Back-End Development

mongoDB Exploration

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Database

- A **database** is *an organized collection of data*.
- The **main purpose** of database is to operate large amount of information by storing, retrieving and managing.
- There are many dynamic websites on the world wide web nowadays which are handled through databases. For example, a model to checks the availability of rooms in a hotel. It is an example of dynamic website that uses database.

Non-RDBMS / NoSQL

- **NoSQL** or **Non-RDBMS** (*Non Relational Database Management Systems*) is database that is not modeled like relational model based.

- The data structure used by NoSQL databases are different from relational databases. It's faster and more flexible than relational db. That's why it's increasingly used in *big data* & *real time web application*.

- Here are the example of NoSQL database: MongoDB, Cassandra, CouchDB, OrientDB, IBM Domino, ArangoDB & Apache Ignite.

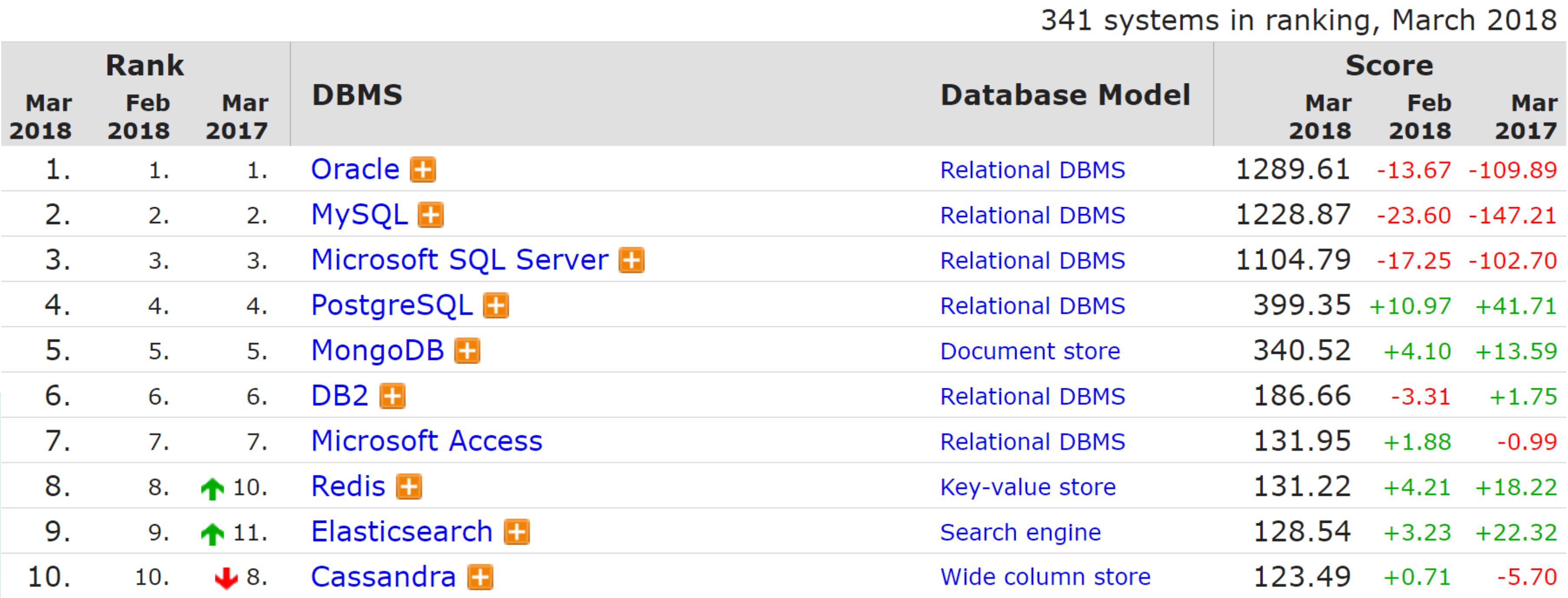
MongoDB

MongoDB is free & open source cross-platform document-oriented database. It’s classified as NoSQL database & uses JSON-like documents with schemas.

MongoDB has been developed by MongoDB Inc. since 11th February 2009, and is published under GNU Affero General Public License & the Apache License.

MongoDB Ranking

5th All DB-engines



341 systems in ranking, March 2018

Rank			DBMS	Database Model	Score		
Mar 2018	Feb 2018	Mar 2017			Mar 2018	Feb 2018	Mar 2017
1.	1.	1.	Oracle ⊞	Relational DBMS	1289.61	-13.67	-109.89
2.	2.	2.	MySQL ⊞	Relational DBMS	1228.87	-23.60	-147.21
3.	3.	3.	Microsoft SQL Server ⊞	Relational DBMS	1104.79	-17.25	-102.70
4.	4.	4.	PostgreSQL ⊞	Relational DBMS	399.35	+10.97	+41.71
5.	5.	5.	MongoDB ⊞	Document store	340.52	+4.10	+13.59
6.	6.	6.	DB2 ⊞	Relational DBMS	186.66	-3.31	+1.75
7.	7.	7.	Microsoft Access	Relational DBMS	131.95	+1.88	-0.99
8.	8.	↑ 10.	Redis ⊞	Key-value store	131.22	+4.21	+18.22
9.	9.	↑ 11.	Elasticsearch ⊞	Search engine	128.54	+3.23	+22.32
10.	10.	↓ 8.	Cassandra ⊞	Wide column store	123.49	+0.71	-5.70

