B4M36DS2, BE4M36DS2: **Database Systems 2**

https://cw.fel.cvut.cz/wiki/courses/b4m36ds2/

Practical Class 10

MongoDB: Aggregation

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First Steps

Connect to our NoSQL server

- SSH / PuTTY and SFTP / WinSCP
- nosql.felk.cvut.cz

Start mongo shell

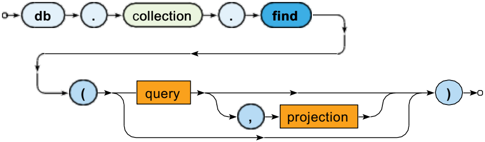
- **mongosh** --port 42222 -u login -p password database

Insert sample data into your database

- users.js
- checkin.js

Find Operation

Selects documents from a given collection



- Parameters
  - **Query**: description of documents to be selected
  - **Projection**: fields to be included / excluded in the result

Exercise 1

Express the following MongoDB query

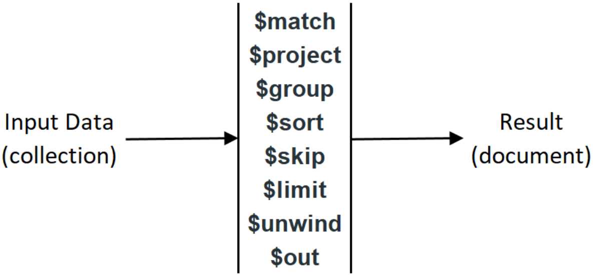
- **Find all users whose interests are "football" and "diving"**

Exercise 2

Express the following MongoDB query

- **Find *Prague* and *Brno* residents born in the *last century***

Aggregation pipeline



```
db.collection.aggregate( [ { <stage> }, ... ] )
```

Exercise 3

Express the following MongoDB query

- **Find the maximal number of friends.**

Exercise 4

Express the following MongoDB query

- **Find the number of users who are interested in both soccer and parties**

Exercise 5

Express the following MongoDB query

- **Find top three cities for vaccations**

Exercise 6

Express the following MongoDB query

- **Find users who have friends with _id 1 and 2 and sort them by registration date in descending order.**

Exercise 7

Express the following MongoDB query

- **Find vacation places, which are popular in winter.**

Exercise 8

Express the following MongoDB query

- **Find users who have more than 3 friends and sort them by the number of friends in descending order.**

Exercise 9

Express the following MongoDB query

- **Find the average age of users.**

Exercise 10

Express the following MongoDB query

- **Find users who registered after 2015 and sort them in descending order by registration date.**

Exercise 11

Express the following MongoDB query

- **Find the number of users who registered in each year.**

Exercise 12

Express the following MongoDB query

- **Find users registered after 2015, group them by city of residence, and create a list of names for each city.**

Exercise 13

Express the following MongoDB query

- **Who has the most friends?**
- **If several users have an equal number of friends, find them all.**

Join Collections

The $lookup stage lets you specify which collection you want to join with the current collection, and which fields that should match.

There are four required fields:

- from: The collection to use for lookup in the same database
- localField: The field in the primary collection that can be used as a unique identifier in the from collection.
- foreignField: The field in the from collection that can be used as a unique identifier in the primary collection.
- as: The name of the new field that will contain the matching documents from the from collection.

Exercise 14

Express the following MongoDB query

- **Find all check-ins for each user.**

Exercise 15

Express the following MongoDB query

- **Who has the most check-ins?**

  Show top-3.

Exercise 16

Express the following MongoDB query

- **Find all users interested in football and display the names of their friends.**