

**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»

Лабораторная работа №6

Тема Знакомство с MongoDB
задания:

Выполнил:

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К3241
номер группы

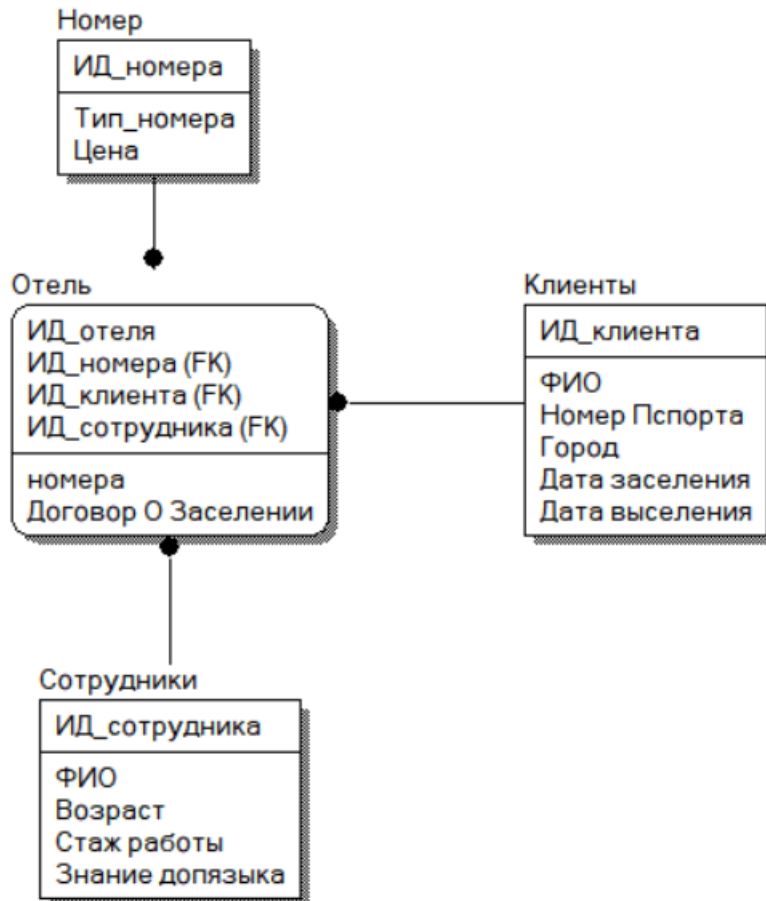
**Санкт-Петербург
2020**

Вариант №1

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

Ход работы:

Новая модель (упрощенная):



Создание БД:

```
> use Hotel
switched to db Hotel
>
```

Создание коллекции Клиент(Customer) и заполнение ее данными о клиентах

```
> db.customer.insertMany([ {"Fname":"Alisher","Lname":"Akhmetzhanov","City":"Almaty","Passport":"A11111","DateEntered":"25/06/2020","DateEviction":"25/07/2020"} ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb683d7ebec5c5315eff94")
  ]
}
```

```
> db.customer.insertMany([ { "Fname":"Mansur","Lname":"Akhmetzhanov","City":"Almaty","Passport":"A22222","DateEntered":"25/06/2020","DateEviction":"28/07/2020" } ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb69c07ebec5c5315eff95")
  ]
}
> db.customer.insertMany([ { "Fname":"Ivan","Lname":"Ivanov","City":"Moscow","Passport":"A33333","DateEntered":"20/04/2020","DateEviction":"20/05/2020" } ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb6adb7ebec5c5315eff96")
  ]
}
> db.customer.insertMany([ { "Fname":"Ilya","Lname":"Polyakov","City":"Astana","Passport":"A44444","DateEntered":"10/03/2020","DateEviction":"10/04/2020" } ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb6b6d7ebec5c5315eff97")
  ]
}
> db.customer.insertMany([ { "Fname":"Sveta","Lname":"Alekseevna","City":"Tver","Passport":"A55555","DateEntered":"11/03/2019","DateEviction":"11/04/2019" } ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb6bdc7ebec5c5315eff98")
  ]
}
```