https://db-engines.com/en/ranking

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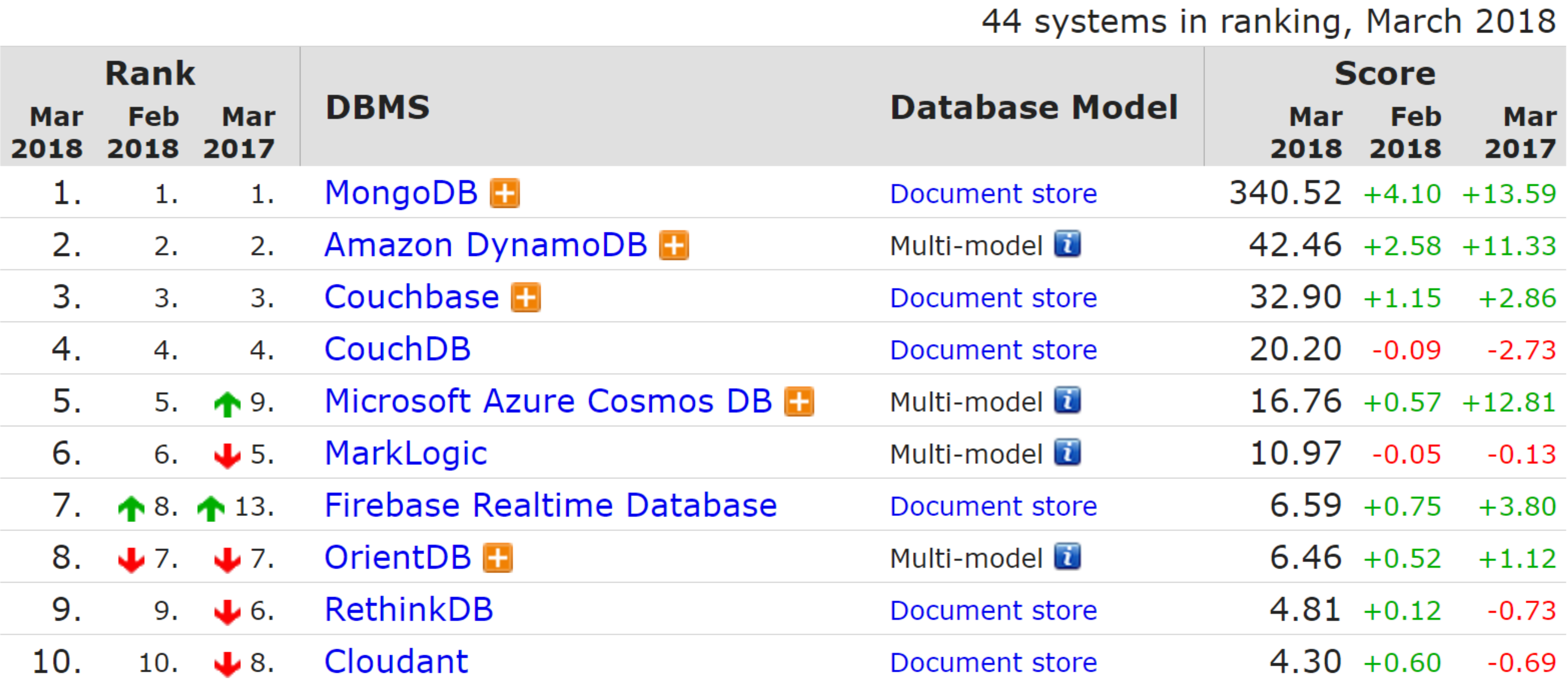
MongoDB Ranking

