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«САНКТ-ПЕТЕРБУРГСКИЙ НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ
УНИВЕРСИТЕТ ИТМО»
Факультет среднего профессионального образования

ОТЧЕТ
О ЛАБОРАТОРНОЙ РАБОТЕ № 7

по теме: Знакомство с MongoDB

по дисциплине: Основы проектирования баз данных

Специальность 09.02.07 Информационные системы и программирование

Проверил:

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Дата: «_____» _____ 2020г.

Оценка _____

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

Практическое задание:

Для выполнения работы Вам потребуется:

- a. Попытаться уменьшить размер модели реляционной базы данных, с которой Вы работали.
- b. Реализовать Вашу модель в MongoDB.
- c. Заполнить модель данными, настолько, чтобы все запросы, реализуемые Вами в пункте 2.d выдавали непустые строки.
- d. Реализовать минимум 40% Ваших запросов, сделанных в работе по реляционным базам данных в MongoDB.

Перечень запросов:

Необходимо реализовать некоторое количество SQL-запросов.

Запросы:

- a) Вывести информацию о номере приема и врачах, которые проводили приемы;
- b) Вывести информацию о врачах, родившихся в период с 01.01.1980 по 01.01.1990;
- c) Вывести информацию о всех пациентах;
- d) Вывести пациентов и их диагнозы;
- e) Вывести врачей с профессией окулист;
- f) Вывести информацию о наибольшем счете;
- g) Вывести информацию о расписании врачей, имена врачей и их профессии.

ВЫПОЛНЕНИЕ

1) Схема физической модели БД, спроектированной с использованием СА Erwin Data Modeler представлена на рисунке №1.

