

Министерство науки и высшего образования Российской Федерации
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высшего образования
«НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ
УНИВЕРСИТЕТ ИТМО»
Факультет среднего профессионального образования

ОТЧЁТ
ПО ПРАКТИЧЕСКОЙ 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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Санкт-Петербург 2020

ЦЕЛЬ РАБОТЫ

Цель практической работы №7: овладеть практическими навыками и умениями реализации баз данных в MongoDB.

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.

Примерный набор требуемых запросов:

- a) Вывести кличку и номер документа собак, чей возраст составляет более трех лет;
- b) Вывести паспортные данные и общую информацию о собаке и ее владельце для собак;
- c) Вывести всю информацию о соревнованиях;
- d) Вывести сумму всех инвестиций в соревнованиях;
- e) Вывести спонсоров, инвестировавших больше 10000;
- f) Вывести общую информацию о собаке и ее владельце для собак, состоящих в клубе 'Команда В';
- g) Вывести этапы, на которых участники получили меньше 5 баллов;

ВЫПОЛНЕНИЕ

1) Схема физической модели БД представлена на рисунке №1.

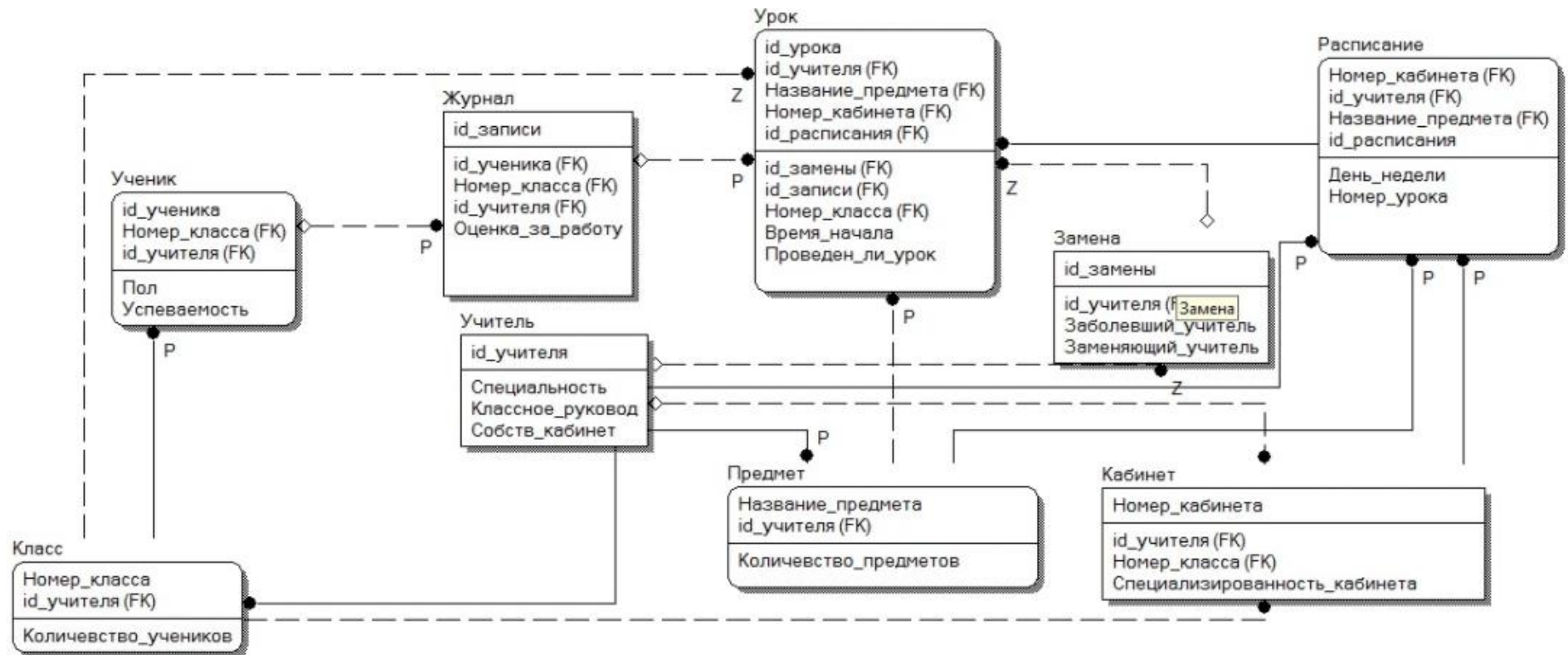


Рисунок 1 Схема инфологической модели данных БД

2) Логи модели:

STUDENTS

```
db.Students.insertOne({"id_student":1,  
"class_number":5,  
"id_teacher":1,  
"gender":"male",  
"academic_performance":10})
```

```
db.Students.insertOne({"id_student":2,  
"class_number":5,  
"id_teacher":1,  
"gender":"female",  
"academic_performance":9})
```

```
db.Students.insertOne({"id_student":3,  
"class_number":6,  
"id_teacher":3,  
"gender":"male",  
"academic_performance":8})
```

```
db.Students.insertOne({"id_student":4,  
"class_number":6,  
"id_teacher":3,  
"gender":"male",  
"academic_performance":8})
```

```
db.Students.insertOne({"id_student":5,  
"class_number":2,  
"id_teacher":5,
```

```
"gender":"female",  
"academic_performance":7}}
```

```
db.Students.insertOne({"id_student":6,  
"class_number":2,  
"id_teacher":5,  
"gender":"female",  
"academic_performance":10}}
```

```
> db.Students.find().pretty()  
{  
  "_id" : ObjectId("5fa4349d7e0a47a6b884df95"),  
  "id_student" : 1,  
  "class_number" : 5,  
  "id_teacher" : 1,  
  "gender" : "male",  
  "academic_performance" : 10  
}  
{  
  "_id" : ObjectId("5fa435717e0a47a6b884df96"),  
  "id_student" : 2,  
  "class_number" : 5,  
  "id_teacher" : 1,  
  "gender" : "female",  
  "academic_performance" : 9  
}  
{  
  "_id" : ObjectId("5fa4359a7e0a47a6b884df97"),  
  "id_student" : 3,  
  "class_number" : 6,  
  "id_teacher" : 3,  
  "gender" : "male",  
  "academic_performance" : 8  
}  
{  
  "_id" : ObjectId("5fa435de7e0a47a6b884df98"),  
  "id_student" : 4,  
  "class_number" : 6,  
  "id_teacher" : 3,  
  "gender" : "male",  
  "academic_performance" : 8  
}  
{  
  "_id" : ObjectId("5fa435f77e0a47a6b884df99"),  
  "id_student" : 5,  
  "class_number" : 2,  
  "id_teacher" : 5,  
  "gender" : "female",  
  "academic_performance" : 7  
}  
{  
  "_id" : ObjectId("5fa436107e0a47a6b884df9a"),  
  "id_student" : 6,  
  "class_number" : 2,  
  "id_teacher" : 5,  
  "gender" : "female",  
  "academic_performance" : 10  
}  
> -
```

TEACHERS

```
db.Teachers.insertMany([
  {"id_teacher":1,
   "specialty":"math",
   "class_leadership":true,
   "own_cabinet":0},
  {"id_teacher":2,
   "specialty":"literature",
   "class_leadership":false,
   "own_cabinet":1},
  {"id_teacher":3,
   "specialty":"english",
   "class_leadership":true,
   "own_cabinet":0},
  {"id_teacher":4,
   "specialty":"biology",
   "class_leadership":false,
   "own_cabinet":1},
  {"id_teacher":5,
   "specialty":"chemistry",
   "class_leadership":true,
   "own_cabinet":1},
])
```