1st Doc Store DB-engines



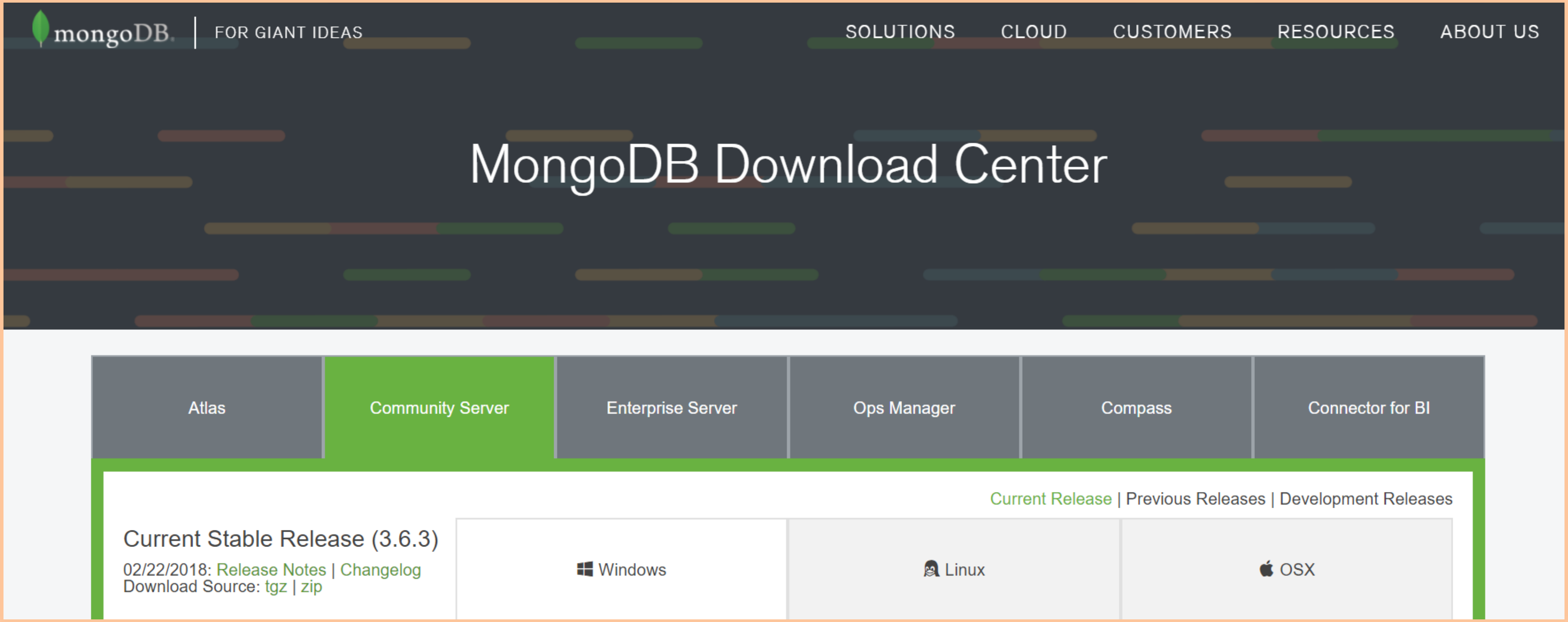
44 systems in ranking, March 2018

Rank			DBMS	Database Model	Score		
Mar 2018	Feb 2018	Mar 2017			Mar 2018	Feb 2018	Mar 2017
1.	1.	1.	MongoDB ⊞	Document store	340.52	+4.10	+13.59
2.	2.	2.	Amazon DynamoDB ⊞	Multi-model ℹ	42.46	+2.58	+11.33
3.	3.	3.	Couchbase ⊞	Document store	32.90	+1.15	+2.86
4.	4.	4.	CouchDB	Document store	20.20	-0.09	-2.73
5.	5.	↑ 9.	Microsoft Azure Cosmos DB ⊞	Multi-model ℹ	16.76	+0.57	+12.81
6.	6.	↓ 5.	MarkLogic	Multi-model ℹ	10.97	-0.05	-0.13
7.	↑ 8.	↑ 13.	Firebase Realtime Database	Document store	6.59	+0.75	+3.80
8.	↓ 7.	↓ 7.	OrientDB ⊞	Multi-model ℹ	6.46	+0.52	+1.12
9.	9.	↓ 6.	RethinkDB	Document store	4.81	+0.12	-0.73
10.	10.	↓ 8.	Cloudant	Document store	4.30	+0.60	-0.69

https://db-engines.com/en/ranking

Getting Started

- Create ***data*** & ***db*** folder at ***C:/data/db***
- Download & install MongoDB



MongoDB Download Center

Current Stable Release (3.6.3)

02/22/2018: Release Notes | Changelog
Download Source: tgz | zip

Activate Server

- Open terminal:

```
$ cd C:\Program Files\MongoDB\Server\3.6\bin
$ mongod --dbpath C:\data\db
$ mongod
```

- If OK, it will show `"Waiting for connections on port 27017"`. Then open new terminal:

```
$ cd C:\Program Files\MongoDB\Server\3.6\bin
$ mongo
```

How to Work With MongoDB Database

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Database

- Menampilkan daftar database:

```
$ show dbs
```

- Menampilkan db aktif (default: test):

```
$ db
```

- Membuat sekaligus menggunakan db “toko”:

```
$ use toko
```

- Hapus db “toko”:

```
$ use toko
$ db.dropDatabase()
```

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Collection

- Membuat db user:

```
$ db.createUser({user:"lintang",
pwd:"1234", roles:["readWrite",
"dbAdmin"]});
```

- Membuat collection “karyawan”:

```
$ db.createCollection('karyawan')
```

- Menampilkan daftar collection dalam db:

```
$ show collections
```

- Hapus collection “karyawan”:

```
$ db.karyawan.drop();
```

Add Data Record

- Add 1 data JSON ke collection ”karyawan”:

```
$ db.karyawan.insert({nama:"Adi",usia:24});
```

- Add multiple data ke collection “karyawan”:

```
$ db.karyawan.insert([
{nama:"Budi",usia:23},
{nama:"Caca",usia:25}]);
```

- Menampilkan data pada collection “karyawan”:

```
$ db.karyawan.find();
$ db.karyawan.find().pretty();
$ db.karyawan.find({nama: "Adi"}).pretty();
```

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Update

- Update **semua** property data:

```
$ db.karyawan.update({nama: "Adi"},
  {nama:"Adi",usia:21});
```

- Update property data tertentu:

```
$ db.karyawan.update({nama: "Budi"},
  {$set:{usia:26}});
```

- Update nama property:

```
$ db.karyawan.update({nama: "Caca"},
  {$rename:{"usia":"umur"}});
```

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Update Many

- Update **semua** data isinya hanya usia = 21:

```
$ db.karyawan.updateMany({},{usia:21});
```

- Update semua data property usia = 21:

```
$ db.karyawan.updateMany({},
  {$set:{usia:21}});
```

- Update nama property di semua data:

```
$ db.karyawan.updateMany({},
  {$rename:{"usia":"umur"}});
```

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Remove

- Hapus 1 property dari sebuah data:

```
$ db.karyawan.update({nama: "Adi"},
{$unset:{usia:true}});
```

```
$ db.karyawan.update({nama: "Budi"},
{$unset:{usia:1}});
```

