

**ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ ОБРАЗОВАТЕЛЬНОЕ  
УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ  
САНКТ-ПЕТЕРБУРГСКИЙ НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ  
УНИВЕРСИТЕТ  
ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ, МЕХАНИКИ И ОПТИКИ**

Факультет «Инфокоммуникационных технологий»  
Направление подготовки «09.03.03 Мобильные и сетевые технологии»

## **О Т Ч Е Т**

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по Лабораторной работе №6

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Тема задания: Введение в MongoDB

**Выполнил:**

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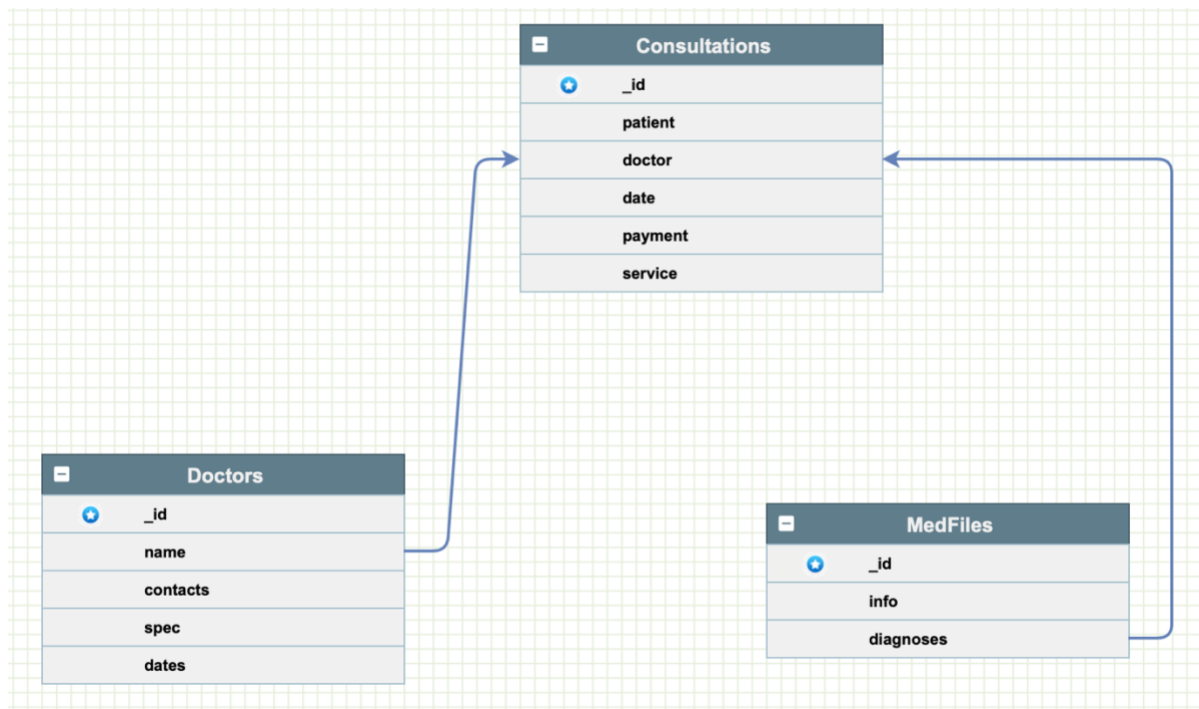
**Проверил:**

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(Фамилия И.О.)