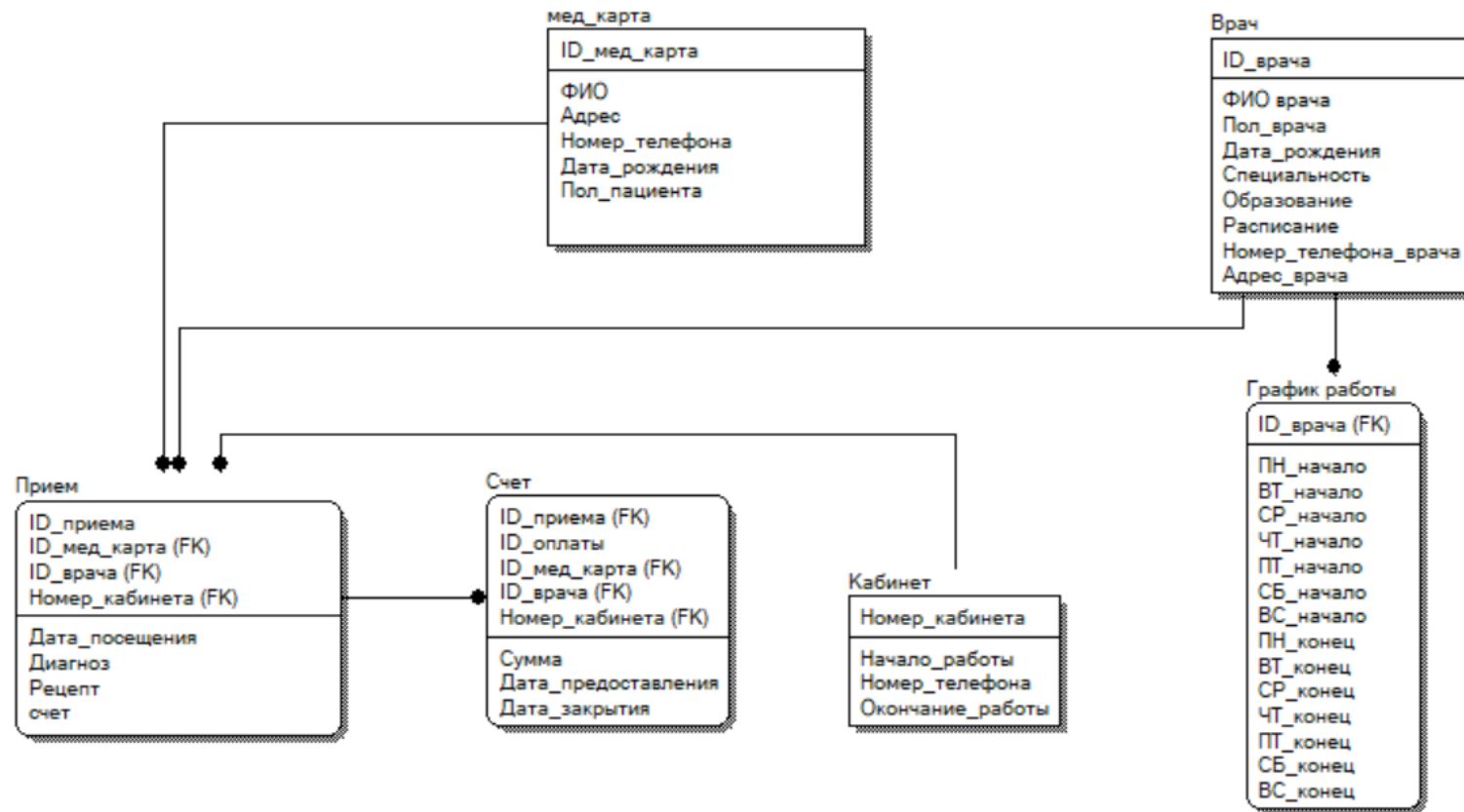


Рисунок 1 Схема инфологической модели данных БД, выполненная в среде СА ERwin Process Modeler