- Hapus 1 data:

```
$ db.karyawan.remove({nama: "Caca"});
```

- Hapus semua data:

```
$ db.karyawan.remove({});
```

And & Or

- Tampilkan data yang memiliki property value nama = Budi ***dan*** usia = 21:

```
$ db.karyawan.find({$and:
[{nama:"Budi"},{usia:21}]}).pretty();
```

- Tampilkan data yang memiliki property value nama = Adi ***atau*** nama = Budi:

```
$ db.karyawan.find({$or:
[{nama:"Adi"},{nama:"Budi"}]}).pretty();
```

Lower and Greater Than

- Tampilkan data yang property usianya < 25:

```
$ db.karyawan.find({usia:{$lt:25}})
.pretty();
```

- Tampilkan data yang property usianya > 25:

```
$ db.karyawan.find({usia:{$gt:25}})
.pretty();
```

Lower and Greater Than Equal

- Tampilkan data yang property usianya <= 25:

```
$ db.karyawan.find({usia:{$lte:25}})
.pretty();
```

- Tampilkan data yang property usianya >= 25:

```
$ db.karyawan.find({usia:{$gte:25}})
.pretty();
```

Limit & Skip

- Tampilkan 2 data pertama:

```
$ db.karyawan.find().limit(2);
```

- Tampilkan 1 data setelah 2 data pertama:

```
$ db.karyawan.find().limit(1).skip(2);
```

- Tampilkan 3 data setelah 3 data pertama:

```
$ db.karyawan.find().limit(3).skip(3);
```

Sort

- Urutkan data ***ascending*** berdasarkan ***nama***:

```
$ db.karyawan.find().sort({nama:1});
```

- Urutkan data ***descending*** berdasarkan ***nama***:

```
$ db.karyawan.find().sort({nama:-1});
```

- Urutkan data ***ascending*** berdasarkan ***usia***:

```
$ db.karyawan.find().sort({usia:1});
```

- Urutkan data ***descending*** berdasarkan ***usia***:

```
$ db.karyawan.find().sort({usia:-1});
```

Count

- Hitung jumlah data di collection “karyawan”:

```
$ db.karyawan.find().count();
```

- Hitung jumlah data dg prop nama = Adi:

```
$ db.karyawan.find({nama:"Adi"}).count();
```

How to Work With MongoDB GUI Tools

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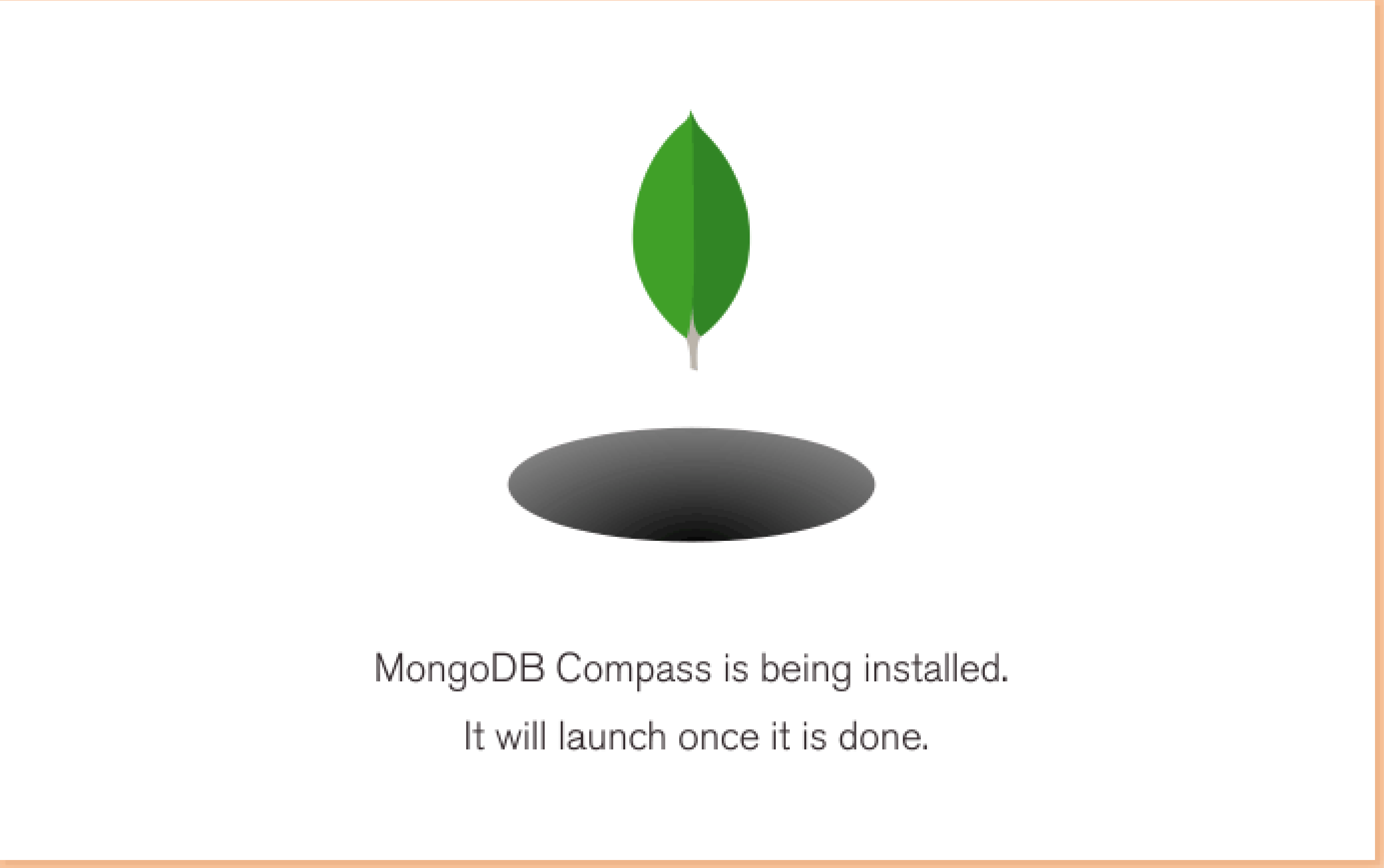
Working with GUI

