group of MongoDB documents. equivalent of an RDBMS table
- Document: a set of key-value pairs. Documents have dynamic schema.

# Terminology



| RDBMS | MongoDB |
|---|---|
| Database | Database |
| Table | Collection |
| Tuple/Row | Document |
| column | Field |
| Table Join | Embedded Documents |
| Primary Key | Primary Key (Default key _id provided by MongoDB itself) |

# Sample Document



```
{
   _id: ObjectId(7df78ad8902c)
   title: 'MongoDB Overview',
   description: 'MongoDB is no sql database',
   by: 'tutorials point',
   url: 'http://www.tutorialspoint.com',
   tags: ['mongodb', 'database', 'NoSQL'],
   likes: 100,
   comments: [
      {
         user:'user1',
         message: 'My first comment',
         dateCreated: new Date(2011,1,20,2,15),
         like: 0
      },
      {
         user:'user2',
         message: 'My second comments',
         dateCreated: new Date(2011,1,25,7,45),
         like: 5
      }
   ]
}
```

# Primary Key

- _id : a 12 bytes hexadecimal number
- assures the uniqueness of every document

# Create Database

- To open MongoDB shell:

```
$ mongo
```

- To create database:

```
> use mydb
```

- To check your currently selected database:

```
> db
mydb
```

- to check your databases list:

```
>show dbs
local 0.78125GB
test 0.23012GB
```

# Create Database – cont.

- Your created database (mydb) is not present in list
- you need to insert at least one document:

```
>db.movie.insert({"name":"tutorials point"})
>show dbs
local 0.78125GB
mydb 0.23012GB
test 0.23012GB
```

# Drop Database

- First use the database then drop it

```
>use mydb
switched to db mydb

>db.dropDatabase()
>{ "dropped" : "mydb", "ok" : 1 }

>
```

# Collection

- If you want to set options for the collection:

```
db.createCollection(name, options)
```

- Options: for example fixed-size collection (refer to references)
- To check the created collections:

```
show collections
```

# Collection – cont.

- But you don't need to create collection. MongoDB creates collection automatically, when you insert some document

```
>db.tutorialspoint.insert(
{"name" : "tutorialspoint"}), WriteResult({ "nInserted" : 1 }
)
```

- To drop collection:

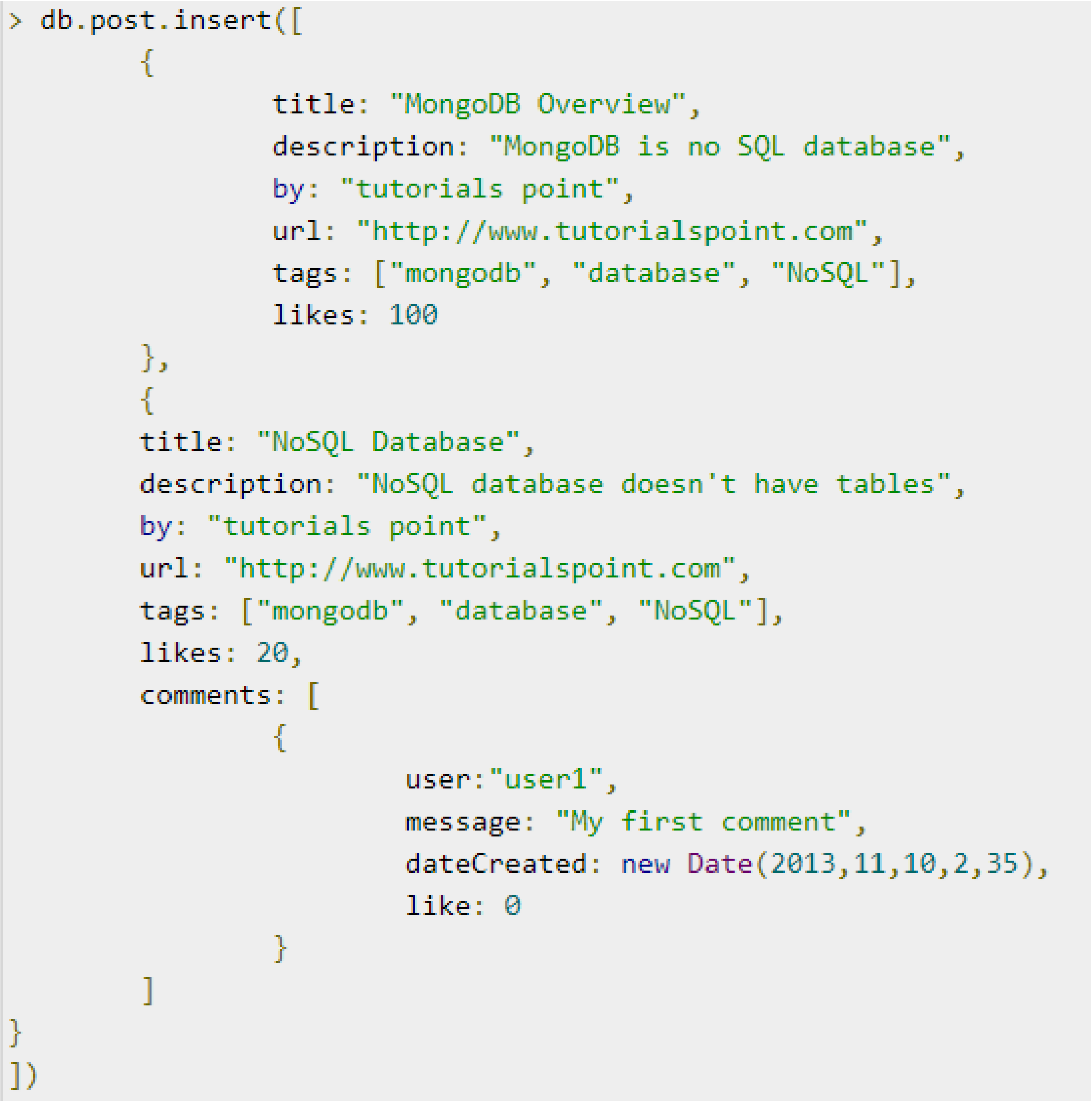
```
db.COLLECTION_NAME.drop()
```

# Insert Document

```
> db.users.insert({
... _id : ObjectId("507f191e810c19729de860ea"),
... title: "MongoDB Overview",
... description: "MongoDB is no sql database",
... by: "tutorials point",
... url: "http://www.tutorialspoint.com",
... tags: ['mongodb', 'database', 'NoSQL’],
... likes: 100
... })
WriteResult({ "nInserted" : 1 })
>
```

- if we don't specify the _id parameter, then MongoDB assigns a unique ObjectId

Also could pass an array of documents into insert()



```
> db.post.insert([
        {
                title: "MongoDB Overview",
                description: "MongoDB is no SQL database",
                by: "tutorials point",
                url: "http://www.tutorialspoint.com",
                tags: ["mongodb", "database", "NoSQL"],
                likes: 100
        },
        {
        title: "NoSQL Database",
        description: "NoSQL database doesn't have tables",
        by: "tutorials point",
        url: "http://www.tutorialspoint.com",
        tags: ["mongodb", "database", "NoSQL"],
        likes: 20,
        comments: [
                {
                        user:"user1",
                        message: "My first comment",
                        dateCreated: new Date(2013,11,10,2,35),
                        like: 0
                }
        ]
}
])
```

# Insert Document – cont.

- Different behaviors and return values:

```
db.COLLECTION_NAME.insert(document_s)
```

```
db.COLLECTION_NAME.insertOne(document)
```

```
db.COLLECTION_NAME.insertMany(documents)
```

# Get all documents

- To get all the documents:

```
db.COLLECTION_NAME.find()
```

- Or in a formatted way:

```
db.COLLECTION_NAME.find().pretty()
```

# References

- https://www.xplenty.com/blog/the-sql-vs-nosql-difference
- https://www.educative.io/blog/mongodb-versus-postgresql-databases
- https://www.tutorialspoint.com/mongodb