2) Логи модели:

```
db.createCollection("doctor")
db.createCollection("cabinet")
db.createCollection("medical_card")
db.createCollection("appointment")
db.createCollection("payment")
db.createCollection("schedule")
```

```
db.doctor.insert({d_id: 1, d_full_name: "Doctor 1", d_gender: true, d_dob:
new Date('1978-01-01'), d_education: "8 years", d_profession: "psychologist",
d_phone_num: 1265522, d_address: "Street 5 home 5 flat 5"})
```

```
db.doctor.insert({d_id: 2, d_full_name: "Doctor 2", d_gender: false, d_dob:
new Date('1983-03-03'), d_education: "10 years", d_profession: "gynecologist",
d_phone_num: 1234244, d_address: "Street 6 home 6 flat 6"})
```

```
db.doctor.insert({d_id: 3, d_full_name: "Doctor 3", d_gender: false, d_dob:
new Date('1989-04-01'), d_education: "6 years", d_profession: "optometrist",
d_phone_num: 5623447, d_address: "Street 7 home 7 flat 7"})
```

```
db.doctor.insert({d_id: 4, d_full_name: "Doctor 4", d_gender: true, d_dob:
new Date('1967-09-02'), d_education: "12 years", d_profession: "endocrinologist",
d_phone_num: 1238899, d_address: "Street 8 home 8 flat 8"})
```

```
db.doctor.insert({d_id: 5, d_full_name: "Doctor 5", d_gender: true, d_dob:
new Date('1977-01-01'), d_education: "8 years", d_profession: "psychologist",
d_phone_num: 1265521, d_address: "Street 5 home 5 flat 4"})
```

```
db.doctor.insert({d_id: 6, d_full_name: "Doctor 6", d_gender: false, d_dob:
new Date('1982-03-03'), d_education: "10 years", d_profession: "gynecologist",
d_phone_num: 1234243, d_address: "Street 6 home 6 flat 5"})
```

```
db.doctor.insert({d_id: 7, d_full_name: "Doctor 7", d_gender: false, d_dob:
new Date('1988-04-01'), d_education: "6 years", d_profession: "optometrist",
d_phone_num: 5623446, d_address: "Street 7 home 7 flat 6"})
```

```
db.doctor.insert({d_id: 8, d_full_name: "Doctor 8", d_gener: true, d_dob: new
Date('1966-09-02'), d_education: "12 years", d_profession: "endocrinologist",
d_phone_num: 1238898, d_address: "Street 8 home 8 flat 7"})
```

```
db.cabinet.insert({c_number: 1, c_shedule: "10:30-17:45", c_phone_num:
1111111})
```

```
db.cabinet.insert({c_number: 2, c_shedule: "08:00-20:45", c_phone_num:
2222222})
```

```
db.cabinet.insert({c_number: 3, c_shedule: "09:15-20:45", c_phone_num:
3333333})
```

```
db.cabinet.insert({c_number: 4, c_shedule: "11:30-18:45", c_phone_num:
4444444})
```

```
db.cabinet.insert({c_number: 5, c_shedule: "09:15-20:45", c_phone_num:
5555555})
```

```
db.cabinet.insert({c_number: 6, c_shedule: "11:30-18:45", c_phone_num: 6666666})
```

```
db.cabinet.insert({c_number: 7, c_shedule: "09:15-20:45", c_phone_num: 7777777})
```

```
db.cabinet.insert({c_number: 8, c_shedule: "11:30-18:45", c_phone_num: 8888888})
```

```
db.medical_card.insert({mc_id: 1, mc_full_name: "Patient 1", mc_gender: true, mc_dob: new Date('1990-12-20'), mc_address: "Street 1 home 1 flat 1", mc_phone_num: 1532789})
```

```
db.medical_card.insert({mc_id: 2, mc_full_name: "Patient 2", mc_gender: true, mc_dob: new Date('1990-10-20'), mc_address: "Street2 home 1 flat 1", mc_phone_num: 1532718})
```

```
db.medical_card.insert({mc_id: 3, mc_full_name: "Patient 3", mc_gender: false, mc_dob: new Date('2001-02-20'), mc_address: "Street 4 home 1 flat 1", mc_phone_num: 3445119})
```

```
db.medical_card.insert({mc_id: 4, mc_full_name: "Patient 4", mc_gender: false, mc_dob: new Date('1970-04-13'), mc_address: "Street 11 home 1 1flat 1", mc_phone_num: 3482328})
```

```
db.medical_card.insert({mc_id: 5, mc_full_name: "Patient 5", mc_gender: true, mc_dob: new Date('1964-11-10'), mc_address: "Street 9 home 2 flat 1", mc_phone_num: 4321000})
```

```
db.medical_card.insert({mc_id: 6, mc_full_name: "Patient 6", mc_gender:
false, mc_dob: new Date('1994-09-05'), mc_address: "Street 13 home 1 flat 1",
mc_phone_num: 3432899}))
```

```
db.medical_card.insert({mc_id: 7, mc_full_name: "Patient 7", mc_gender:
false, mc_dob: new Date('1988-12-20'), mc_address: "Street 10 home 1 flat 1",
mc_phone_num: 1532727}))
```

```
db.medical_card.insert({mc_id: 8, mc_full_name: "Patient 8", mc_gender:
false, mc_dob: new Date('1969-01-01'), mc_address: "Street 3 home 1 flat 1",