#1 Installing MongoDB Compass

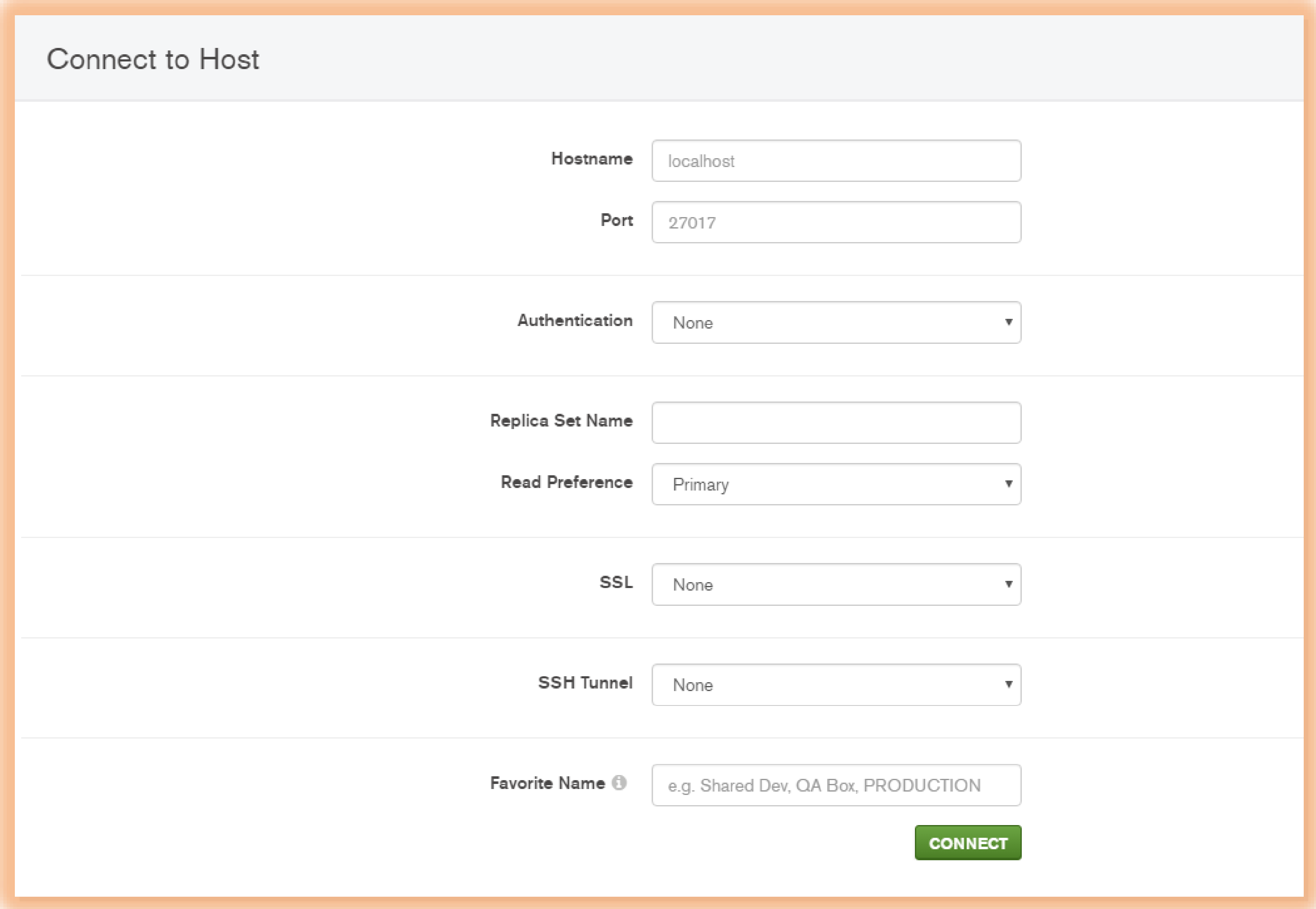


MongoDB Compass is being installed.

It will launch once it is done.

