## ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ

# САНКТ-ПЕТЕРБУРГСКИЙ НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ, МЕХАНИКИ И ОПТИКИ

### Лабораторная работа №6

 $\langle\langle MongoDB\rangle\rangle$ 

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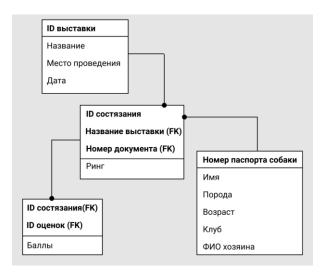
(Фамилия И.О)

### Цель работы

Овладеть практическими навыками реализации баз данных в MongoDB

## Индивидуальное задание

#### Модель



#### Создание БД

```
"dog": {
 "score": 15,
                                                                  "Document_num": 209483,
                                                                  "Name": "Molly",
 "registration": {
                                                          ...
  "reg_number": 4,
                                                                  "Dog_age": 7,
                                                                  "Breed": "Dalmatian",
  "ring": 3,
                                                                  "Club": "Friend",
  "show": {
   "Name": "Fantom",
                                                                  "Owner_name": "Sergei"
   "Place": "Saint Petersburg",
   "Date": "12/28/2020"
                                                               }
  },
  "dog": {
   "Document_num": 839420,
                                                               "score": 25,
   "Name": "Lacky",
                                                               "registration": {
                                                                "reg_number": 1,
   "Dog_age": 7,
                                                                "ring": 3,
   "Breed": "Spaniel",
   "Club": "Friend",
                                                                "show": {
                                                                  "Name": "Champion",
   "Owner_name": "Sofia"
                                                                  "Place": "Saint Petersburg",
                                                                  "Date": "04/28/2020"
 }
},
                                                                "dog": {
                                                                  "Document_num": 129588,
 "score": 18,
                                                                  "Name": "Bella",
                                                          ...
 "registration": {
                                                                  "Dog_age": 7,
                                                                  "Breed": "Spaniel",
  "reg_number": 2,
                                                                  "Club": "Friend",
  "ring": 1,
                                                                  "Owner_name": "Igor"
  "show": {
   "Name": "Champion",
   "Place": "Saint Petersburg",
                                                               }
   "Date": "04/28/2020"
  },
                                                               "score": 15,
  "dog": {
   "Document_num": 938726,
                                                               "registration": {
   "Name": "Scooby",
                                                                "reg_number": 5,
   "Dog_age": 8,
                                                                "ring": 2,
   "Breed": "Pudel",
                                                                "show": {
   "Club": "Cornuel",
                                                                  "Name": "Fantom",
   "Owner name": "Elena"
                                                                  "Place": "Saint Petersburg",
                                                                  "Date": "12/28/2020"
 }
                                                                },
                                                                 "dog": {
                                                                  "Document_num": 938726,
                                                                  "Name": "Scooby",
 "score": 24,
 "registration": {
                                                                  "Dog_age": 8,
  "reg number": 3,
                                                                  "Breed": "Pudel",
                                                                  "Club": "Cornuel",
  "ring": 2,
  "show": {
                                                                  "Owner_name": "Elena"