CABINETS

```
db.Cabinets.insertMany([
{
```



```
"number_of_cabinet":123,  
"id_teacher":2,  
"id_class":null,  
"cabinet_specialty":"Literature"  
},  
{  
"number_of_cabinet":124,  
"id_teacher":2,  
"id_class":null,  
"cabinet_specialty":"Russian"  
},  
{  
"number_of_cabinet":125,  
"id_teacher":4,  
"id_class":null,  
"cabinet_specialty":"Biology"  
},  
{  
"number_of_cabinet":126,  
"id_teacher":5,  
"id_class":2,  
"cabinet_specialty":"Chemestry"  
}  
])
```

```

> db.Teachers.find().pretty()
{
  "_id" : ObjectId("5fa4396d7e0a47a6b884df9b"),
  "id_teacher" : 1,
  "specialty" : "math",
  "class_leadership" : true,
  "own_cabinet" : 0
}

{
  "_id" : ObjectId("5fa4396d7e0a47a6b884df9c"),
  "id_teacher" : 2,
  "specialty" : "literature",
  "class_leadership" : false,
  "own_cabinet" : 1
}

{
  "_id" : ObjectId("5fa4396d7e0a47a6b884df9d"),
  "id_teacher" : 3,
  "specialty" : "english",
  "class_leadership" : true,
  "own_cabinet" : 0
}

{
  "_id" : ObjectId("5fa4396d7e0a47a6b884df9e"),
  "id_teacher" : 4,
  "specialty" : "biology",
  "class_leadership" : false,
  "own_cabinet" : 1
}

{
  "_id" : ObjectId("5fa4396d7e0a47a6b884df9f"),
  "id_teacher" : 5,
  "specialty" : "chemistry",
  "class_leadership" : true,
  "own_cabinet" : 1
}

```

CLASS

```

db.Class.insertMany([
  {
    "class_number":2,
    "id_teacher":5,
    "number_of_students":2
  },
  {
    "class_number":5,

```

```

    "id_teacher":1,
    "number_of_students":2
  },
  {
    "class_number":6,
    "id_teacher":3,
    "number_of_students":2
  },
]

```

```

> db.Class.find().pretty()
{
  "_id" : ObjectId("5fa43d197e0a47a6b884dfa4"),
  "class_number" : 2,
  "id_teacher" : 5,
  "number_of_students" : 2
}
{
  "_id" : ObjectId("5fa43d197e0a47a6b884dfa5"),
  "class_number" : 5,
  "id_teacher" : 1,
  "number_of_students" : 2
}
{
  "_id" : ObjectId("5fa43d197e0a47a6b884dfa6"),
  "class_number" : 6,
  "id_teacher" : 3,
  "number_of_students" : 2
}
> _

```

BOOK

```

db.Book.insertMany([
  {
    "id_note":456,
    "id_student":1,
    "class_number":5,
    "id_teacher":1,
    "work_grade":5
  }
])

```

```
},  
{  
  "id_note":457,  
  "id_student":2,  
  "class_number":5,  
  "id_teacher":1,  
  "work_grade":4  
},  
{  
  "id_note":458,  
  "id_student":3,  
  "class_number":6,  
  "id_teacher":3,  
  "work_grade":3  
},  
{  
  "id_note":459,  
  "id_student":4,  
  "class_number":6,  
  "id_teacher":3,  
  "work_grade":5  
},  
{  
  "id_note":460,  
  "id_student":5,  
  "class_number":2,  
  "id_teacher":5,  
  "work_grade":5  
},  
{
```

```
"id_note":461,  
"id_student":6,  
"class_number":2,  
"id_teacher":5,  
"work_grade":3  
},  
])
```

```
> db.Book.find().pretty()  
{  
  "_id" : ObjectId("5fa44102a2e06d305518cf6f"),  
  "id_note" : 456,  
  "id_student" : 1,  
  "class_number" : 5,  
  "id_teacher" : 1,  
  "work_grade" : 5  
}  
{  
  "_id" : ObjectId("5fa44102a2e06d305518cf70"),  
  "id_note" : 457,  
  "id_student" : 2,  
  "class_number" : 5,  
  "id_teacher" : 1,  
  "work_grade" : 4  
}  
{  
  "_id" : ObjectId("5fa44102a2e06d305518cf71"),  
  "id_note" : 458,  
  "id_student" : 3,  
  "class_number" : 6,  
  "id_teacher" : 3,  
  "work_grade" : 3  
}  
{  
  "_id" : ObjectId("5fa44102a2e06d305518cf72"),  
  "id_note" : 459,  
  "id_student" : 4,  
  "class_number" : 6,  
  "id_teacher" : 3,  
  "work_grade" : 5  
}  
{  
  "_id" : ObjectId("5fa44102a2e06d305518cf73"),  
  "id_note" : 460,  
  "id_student" : 5,  
  "class_number" : 2,  
  "id_teacher" : 5,  
  "work_grade" : 5  
}  
{  
  "_id" : ObjectId("5fa44102a2e06d305518cf74"),  
  "id_note" : 461,  
  "id_student" : 6,  
  "class_number" : 2,  
  "id_teacher" : 5,  
  "work_grade" : 3  
}  
>
```