Working with GUI

#2 Connect to Server

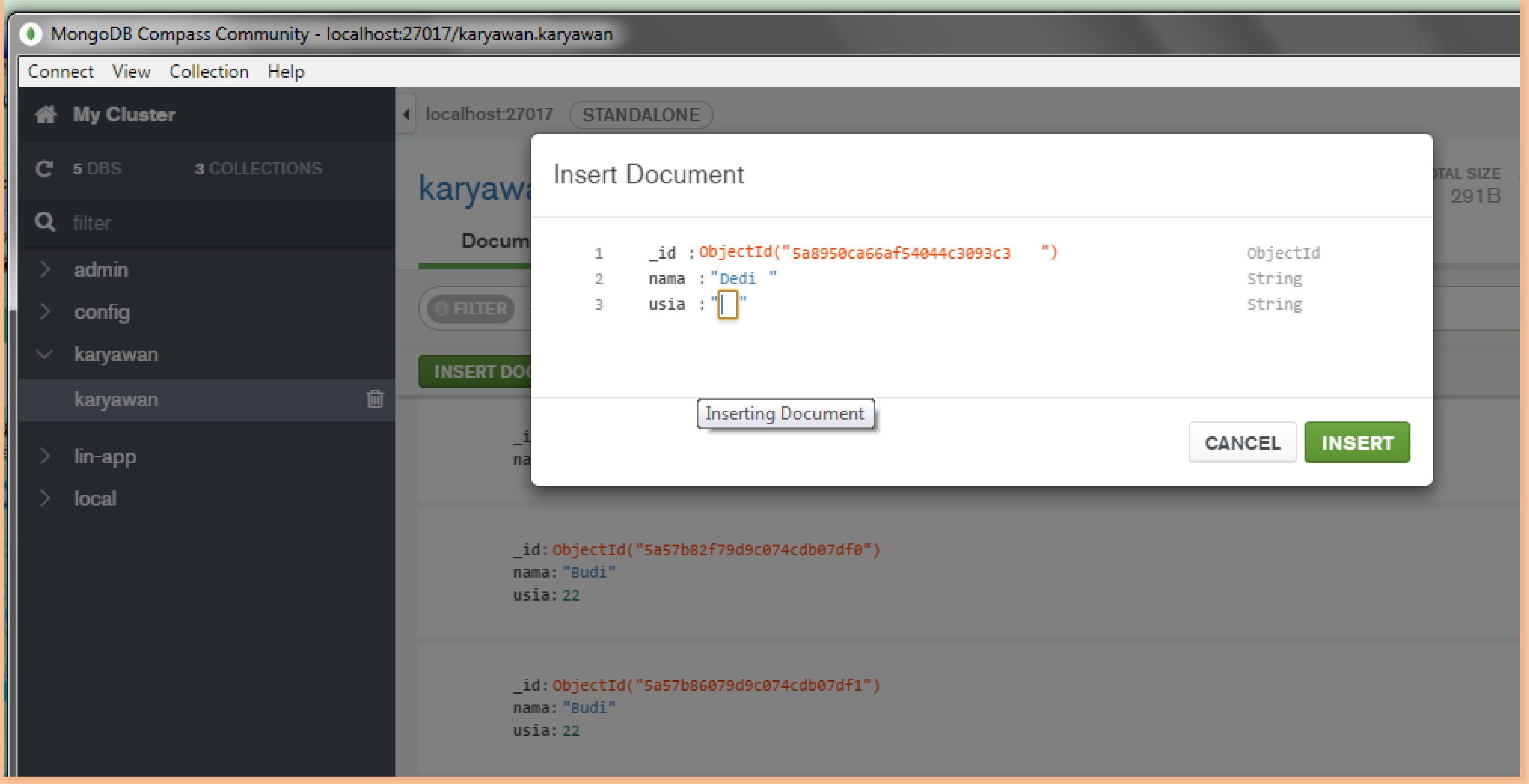


Connect to Host

Hostname	localhost
Port	27017
Authentication	None
Replica Set Name	
Read Preference	Primary
SSL	None
SSH Tunnel	None
Favorite Name	e.g. Shared Dev, QA Box, PRODUCTION

Working with GUI

#3 Explore by yourself!



```
_id  : ObjectId("5a8950ca66af54044c3093c3    ")   ObjectId
nama : "Dedi  "                                  String
usia : ""                                        String
```

```
_id: ObjectId("5a57b82f79d9c074cdb07df0")
nama: "Budi"
usia: 22
```

```
_id: ObjectId("5a57b86079d9c074cdb07df1")
nama: "Budi"
usia: 22
```

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How to Work With MongoDB Hosting