mc_phone_num: 1532234}))
```

```
db.appointment.insert({a_id: 1, a_doctor: 2, a_patient: 1, a_cabinet: 5, a_date:
new Date('2020-02-01'), a_payment: 1, a_time: "10:00-11:00", a_diagnosis:
"chlamidia", a_recepy: null}))
```

```
db.appointment.insert({a_id: 2, a_doctor: 1, a_patient: 5, a_cabinet: 5, a_date:
new Date('2020-02-02'), a_payment: 2, a_time: "09:30-11:30", a_diagnosis: "de-
pression", a_recepy: "sdshtjtrol"}))
```

```
db.appointment.insert({a_id: 3, a_doctor: 6, a_patient: 2, a_cabinet: 1, a_date:
new Date('2020-02-02'), a_payment: 3, a_time: "10:00-11:00", a_diagnosis: null,
a_recepy: null}))
```

```
db.appointment.insert({a_id: 4, a_doctor: 3, a_patient: 3, a_cabinet: 2, a_date:
new Date('2020-02-03'), a_payment: 4, a_time: "09:30-11:30", a_diagnosis: "mio-
sis", a_recepy: "glasses"}))
```



```
db.appointment.insert({a_id: 5, a_doctor: 5, a_patient: 8, a_cabinet: 8, a_date:
new Date('2020-02-04'), a_payment: 5, a_time: "10:00-11:00", a_diagnosis: "anxi-
ety", a_recepy: "pills"})
```

```
db.appointment.insert({a_id: 6, a_doctor: 8, a_patient: 3, a_cabinet: 4, a_date:
new Date('2020-02-05'), a_payment: 6, a_time: "10:00-11:00", a_diagnosis: "acne",
a_recepy: "cream"})
```

```
db.appointment.insert({a_id: 7, a_doctor: 7, a_patient: 7, a_cabinet: 7, a_date:
new Date('2020-02-05'), a_payment: 7, a_time: "12:00-12:30", a_diagnosis: "mio-
sis", a_recepy: "drops"})
```

```
db.appointment.insert({a_id: 8, a_doctor: 8, a_patient: 3, a_cabinet: 5, a_date:
new Date('2020-02-06'), a_payment: 8, a_time: "11:00-13:00", a_diagnosis: "viti-
ligo", a_recepy: null})
```

```
db.payment.insert({pd_id: 1, p_sum: 1000, p_date_opened: new Date('2020-
02-01'), p_date_closed: new Date('2020-02-01') })
```

```
db.payment.insert({pd_id: 2, p_sum: 3000, p_date_opened: new Date('2020-
02-02'), p_date_closed: new Date('2020-02-05') })
```

```
db.payment.insert({pd_id: 3, p_sum: 500, p_date_opened: new Date('2020-
02-02'), p_date_closed: new Date('2020-02-02') })
```

```
db.payment.insert({pd_id: 4, p_sum: 1000, p_date_opened: new Date('2020-
02-03'), p_date_closed: new Date('2020-02-05') })
```

```
db.payment.insert({pd_id: 5, p_sum: 3000, p_date_opened: new Date('2020-02-04'), p_date_closed: new Date('2020-02-15') })
```

```
db.payment.insert({pd_id: 6, p_sum: 600, p_date_opened: new Date('2020-02-05'), p_date_closed: new Date('2020-02-12') })
```

```
db.payment.insert({pd_id: 7, p_sum: 3000, p_date_opened: new Date('2020-02-05'), p_date_closed: new Date('2020-03-01') })
```

```
db.payment.insert({pd_id: 8, p_sum: 1000, p_date_opened: new Date('2020-02-06'), p_date_closed: null })
```

```
db.schedule.insert({doctor: 1, monday:"08:00-19:00", tuesday: null, wednesday: "10:00-19:00", thursday: null, friday: null, saturday: "08:00-19:00", sunday: null})
```

```
db.schedule.insert({doctor: 2, monday:"11:00-19:00", tuesday: "11:00-19:00", wednesday: "11:00-19:00", thursday: "11:00-19:00", friday: "11:00-19:00", saturday: null, sunday: null})
```

```
db.schedule.insert({doctor: 3, monday:"11:00-19:00", tuesday: "11:00-19:00", wednesday: "11:00-19:00", thursday: "11:00-19:00", friday: "11:00-19:00", saturday: null, sunday: null})
```

```
db.schedule.insert({doctor: 4, monday:"11:00-19:00", tuesday: "11:00-19:00", wednesday: "11:00-19:00", thursday: "11:00-19:00", friday: "11:00-19:00", saturday: null, sunday: null})
```

```
db.schedule.insert({doctor: 5, monday:"11:00-19:00", tuesday: "11:00-19:00", wednesday: "11:00-19:00", thursday: "11:00-19:00", friday: "11:00-19:00", saturday: null, sunday: null})
```

```
db.schedule.insert({doctor: 6, monday:"11:00-19:00", tuesday: "11:00-19:00", wednesday: "11:00-19:00", thursday: "11:00-19:00", friday: "11:00-19:00", saturday: null, sunday: null})
```

```
db.schedule.insert({doctor: 7, monday:"11:00-19:00", tuesday: "11:00-19:00", wednesday: "11:00-19:00", thursday: "11:00-19:00", friday: "11:00-19:00", saturday: null, sunday: null})
```

```
db.schedule.insert({doctor: 8, monday:"08:00-19:00", tuesday: null, wednesday: "10:00-19:00", thursday: null, friday: null, saturday: "08:00-19:00", sunday: null})
```