**Санкт-Петербург  
2020**

**Цель:** овладеть практическими навыками и умениями реализации баз данных в MongoDB

## Модель новой БД



## Создание и заполнение БД

```
> db.Doctors.insertMany([
  ... _id: ObjectId(),
  ... "name": "Vasilisa Pupkina",
  ... "contacts": "emaildoctora@inbox.ru",
  ... "spec": "eye doctor",
  ... "dates": [{"date": new ISODate("2020-03-18T00:00:00Z"), "office": 17}]
  ... },
  ... {
  ... _id: ObjectId(),
  ... "name": "Stepanida Petrova",
  ... "contacts": "+78275193628",
  ... "spec": "Surgeon",
  ... "dates": [{"date": new ISODate("2020-03-18T00:00:00Z"), "office": 10}]
  ... },
  ... {
  ... _id: ObjectId(),
  ... "name": "Victor Shvabrin",
  ... "contacts": "+79272638888",
  ... "spec": "otolaryngologist",
  ... "dates": [{"date": new ISODate("2020-03-16T00:00:00Z"), "office": 12}, {"date": new Date("<2020-03-17>"), "office": 12}]
  ... },
  ... {
  ... _id: ObjectId(),
  ... "name": "Roman Kefirov",
  ... "contacts": "+79210231313",
  ... "spec": "gastroenterologist",
  ... "dates": [{"date": new ISODate("2020-03-19T00:00:00Z"), "office": 23}]
  ... },
  ... {
  ... _id: ObjectId(),
  ... "name": "Angus Dotin",
  ... "contacts": "+79524812234",
  ... "spec": "germatologist",
  ... "dates": [{"date": new ISODate("2020-03-20T00:00:00Z"), "office": 6}]]])
{
```

```

        "acknowledged" : true,
        "insertedIds" : [
            ObjectId("5f02f43f6e1c06ec4142127b"),
            ObjectId("5f02f43f6e1c06ec4142127c"),
            ObjectId("5f02f43f6e1c06ec4142127d"),
            ObjectId("5f02f43f6e1c06ec4142127e"),
            ObjectId("5f02f43f6e1c06ec4142127f")
        ]
    }
}
> db.MedFiles.insertMany([
... _id: ObjectId(),
... "info": {
... "name": "Vasiliy Pupkin",
... "sex": "male",
... "bd": new ISODate("2000-04-19T00:00:00Z")
... },
... "diagnoses": [{"name": "dermatitis", "status": "cured"}]
... },
... {
... _id: ObjectId(),
... "info": {
... "name": "Stepan Petrov",
... "sex": "male",
... "bd": new ISODate("1974-03-20T00:00:00Z")
... },
... "diagnoses": [{"name": "gastritis", "status": "chronic"}]
... },
... {
... _id: ObjectId(),
... "info": {
... "name": "Roman Ochakov",
... "sex": "male",
... "bd": new ISODate("1996-09-14T00:00:00Z")
... },
... "diagnoses": [{"name": "pharyngitis", "status": "active"}]
... },
... {
... _id: ObjectId(),
... "info": {
... "name": "Vika Shvabrina",
... "sex": "female",
... "bd": new ISODate("1985-06-03T00:00:00Z")
... },
... "diagnoses": [{"name": "sprained ankle", "status": "cured"}]
... },
... {
... _id: ObjectId(),
... "info": {
... "name": "Anna Dotina",
... "sex": "female",
... "bd": new ISODate("1994-08-30T00:00:00Z")
... },
... "diagnoses": [{"name": "myopia", "status": "chronic"}]
... }
... ])
{
    "acknowledged" : true,
    "insertedIds" : [
        ObjectId("5f02f45a6e1c06ec41421280"),
        ObjectId("5f02f45a6e1c06ec41421281"),
        ObjectId("5f02f45a6e1c06ec41421282"),
        ObjectId("5f02f45a6e1c06ec41421283"),
    ]
}

```

```

        ObjectId("5f02f45a6e1c06ec41421284")
    }
}
> db.Cons.insertMany([
  ... _id: ObjectId(),
  ... "patient": "Roman Ochakov",
  ... "doctor": "Viktor Shvabrin",
  ... "date": new ISODate("2020-03-16T00:00:00Z"),
  ... "payment": true,
  ... "service": [{"name": "visit", "price": 1000}, {"name": "blood sampling", "price": 700}]
  ... },
  ... {
  ... _id: ObjectId(),
  ... "patient": "Roman Ochakov",
  ... "doctor": "Viktor Shvabrin",
  ... "date": new ISODate("2020-03-17T00:00:00Z"),
  ... "payment": false,
  ... "service": [{"name": "repeated visit", "price": 700}]
  ... },
  ... {
  ... _id: ObjectId(),
  ... "patient": "Anna Dotina",
  ... "doctor": "Vasilisa Pupkina",
  ... "date": new ISODate("2020-03-18T00:00:00Z"),
  ... "payment": true,
  ... "service": [{"name": "visit", "price": 1000}]
  ... },
  ... {
  ... _id: ObjectId(),
  ... "patient": "Vasiliy Pupkin",
  ... "doctor": "Stepanida Petrova",
  ... "date": new ISODate("2020-03-18T00:00:00Z"),
  ... "payment": false,
  ... "service": [{"name": "visit", "price": 1000}]
  ... },
  ... {
  ... _id: ObjectId(),
  ... "patient": "Vika Shvabrina",
  ... "doctor": "Roman Kefirov",
  ... "date": new ISODate("2020-03-19T00:00:00Z"),
  ... "payment": true,
  ... "service": [{"name": "visit", "price": 1000}, {"name": "x-ray", "price": 500}]
  ... }])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5f02f4766e1c06ec41421286"),
    ObjectId("5f02f4766e1c06ec41421287"),
    ObjectId("5f02f4766e1c06ec41421288"),
    ObjectId("5f02f4766e1c06ec41421289"),
    ObjectId("5f02f4766e1c06ec4142128a")
  ]
}