LESSON

```
db.Lessons.insertMany([
  {
    "id_lesson":991,
    "id_teacher":2,
    "subject_name":"Russian",
    "number_of_cabinet":123,
    "id_timetable":445,
    "id_replacement":657,
    "id_note":null,
    "class_number":2,
    "time_start":new Date('2020-01-08 09:00:00'),
  },
  {
    "id_lesson":992,
    "id_teacher":2,
    "subject_name":"Literature",
    "number_of_cabinet":124,
    "id_timetable":446,
    "id_replacement":null,
    "id_note":null,
    "class_number":6,
    "time_start":new Date('2020-01-09 10:00:00'),
  },
  {
    "id_lesson":993,
    "id_teacher":4,
    "subject_name":"Biology",
```

```

"number_of_cabinet":125,
"id_timetable":447,
"id_replacement":660,
"id_note":null,
"class_number":5,
"time_start":new Date('2020-01-10 11:00:00'),
},
{
"id_lesson":994,
"id_teacher":5,
"subject_name":"Chemestry",
"number_of_cabinet":126,
"id_timetable":448,
"id_replacement":659,
"id_note":461,
"class_number":2,
"time_start":new Date('2020-01-11 12:00:00'),
},
{
"id_lesson":995,
"id_teacher":1,
"subject_name":"Math",
"number_of_cabinet":126,
"id_timetable":449,
"id_replacement":null,
"id_note":456,
"class_number":5,
"time_start":new Date('2020-01-12 13:00:00'),
},
{

```

```
"id_lesson":996,  
"id_teacher":3,  
"subject_name":"English",  
"number_of_cabinet":124,  
"id_timetable":500,  
"id_replacement":null,  
"id_note":458,  
"class_number":6,  
"time_start":new Date('2020-01-13 14:00:00'),  
},  
{  
"id_lesson":997,  
"id_teacher":2,  
"subject_name":"Russian",  
"number_of_cabinet":123,  
"id_timetable":446,  
"id_replacement":657,  
"id_note":456,  
"class_number":2,  
"time_start":new Date('2020-01-12 12:00:00'),  
},  
{  
"id_lesson":998,  
"id_teacher":2,  
"subject_name":"Literature",  
"number_of_cabinet":124,  
"id_timetable":447,  
"id_replacement":null,  
"id_note":null,  
"class_number":6,
```



```
"time_start":new Date('2020-01-13 12:00:00'),  
},  
{  
  "id_lesson":999,  
  "id_teacher":4,  
  "subject_name":"Biology",  
  "number_of_cabinet":125,  
  "id_timetable":447,  
  "id_replacement":null,  
  "id_note":null,  
  "class_number":5,  
  "time_start":new Date('2020-01-15 12:00:00'),  
},  
])
```

```

db.Lessons.find().pretty()
{
  "_id" : ObjectId("5fa445efa2e06d305518cf75"),
  "id_lesson" : 991,
  "id_teacher" : 2,
  "subject_name" : "Russian",
  "number_of_cabinet" : 123,
  "id_timetable" : 445,
  "id_replacement" : 657,
  "id_note" : null,
  "class_number" : 2,
  "time_start" : ISODate("2020-01-08T06:00:00Z")
}
{
  "_id" : ObjectId("5fa445efa2e06d305518cf76"),
  "id_lesson" : 992,
  "id_teacher" : 2,
  "subject_name" : "Literature",
  "number_of_cabinet" : 124,
  "id_timetable" : 446,
  "id_replacement" : null,
  "id_note" : null,
  "class_number" : 6,
  "time_start" : ISODate("2020-01-09T07:00:00Z")
}
{
  "_id" : ObjectId("5fa445efa2e06d305518cf77"),
  "id_lesson" : 993,
  "id_teacher" : 4,
  "subject_name" : "Biology",
  "number_of_cabinet" : 125,
  "id_timetable" : 447,
  "id_replacement" : 660,
  "id_note" : null,
  "class_number" : 5,
  "time_start" : ISODate("2020-01-10T08:00:00Z")
}
{
  "_id" : ObjectId("5fa445efa2e06d305518cf78"),
  "id_lesson" : 994,
  "id_teacher" : 5,
  "subject_name" : "Chemestry",
  "number_of_cabinet" : 126,
  "id_timetable" : 448,
  "id_replacement" : 659,
  "id_note" : 461,
  "class_number" : 2,
  "time_start" : ISODate("2020-01-11T09:00:00Z")
}
{
  "_id" : ObjectId("5fa445efa2e06d305518cf79"),
  "id_lesson" : 995,
  "id_teacher" : 1,
  "subject_name" : "Math",
  "number_of_cabinet" : 126,
  "id_timetable" : 449,
  "id_replacement" : null,
  "id_note" : 456,
  "class_number" : 5,
  "time_start" : ISODate("2020-01-12T10:00:00Z")
}
{
  "_id" : ObjectId("5fa445efa2e06d305518cf7a"),
  "id_lesson" : 996,
  "id_teacher" : 3,
  "subject_name" : "English",
  "number_of_cabinet" : 124,
  "id_timetable" : 500,
  "id_replacement" : null,
  "id_note" : 458,
  "class_number" : 6,
  "time_start" : ISODate("2020-01-13T11:00:00Z")
}
{
  "_id" : ObjectId("5fa445efa2e06d305518cf7b"),
  "id_lesson" : 997,
  "id_teacher" : 2,
  "subject_name" : "Russian",
  "number_of_cabinet" : 123,
  "id_timetable" : 446,
  "id_replacement" : 657,
  "id_note" : 456,
  "class_number" : 2,
  "time_start" : ISODate("2020-01-12T09:00:00Z")
}
{
  "_id" : ObjectId("5fa445efa2e06d305518cf7c"),
  "id_lesson" : 998,
  "id_teacher" : 2,
  "subject_name" : "Literature",
  "number_of_cabinet" : 124,
  "id_timetable" : 447,
  "id_replacement" : null,
  "id_note" : null,
  "class_number" : 6,
  "time_start" : ISODate("2020-01-13T09:00:00Z")
}
{
  "_id" : ObjectId("5fa445efa2e06d305518cf7d"),
  "id_lesson" : 999,
  "id_teacher" : 4,
  "subject_name" : "Biology",
  "number_of_cabinet" : 125,
  "id_timetable" : 447,
  "id_replacement" : null,
  "id_note" : null,
  "class_number" : 5,
  "time_start" : ISODate("2020-01-15T09:00:00Z")
}
}