3) Запросы:

а) Вывести информацию о номере приема и врачах, которые проводили приемы:

```
db.appointment.aggregate([{$lookup: {from: "doctor", localField: "a_doctor", foreignField: "d_id", as: "a_doctor"}},{$project: {"a_id" : 1, "a_doctor" : 1, "d_full_name" : 1, _id: 0}}, {$sort: {"a_id": 1}}])
```

```
db.appointment.aggregate([{$lookup: {from: "doctor", localField: "a_doctor", foreignField: "d_id", as: "a_doctor"}},{$project: {"a_id" : 1, "a_doctor" : 1, "d_full_name" : 1, _id: 0}}, {$sort: {"a_id": 1}}])
{ "a_id" : 1, "a_doctor" : { "id" : ObjectId("5fa18f696ec54ab68c4842b7"), "d_id" : 2, "d_full_name" : "Doctor 2", "d_gender" : false, "d_dob" : ISODate("1983-03-03T00:00:00Z"), "d_education" : "10 years", "d_profession" : "gynecologist", "d_phone_num" : 1234244, "d_address" : "Street 6 home 6 flat 6" } }
{ "a_id" : 2, "a_doctor" : { "id" : ObjectId("5fa18f586ec54ab68c4842b5"), "d_id" : 1, "d_full_name" : "Doctor 1", "d_gender" : true, "d_dob" : ISODate("1978-01-01T00:00:00Z"), "d_education" : "8 years", "d_profession" : "psychologist", "d_phone_num" : 1265522, "d_address" : "Street 5 home 5 flat 5" }, { "id" : ObjectId("5fa18f5f6ec54ab68c4842b6"), "d_id" : 1, "d_full_name" : "Doctor 1", "d_gender" : true, "d_dob" : ISODate("1978-01-01T00:00:00Z"), "d_education" : "8 years", "d_profession" : "psychologist", "d_phone_num" : 1265522, "d_address" : "Street 5 home 5 flat 5" } }
{ "a_id" : 3, "a_doctor" : { "id" : ObjectId("5fa18f846ec54ab68c4842bb"), "d_id" : 6, "d_full_name" : "Doctor 6", "d_gender" : false, "d_dob" : ISODate("1982-03-03T00:00:00Z"), "d_education" : "10 years", "d_profession" : "gynecologist", "d_phone_num" : 1234243, "d_address" : "Street 6 home 6 flat 5" } }
{ "a_id" : 4, "a_doctor" : { "id" : ObjectId("5fa18f706ec54ab68c4842b8"), "d_id" : 3, "d_full_name" : "Doctor 3", "d_gender" : false, "d_dob" : ISODate("1989-04-01T00:00:00Z"), "d_education" : "6 years", "d_profession" : "optometrist", "d_phone_num" : 5623447, "d_address" : "Street 7 home 7 flat 7" } }
{ "a_id" : 5, "a_doctor" : { "id" : ObjectId("5fa18f7b6ec54ab68c4842ba"), "d_id" : 5, "d_full_name" : "Doctor 5", "d_gender" : true, "d_dob" : ISODate("1977-01-01T00:00:00Z"), "d_education" : "8 years", "d_profession" : "psychologist", "d_phone_num" : 1265521, "d_address" : "Street 5 home 5 flat 4" } }
{ "a_id" : 6, "a_doctor" : { "id" : ObjectId("5fa18f906ec54ab68c4842bd"), "d_id" : 8, "d_full_name" : "Doctor 8", "d_gender" : true, "d_dob" : ISODate("1966-09-02T00:00:00Z"), "d_education" : "12 years", "d_profession" : "endocrinologist", "d_phone_num" : 1238898, "d_address" : "Street 8 home 8 flat 7" } }
{ "a_id" : 7, "a_doctor" : { "id" : ObjectId("5fa18f8a6ec54ab68c4842bc"), "d_id" : 7, "d_full_name" : "Doctor 7", "d_gender" : false, "d_dob" : ISODate("1988-04-01T00:00:00Z"), "d_education" : "6 years", "d_profession" : "optometrist", "d_phone_num" : 5623446, "d_address" : "Street 7 home 7 flat 6" } }
{ "a_id" : 8, "a_doctor" : { "id" : ObjectId("5fa18f906ec54ab68c4842bd"), "d_id" : 8, "d_full_name" : "Doctor 8", "d_gender" : true, "d_dob" : ISODate("1966-09-02T00:00:00Z"), "d_education" : "12 years", "d_profession" : "endocrinologist", "d_phone_num" : 1238898, "d_address" : "Street 8 home 8 flat 7" } }
```