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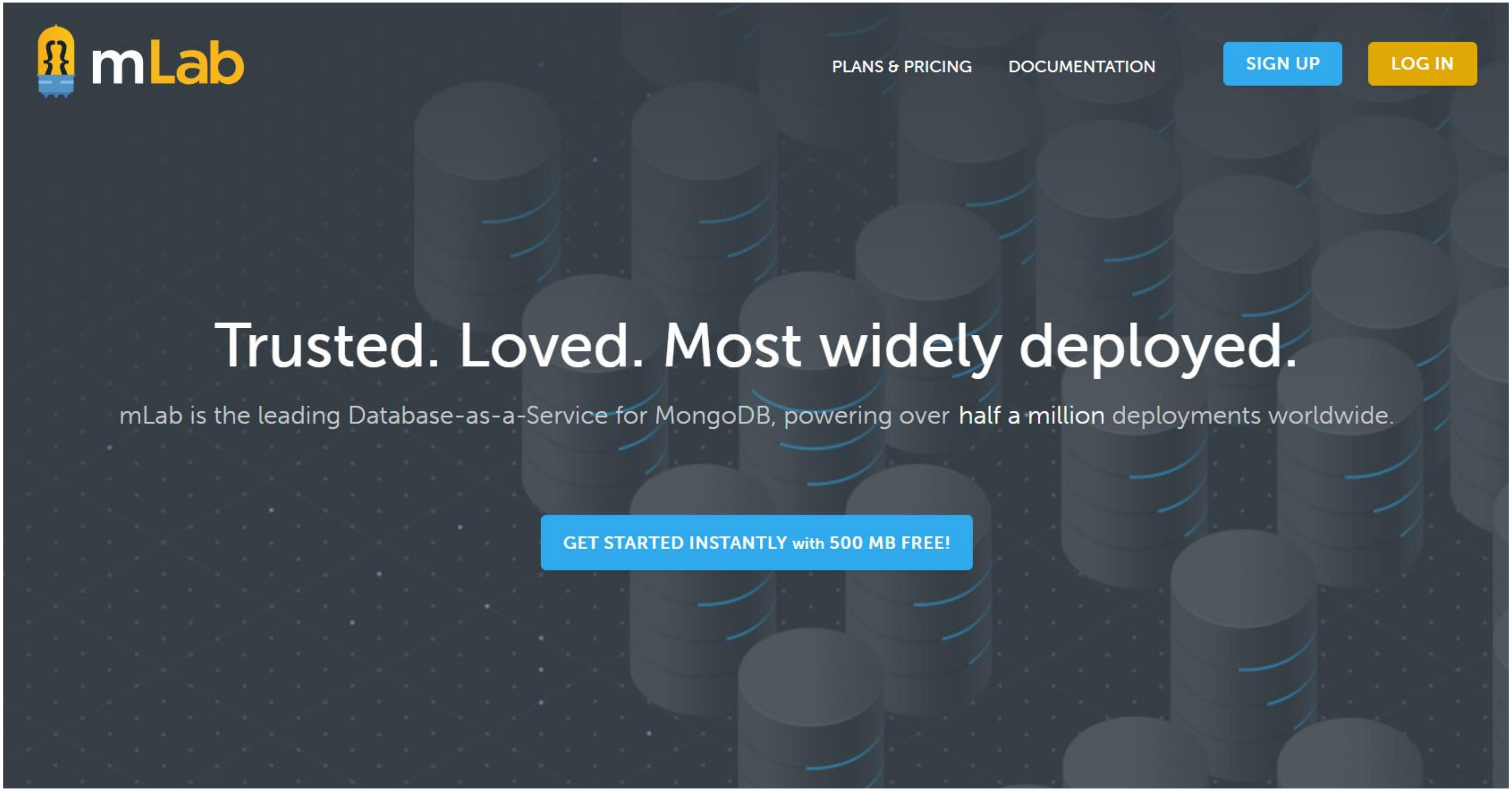

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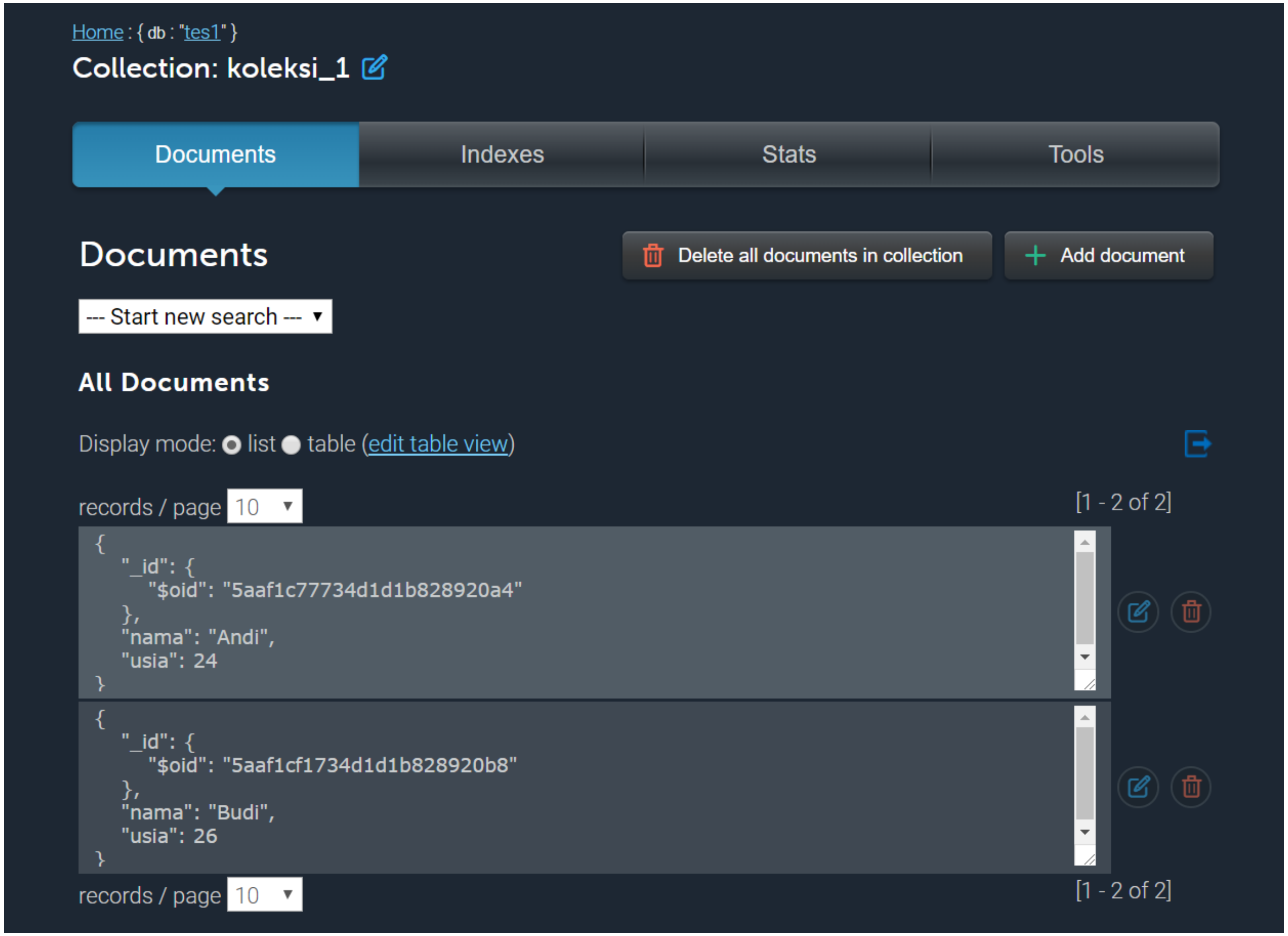