   "Name": "Champion",
   "Place": "Saint Petersburg",
                                                               }
   "Date": "04/28/2020"
  },
                                                          ...])
```

```
№1
db.dog_show.find({"registration.show.Place": "Saint Petersburg" })
   > db.dog_show.find({"registration.show.Place": "Saint Petersburg" })
 { "_id" : ObjectId("5ede190c46920bb001a5ba72"), "score" : 25, "registration" : { "reg_number" : 1, "ring" : 3, "show" : { "Name" : "Champion", "Place" : "Saint Petersburg", "Date" : "04/28/2020" }, "dog" : { "Document_num" : 129588, "Name [" : "Bella", "Dog_age" : 7, "Breed" : "Spaniel", "Club" : "Friend", "Owner_name" : "Igor" } } } { "_id" : ObjectId("5ede190c46920bb001a5ba73"), "score" : 18, "registration" : { "reg_number" : 2, "ring" : 1, "show" : { "Name" : "Champion", "Place" : "Saint Petersburg", "Date" : "04/28/2020" }, "dog" : { "Document_num" : 938726, "Name " : "Scooby", "Dog_age" : 8, "Breed" : "Pudel", "Club" : "Cornuel", "Owner_name" : "Elena" } } } { "_id" : ObjectId("5ede190c46920bb001a5ba74"), "score" : 24, "registration" : { "reg_number" : 3, "ring" : 2, "show" : { "Name" : "Champion", "Place" : "Saint Petersburg", "Date" : "04/28/2020" }, "dog" : { "Document_num" : 209483, "Name " : "Molly", "Dog_age" : 7, "Breed" : "Dalmatian", "Club" : "Friend", "Owner_name" : "Sergei" } } } { "_id" : ObjectId("5ede190c46920bb001a5ba75"), "score" : 15, "registration" : { "reg_number" : 4, "ring" : 3, "show" : { "Name" : "Fantom", "Place" : "Saint Petersburg", "Date" : "12/28/2020" }, "dog" : { "Document_num" : 839420, "Name" : "Lacky", "Dog_age" : 7, "Breed" : "Spaniel", "Club" : "Friend", "Owner_name" : "Sofia" } } } { "_id" : ObjectId("5ede190c46920bb001a5ba76"), "score" : 15, "registration" : { "reg_number" : 5, "ring" : 2, "show" : { "Name" : "Fantom", "Place" : "Saint Petersburg", "Date" : "12/28/2020" }, "dog" : { "Document_num" : 839420, "Name" : "Lacky", "Dog_age" : 7, "Breed" : "Saint Petersburg", "Date" : "12/28/2020" }, "dog" : { "Document_num" : 938726, "Name" : "Scooby", "Dog_age" : 8, "Breed" : "Pudel", "Club" : "Cornuel", "Owner_name" : "Elena" } } } } 
                                : ObjectId("5ede190c46920bb001a5ba72"), "score" : 25, "registration" : { "reg_number" : 1, "ring" : 3, "show" :
№2
db.dog_show.find({"registration.dog.Document_num": 938726})
 > db.dog_show.find({"registration.dog.Document_num": 938726 })
<u>№</u>3
db.dog_show.find({"registration.show.Name": "Fantom"})
   > db.dog_show.find({"registration.show.Name": "Fantom" })
| Canal Control | Control | Canal Control | Canal Control | Canal Control | Canal Ca
№4
db.dog_show.find({"registration.dog.Dog_age": {$gt : 6}})
     > db.dog_show.find({"registration.dog.Dog_age": {$gt : 6}})
       { "_id" : ObjectId("5ede190c46920bb001a5ba73"), "score" : 18, "registration" : { "reg_number" : 2, "ring" : 1, "show" :
№5
db.dog_show.find({"score": {$gt : 19}})
  > db.dog_show.find({"score": {$gt : 19}})
   > db.dog_show.find({"score": {\$gt : 19}})
{ "_id" : ObjectId("5ede190c46920bb001a5ba72"), "score" : 25, "registration" : { "reg_number" : 1, "ring" : 3, "show" :
{ "Name" : "Champion", "Place" : "Saint Petersburg", "Date" : "04/28/2020" }, "dog" : { "Document_num" : 129588, "Name
" : "Bella", "Dog_age" : 7, "Breed" : "Spaniel", "Club" : "Friend", "Owner_name" : "Igor" } } }
{ "_id" : ObjectId("5ede190c46920bb001a5ba74"), "score" : 24, "registration" : { "reg_number" : 3, "ring" : 2, "show" :
{ "Name" : "Champion", "Place" : "Saint Petersburg", "Date" : "04/28/2020" }, "dog" : { "Document_num" : 209483, "Name
" : "Molly", "Dog_age" : 7, "Breed" : "Dalmatian", "Club" : "Friend", "Owner_name" : "Sergei" } } }
```

#### MapReduce

```
var F1 = function() {
... emit(this.registration.dog.Name, this.score);
... };
>
    var F2 = function(names, score) {
... return Array.sum(score);
... };
>
    db.dog_show.mapReduce(
... F1,
... F2,
... { out: "whole_result" }
... )
```

Сумма баллов по собакам в выставках

```
{
    "result": "whole_result",
    "timeMillis": 174,
    "counts": {
        "input": 5,
        "reduce": 1,
        "output": 4
    },
    "ok": 1
}
[> db.whole_result.find()
{ "_id": "Bella", "value": 25 }
{ "_id": "Lacky", "value": 15 }
{ "_id": "Molly", "value": 24 }
{ "_id": "Scooby", "value": 33 }
```

### Вывод

В результате выполнения лабораторной работы были приобретены навыки создания баз данных и выполнения запросов к ним с использованием MongoDB.