б) Вывести информацию о врачах, родившихся в период с 01.01.1980 по 01.01.1990:

```
db.doctor.find({d_dob: {$gte : ISODate('1980-01-01'), $lte:ISODate('1990-01-01')}}), {_id:0}).pretty()
```

```
> db.doctor.find({d_dob: {$gte : ISODate('1980-01-01'), $lte:ISODate('1990-01-01')}}), {_id:0}).pretty()
{
  "d_id" : 2,
  "d_full_name" : "Doctor 2",
  "d_gender" : false,
  "d_dob" : ISODate("1983-03-03T00:00:00Z"),
  "d_education" : "10 years",
  "d_profession" : "gynecologist",
  "d_phone_num" : 1234244,
  "d_address" : "Street 6 home 6 flat 6"
}
{
  "d_id" : 3,
  "d_full_name" : "Doctor 3",
  "d_gender" : false,
  "d_dob" : ISODate("1989-04-01T00:00:00Z"),
  "d_education" : "6 years",
  "d_profession" : "optometrist",
  "d_phone_num" : 5623447,
  "d_address" : "Street 7 home 7 flat 7"
}
{
  "d_id" : 6,
  "d_full_name" : "Doctor 6",
  "d_gender" : false,
  "d_dob" : ISODate("1982-03-03T00:00:00Z"),
  "d_education" : "10 years",
  "d_profession" : "gynecologist",
  "d_phone_num" : 1234243,
  "d_address" : "Street 6 home 6 flat 5"
}
{
  "d_id" : 7,
  "d_full_name" : "Doctor 7",
  "d_gender" : false,
  "d_dob" : ISODate("1988-04-01T00:00:00Z"),
  "d_education" : "6 years",
  "d_profession" : "optometrist",
  "d_phone_num" : 5623446,
  "d_address" : "Street 7 home 7 flat 6"
}
```

в) Вывести информацию о всех пациентах:

```
db.medical_card.find({}, {_id:0})
```

```
> db.medical_card.find({},{_id:0})
{"mc_id" : 1, "mc_full_name" : "Patient 1", "mc_gender" : true, "mc_dob" : ISODate("1990-12-20T00:00:00Z"), "mc_address" : "Street 1 home 1 flat 1", "mc_phone_num" : 1532789 }
{"mc_id" : 2, "mc_full_name" : "Patient 2", "mc_gender" : true, "mc_dob" : ISODate("1990-10-20T00:00:00Z"), "mc_address" : "Street2 home 1 flat 1", "mc_phone_num" : 1532718 }
{"mc_id" : 3, "mc_full_name" : "Patient 3", "mc_gender" : false, "mc_dob" : ISODate("2001-02-20T00:00:00Z"), "mc_address" : "Street 4 home 1 flat 1", "mc_phone_num" : 3445119 }
{"mc_id" : 4, "mc_full_name" : "Patient 4", "mc_gender" : false, "mc_dob" : ISODate("1970-04-13T00:00:00Z"), "mc_address" : "Street 11 home 1 flat 1", "mc_phone_num" : 3482328 }
{"mc_id" : 5, "mc_full_name" : "Patient 5", "mc_gender" : true, "mc_dob" : ISODate("1964-11-10T00:00:00Z"), "mc_address" : "Street 9 home 2 flat 1", "mc_phone_num" : 4321000 }
{"mc_id" : 6, "mc_full_name" : "Patient 6", "mc_gender" : false, "mc_dob" : ISODate("1994-09-05T00:00:00Z"), "mc_address" : "Street 13 home 1 flat 1", "mc_phone_num" : 3432899 }
{"mc_id" : 7, "mc_full_name" : "Patient 7", "mc_gender" : false, "mc_dob" : ISODate("1988-12-20T00:00:00Z"), "mc_address" : "Street 10 home 1 flat 1", "mc_phone_num" : 1532727 }
{"mc_id" : 8, "mc_full_name" : "Patient 8", "mc_gender" : false, "mc_dob" : ISODate("1969-01-01T00:00:00Z"), "mc_address" : "Street 3 home 1 flat 1", "mc_phone_num" : 1532234 }
```