Проверим наличие данных в коллекции:

```
> db.customer.find()
{ "_id" : ObjectId("5efb683d7ebec5c5315eff94"), "Fname" : "Alisher", "Lname" : "Akhmetzhanov", "City" : "Almaty", "Passport" : "A11111", "DateEntered" : "25/06/2020", "DateEviction" : "25/07/2020" }
{ "_id" : ObjectId("5efb69c07ebec5c5315eff95"), "Fname" : "Mansur", "Lname" : "Akhmetzhanov", "City" : "Almaty", "Passport" : "A22222", "DateEntered" : "25/06/2020", "DateEviction" : "28/07/2020" }
{ "_id" : ObjectId("5efb6adb7ebec5c5315eff96"), "Fname" : "Ivan", "Lname" : "Ivanov", "City" : "Moscow", "Passport" : "A33333", "DateEntered" : "20/04/2020", "DateEviction" : "20/05/2020" }
{ "_id" : ObjectId("5efb6b6d7ebec5c5315eff97"), "Fname" : "Ilya", "Lname" : "Polyakov", "City" : "Astana", "Passport" : "A44444", "DateEntered" : "10/03/2020", "DateEviction" : "10/04/2020" }
{ "_id" : ObjectId("5efb6bdc7ebec5c5315eff98"), "Fname" : "Sveta", "Lname" : "Alekseevna", "City" : "Tver", "Passport" : "A55555", "DateEntered" : "11/03/2019", "DateEviction" : "11/04/2019" }
```

Создание коллекции сотрудники (worker) и заполнение ее информацией

```
> db.worker.insertMany([ { "Fname":"Amir","Lname":"Kim","Age": 20,"Stazh": 2,"languages": ["english", "kazakh"] } ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb6e207ebec5c5315eff99")
  ]
}
> db.worker.insertMany([ { "Fname":"Oleg","Lname":"Boratov","Age": 25,"Stazh": 4,"languages": ["english"] } ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb6f2d7ebec5c5315eff9a")
  ]
}
> db.worker.insertMany([ { "Fname":"Alan","Lname":"Utegenov","Age": 28,"Stazh": 7,"languages": ["english", "kazakh"] } ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb6f717ebec5c5315eff9b")
  ]
}
> db.worker.insertMany([ { "Fname":"Arman","Lname":"Ahmetov","Age": 19,"Stazh": 1,"languages": ["kazakh"] } ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb6fb47ebec5c5315eff9c")
  ]
}
> db.worker.insertMany([ { "Fname":"Suleiman","Lname":"Ahmatov","Age": 35,"Stazh": 9,"languages": ["turkish","kazakh"] } ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb70077ebec5c5315eff9d")
  ]
}
```

Проверим наличие данных о сотрудниках в коллекции:

```
}
> db.worker.find()
{ "_id" : ObjectId("5efb6e207ebec5c5315eff99"), "Fname" : "Amir", "Lname" : "Kim", "Age" : 20, "Stazh" : 2, "languages" : [ "english", "kazakh" ] }
{ "_id" : ObjectId("5efb6f2d7ebec5c5315eff9a"), "Fname" : "Oleg", "Lname" : "Borotov", "Age" : 25, "Stazh" : 4, "languages" : [ "english" ] }
{ "_id" : ObjectId("5efb6f717ebec5c5315eff9b"), "Fname" : "Alan", "Lname" : "Utegenov", "Age" : 28, "Stazh" : 7, "languages" : [ "english", "kazakh" ] }
{ "_id" : ObjectId("5efb6fb47ebec5c5315eff9c"), "Fname" : "Arman", "Lname" : "Ahmetov", "Age" : 19, "Stazh" : 1, "languages" : [ "kazakh" ] }
{ "_id" : ObjectId("5efb70077ebec5c5315eff9d"), "Fname" : "Suleiman", "Lname" : "Ahmatov", "Age" : 35, "Stazh" : 9, "languages" : [ "turkish", "kazakh" ] }
}
```

Создание коллекции Номер (Room) и заполнение ее информацией:

```
> db.room.insertMany([ {"type":"econom", "price": 500} ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb78647ebec5c5315effa1")
  ]
}
> db.room.insertMany([ {"type":"comfort", "price": 1500} ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb786f7ebec5c5315effa2")
  ]
}
> db.room.insertMany([ {"type":"business", "price": 2500} ])
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("5efb78977ebec5c5315effa3")
  ]
}
```