Home : { db : "tes1" }

Collection: koleksi_1

Documents

All Documents

Display mode: ● list ○ table (edit table view)

records / page 10 [1 - 2 of 2]

```
{
   "_id": {
      "$oid": "5aaf1c77734d1d1b828920a4"
   },
   "nama": "Andi",
   "usia": 24
}
```

```
{
   "_id": {
      "$oid": "5aaf1cf1734d1d1b828920b8"
   },
   "nama": "Budi",
   "usia": 26
}
```

records / page 10 [1 - 2 of 2]

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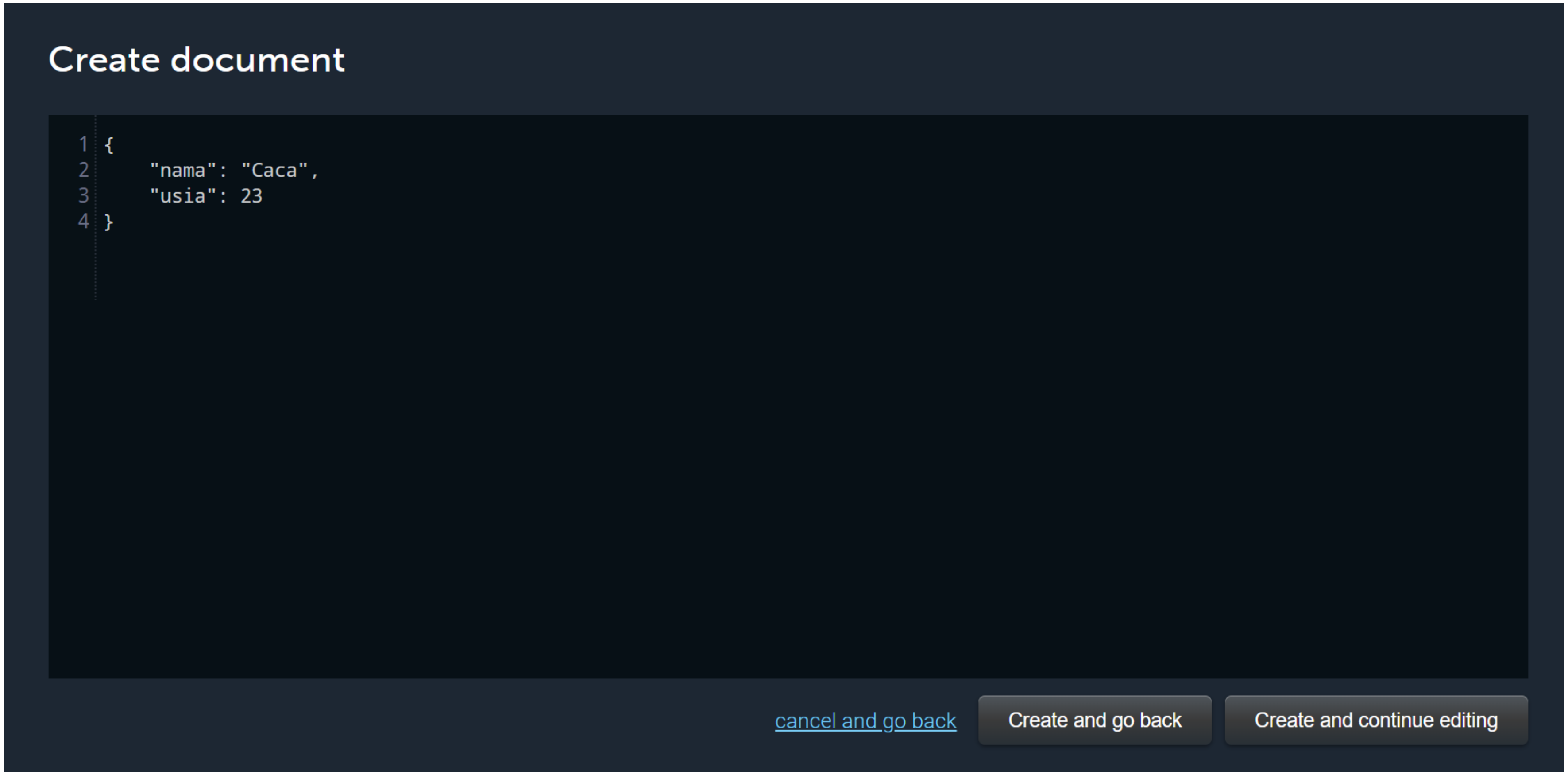

Create document

```
{
    "nama": "Caca",
    "usia": 23
}
```

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