d) Вывести пациентов и их диагнозы:

```
db.appointment.aggregate([{$lookup: {from: "medical_card", localField: "a_patient", foreignField: "mc_id", as: "a_patient"}}, {$project: {"a_patient": 1, "a_diagnosis": 1, "mc_full_name": 1, _id: 0}}, {$sort: {"a_patient": 1}}])
```

```
> db.appointment.aggregate([{$lookup: {from: "medical_card", localField: "a_patient", foreignField: "mc_id", as: "a_patient"}}, {$project: {"a_patient": 1, "a_diagnosis": 1, "mc_full_name": 1, _id: 0}}, {$sort: {"a_patient": 1}}])
{"a_patient": [ { "_id": ObjectId("5fa190796ec54ab68c4842c6"), "mc_id" : 1, "mc_full_name" : "Patient 1", "mc_gender" : true, "mc_dob" : ISODate("1990-12-20T00:00:00Z"), "mc_address" : "Street 1 home 1 flat 1", "mc_phone_num" : 1532789 } ], "a_diagnosis" : "chlamidia" }
{"a_patient": [ { "_id": ObjectId("5fa190806ec54ab68c4842c7"), "mc_id" : 2, "mc_full_name" : "Patient 2", "mc_gender" : true, "mc_dob" : ISODate("1990-10-20T00:00:00Z"), "mc_address" : "Street2 home 1 flat 1", "mc_phone_num" : 1532718 } ], "a_diagnosis" : null }
{"a_patient": [ { "_id": ObjectId("5fa190886ec54ab68c4842c8"), "mc_id" : 3, "mc_full_name" : "Patient 3", "mc_gender" : false, "mc_dob" : ISODate("2001-02-20T00:00:00Z"), "mc_address" : "Street 4 home 1 flat 1", "mc_phone_num" : 3445119 } ], "a_diagnosis" : "miosis" }
{"a_patient": [ { "_id": ObjectId("5fa190886ec54ab68c4842c8"), "mc_id" : 3, "mc_full_name" : "Patient 3", "mc_gender" : false, "mc_dob" : ISODate("2001-02-20T00:00:00Z"), "mc_address" : "Street 4 home 1 flat 1", "mc_phone_num" : 3445119 } ], "a_diagnosis" : "acne" }
{"a_patient": [ { "_id": ObjectId("5fa190886ec54ab68c4842c8"), "mc_id" : 3, "mc_full_name" : "Patient 3", "mc_gender" : false, "mc_dob" : ISODate("2001-02-20T00:00:00Z"), "mc_address" : "Street 4 home 1 flat 1", "mc_phone_num" : 3445119 } ], "a_diagnosis" : "vitiligo" }
{"a_patient": [ { "_id": ObjectId("5fa190956ec54ab68c4842ca"), "mc_id" : 5, "mc_full_name" : "Patient 5", "mc_gender" : true, "mc_dob" : ISODate("1964-11-10T00:00:00Z"), "mc_address" : "Street 9 home 2 flat 1", "mc_phone_num" : 4321000 } ], "a_diagnosis" : "depression" }
{"a_patient": [ { "_id": ObjectId("5fa190a16ec54ab68c4842cc"), "mc_id" : 7, "mc_full_name" : "Patient 7", "mc_gender" : false, "mc_dob" : ISODate("1988-12-20T00:00:00Z"), "mc_address" : "Street 10 home 1 flat 1", "mc_phone_num" : 1532727 } ], "a_diagnosis" : "miosis" }
{"a_patient": [ { "_id": ObjectId("5fa190a76ec54ab68c4842cd"), "mc_id" : 8, "mc_full_name" : "Patient 8", "mc_gender" : false, "mc_dob" : ISODate("1969-01-01T00:00:00Z"), "mc_address" : "Street 3 home 1 flat 1", "mc_phone_num" : 1532234 } ], "a_diagnosis" : "anxiety" }
```

e) Вывести врачей с профессией окулист;

```
db.doctor.find({d_profession: "optometrist"}, {_id:0}).pretty()
```

```
ctor.find({d_profession: "optometrist"}, {_id:0}).pretty()
{"d_id" : 3,
  "d_full_name" : "Doctor 3",
  "d_gender" : false,
  "d_dob" : ISODate("1989-04-01T00:00:00Z"),
  "d_education" : "6 years",
  "d_profession" : "optometrist",
  "d_phone_num" : 5623447,
  "d_address" : "Street 7 home 7 flat 7"

  "d_id" : 7,
  "d_full_name" : "Doctor 7",
  "d_gender" : false,
  "d_dob" : ISODate("1988-04-01T00:00:00Z"),
  "d_education" : "6 years",
  "d_profession" : "optometrist",
  "d_phone_num" : 5623446,
  "d_address" : "Street 7 home 7 flat 6"
```

f) Вывести информацию о наибольшем счете:

```
db.payment.aggregate([{$group: {_id: 0, maxPay: {$min:
"$p_sum"}}}]).pretty()
```

```
> db.payment.aggregate([{$group: {_id: 0, maxPay: {$max: "$p_sum"}}}]).pretty()
{ "_id" : 0, "maxPay" : 3000 }
```