Проверка наличия данных в коллекции Room:

```
> db.room.find()
{ "_id" : ObjectId("5efb78647ebec5c5315effa1"), "type" : "econom", "price" : 500 }
{ "_id" : ObjectId("5efb786f7ebec5c5315effa2"), "type" : "comfort", "price" : 1500 }
{ "_id" : ObjectId("5efb78977ebec5c5315effa3"), "type" : "business", "price" : 2500 }
> 
```

Запросы:

1) Получение информации о типах номеров, стоимость которых больше 1000

```
> db.room.find({"price":{"$gt : 1000}})
{ "_id" : ObjectId("5efb786f7ebec5c5315effa2"), "type" : "comfort", "price" : 1500 }
{ "_id" : ObjectId("5efb78977ebec5c5315effa3"), "type" : "business", "price" : 2500 }
>
```

2) Получение записей с определенной датой заселения или выселения

```
> db.customer.find({"$or : [{"DateEntered":"25/06/2020"}, {"DateEviction":"10/04/2020"}]})
{ "_id" : ObjectId("5efb683d7ebec5c5315eff94"), "Fname" : "Alisher", "Lname" : "Akhmetzhanov", "City" : "Almaty", "Passport" : "A11111", "DateEntered" : "25/06/2020", "DateEviction" : "25/07/2020" }
{ "_id" : ObjectId("5efb69c07ebec5c5315eff95"), "Fname" : "Mansur", "Lname" : "Akhmetzhanov", "City" : "Almaty", "Passport" : "A22222", "DateEntered" : "25/06/2020", "DateEviction" : "28/07/2020" }
{ "_id" : ObjectId("5efb6b6d7ebec5c5315eff97"), "Fname" : "Ilya", "Lname" : "Polyakov", "City" : "Astana", "Passport" : "A44444", "DateEntered" : "10/03/2020", "DateEviction" : "10/04/2020" }
>
```

3) Получение информации о клиентах с фамилией Akhmetzhanov

```
> db.customer.find({"Lname":"Akhmetzhanov"})
{ "_id" : ObjectId("5efb683d7ebec5c5315eff94"), "Fname" : "Alisher", "Lname" : "Akhmetzhanov", "City" : "Almaty", "Passport" : "A11111", "DateEntered" : "25/06/2020", "DateEviction" : "25/07/2020" }
{ "_id" : ObjectId("5efb69c07ebec5c5315eff95"), "Fname" : "Mansur", "Lname" : "Akhmetzhanov", "City" : "Almaty", "Passport" : "A22222", "DateEntered" : "25/06/2020", "DateEviction" : "28/07/2020" }
>
```

4) Вывести информацию о всех сотрудниках, которые знают казахский и английский языки и стаж которых больше года

```
> db.worker.find({"$and":[{"languages": ["english", "kazakh"]}, {"Stazh":{"$gt : 1}}]})
{ "_id" : ObjectId("5efb6e207ebec5c5315eff99"), "Fname" : "Amir", "Lname" : "Kim", "Age" : 20, "Stazh" : 2, "languages" : [ "english", "kazakh" ] }
{ "_id" : ObjectId("5efb6f717ebec5c5315eff9b"), "Fname" : "Alan", "Lname" : "Utegenov", "Age" : 28, "Stazh" : 7, "languages" : [ "english", "kazakh" ] }
>
```

5) Вывести информацию о клиенте с фамилией Ахметжанов и номером паспорта "A11111"

```
> db.customer.find({"Lname":"Akhmetzhanov", "Passport":"A11111"})
{ "_id" : ObjectId("5efb683d7ebec5c5315eff94"), "Fname" : "Alisher", "Lname" : "Akhmetzhanov", "City" : "Almaty", "Passport" : "A11111", "DateEntered" : "25/06/2020", "DateEviction" : "25/07/2020" }
>
```

Вывод:

Во время выполнения лабораторной работы были изучены и применены знания для создания документ ориентированных баз данных с помощью MongoDB.