```

## Запросы к БД

### 1) Женщины с миопией

```

> db.MedFiles.find({"info.sex": "female", "diagnoses.name": "myopia"})
{ "_id" : ObjectId("5f0225276e1c06ec41421275"), "info" : { "name" : "Anna Dotina", "sex" :
"female", "bd" : ISODate("1970-01-01T00:00:00Z") }, "diagnoses" : [ { "name" : "myopia",
"status" : "chronic" } ] }

```

### 2) Все окулисты

```
> db.Doctors.find({"spec": "eye doctor"})
{ "_id" : ObjectId("5f0220206e1c06ec4142126c"), "name" : "Vasilisa Pupkina", "contacts" :
"emaildoctora@inbox.ru", "spec" : "eye doctor", "dates" : [ { "date" : ISODate("1970-01-01
T00:00:00Z"), "office" : 17 } ] }
```

### 3) Оплаченные консультации 18 марта

```
> db.Cons.find({"payment": true, "date": ISODate("2020-03-18T00:00:00Z")})
{ "_id" : ObjectId("5f02f4766e1c06ec41421288"), "patient" : "Anna Dotina", "doctor" :
"Vasilisa Pupkina", "date" : ISODate("2020-03-18T00:00:00Z"), "payment" : true, "servi
ce" : [ { "name" : "visit", "price" : 1000 } ] }
```

### 4) Количество оплаченных консультаций

```
> db.Cons.count({"payment": true})
3
```

### 5) Кабинеты в доступном расписании

```
> db.Doctors.find({}, {"dates.office": 1})
{ "_id" : ObjectId("5f02f43f6e1c06ec4142127b"), "dates" : [ { "office" : 17 } ] }
{ "_id" : ObjectId("5f02f43f6e1c06ec4142127c"), "dates" : [ { "office" : 10 } ] }
{ "_id" : ObjectId("5f02f43f6e1c06ec4142127d"), "dates" : [ { "office" : 12 }, {
{ "_id" : ObjectId("5f02f43f6e1c06ec4142127e"), "dates" : [ { "office" : 23 } ] }
{ "_id" : ObjectId("5f02f43f6e1c06ec4142127f"), "dates" : [ { "office" : 6 } ] }
```

### 6) Имя доктора и кабинет, в котором он работал 18 марта

```
> db.Doctors.find({"dates.date": ISODate("2020-03-18T00:00:00Z")}, {"name": 1, "dates.office": 1})
{ "_id" : ObjectId("5f02f43f6e1c06ec4142127b"), "name" : "Vasilisa Pupkina", "dates" : [ { "office" : 17 } ] }
{ "_id" : ObjectId("5f02f43f6e1c06ec4142127c"), "name" : "Stepanida Petrova", "dates" : [ { "office" : 10 } ] }
```

### 7) MapReduce

```
> db.Doctors.mapReduce(
... function() { emit(this.name, this.spec); },
... function(values) { return values; },
... { out: "mapreduce_call" }
...);
{ "result" : "mapreduce_call",
"timeMillis" : 77,
"counts" : {
"input" : 5,
"emit" : 5,
"reduce" : 0,
"output" : 5
},
"ok" : 1
}
> db.mapreduce_call.find()
{ "_id" : "Angus Dotin", "value" : "germatologist" }
{ "_id" : "Roman Kefirov", "value" : "gastroenterologist" }
{ "_id" : "Stepanida Petrova", "value" : "Surgeon" }
{ "_id" : "Vasilisa Pupkina", "value" : "eye doctor" }
{ "_id" : "Victor Shvabrin", "value" : "otolaryngologist" }
```