g) Вывести информацию о расписании врачей, имена врачей и их профессии:

```
db.doctor.aggregate([{$lookup: {from: "schedule", localField: "d_id", for-
eignField: "doctor", as: "d_id"}},{$project: {"d_id" : 1, "d_full_name" : 1, "d_pro-
fession" : 1, _id: 0}}, {$sort: {"d_id": 1}}])
```

```
> db.doctor.aggregate([{$lookup: {from: "schedule", localField: "d_id", foreignField: "doctor", as: "d_id"}},{$project: {"d_id" : 1, "d_full_name" : 1, "d_p
rofession" : 1, _id: 0}}, {$sort: {"d_id": 1}}])
{ "d_id" : [ { "_id" : ObjectId("5fa191716ec54ab68c4842de"), "doctor" : 1, "monday" : "08:00-19:00", "tuesday" : null, "wednesday" : "10:00-19:00", "thursday
" : null, "friday" : null, "saturday" : "08:00-19:00", "sunday" : null } ], "d_full_name" : "Doctor 1", "d_profession" : "psychologist" }
{ "d_id" : [ { "_id" : ObjectId("5fa191716ec54ab68c4842de"), "doctor" : 1, "monday" : "08:00-19:00", "tuesday" : null, "wednesday" : "10:00-19:00", "thursday
" : null, "friday" : null, "saturday" : "08:00-19:00", "sunday" : null } ], "d_full_name" : "Doctor 1", "d_profession" : "psychologist" }
{ "d_id" : [ { "_id" : ObjectId("5fa191776ec54ab68c4842df"), "doctor" : 2, "monday" : "11:00-19:00", "tuesday" : "11:00-19:00", "wednesday" : "11:00-19:00",
"thursday" : "11:00-19:00", "friday" : "11:00-19:00", "saturday" : null, "sunday" : null } ], "d_full_name" : "Doctor 2", "d_profession" : "gynecologist" }
{ "d_id" : [ { "_id" : ObjectId("5fa1917d6ec54ab68c4842e0"), "doctor" : 3, "monday" : "11:00-19:00", "tuesday" : "11:00-19:00", "wednesday" : "11:00-19:00",
"thursday" : "11:00-19:00", "friday" : "11:00-19:00", "saturday" : null, "sunday" : null } ], "d_full_name" : "Doctor 3", "d_profession" : "optometrist" }
{ "d_id" : [ { "_id" : ObjectId("5fa191846ec54ab68c4842e1"), "doctor" : 4, "monday" : "11:00-19:00", "tuesday" : "11:00-19:00", "wednesday" : "11:00-19:00",
"thursday" : "11:00-19:00", "friday" : "11:00-19:00", "saturday" : null, "sunday" : null } ], "d_full_name" : "Doctor 4", "d_profession" : "endocrinologist"
}
{ "d_id" : [ { "_id" : ObjectId("5fa191896ec54ab68c4842e2"), "doctor" : 5, "monday" : "11:00-19:00", "tuesday" : "11:00-19:00", "wednesday" : "11:00-19:00",
"thursday" : "11:00-19:00", "friday" : "11:00-19:00", "saturday" : null, "sunday" : null } ], "d_full_name" : "Doctor 5", "d_profession" : "psychologist" }
{ "d_id" : [ { "_id" : ObjectId("5fa1918f6ec54ab68c4842e3"), "doctor" : 6, "monday" : "11:00-19:00", "tuesday" : "11:00-19:00", "wednesday" : "11:00-19:00",
"thursday" : "11:00-19:00", "friday" : "11:00-19:00", "saturday" : null, "sunday" : null } ], "d_full_name" : "Doctor 6", "d_profession" : "gynecologist" }
{ "d_id" : [ { "_id" : ObjectId("5fa191966ec54ab68c4842e4"), "doctor" : 7, "monday" : "11:00-19:00", "tuesday" : "11:00-19:00", "wednesday" : "11:00-19:00",
"thursday" : "11:00-19:00", "friday" : "11:00-19:00", "saturday" : null, "sunday" : null } ], "d_full_name" : "Doctor 7", "d_profession" : "optometrist" }
{ "d_id" : [ { "_id" : ObjectId("5fa1919d6ec54ab68c4842e5"), "doctor" : 8, "monday" : "08:00-19:00", "tuesday" : null, "wednesday" : "10:00-19:00", "thursday
" : null, "friday" : null, "saturday" : "08:00-19:00", "sunday" : null } ], "d_full_name" : "Doctor 8", "d_profession" : "endocrinologist" }
```

ВЫВОД

В лабораторной работе №7 были получены практические навыки создания базы данных в MongoDB, заполнение их рабочими данными и выполнение запросов.