```

REPLACEMENT

```
db.Replacement.insertMany([
  {
    "id_replacement":656,
    "replacing_teacher":2,
    "sick_teacher":1
  },
  {
    "id_replacement":657,
    "replacing_teacher":3,
    "sick_teacher":2
  },
  {
    "id_replacement":658,
    "replacing_teacher":2,
    "sick_teacher":3
  },
  {
    "id_replacement":659,
    "replacing_teacher":4,
    "sick_teacher":5
  },
  {
    "id_replacement":660,
    "replacing_teacher":5,
    "sick_teacher":4
  },
])
```

```

> db.Replacement.find().pretty()
{
  "_id" : ObjectId("5fa44aeca2e06d305518cf7e"),
  "id_replacement" : 656,
  "replacing_teacher" : 2,
  "sick_teacher" : 1
}
{
  "_id" : ObjectId("5fa44aeca2e06d305518cf7f"),
  "id_replacement" : 657,
  "replacing_teacher" : 3,
  "sick_teacher" : 2
}
{
  "_id" : ObjectId("5fa44aeca2e06d305518cf80"),
  "id_replacement" : 658,
  "replacing_teacher" : 2,
  "sick_teacher" : 3
}
{
  "_id" : ObjectId("5fa44aeca2e06d305518cf81"),
  "id_replacement" : 659,
  "replacing_teacher" : 4,
  "sick_teacher" : 5
}
{
  "_id" : ObjectId("5fa44aeca2e06d305518cf82"),
  "id_replacement" : 660,
  "replacing_teacher" : 5,
  "sick_teacher" : 4
}
>

```

SUBJECT

```

db.Subjects.insertMany([
{
  "subject_name": "Biology",
  "id_teacher": 4,
  "number_of_subjects": 1
},
{
  "subject_name": "Chemestry",
  "id_teacher": 5,
  "number_of_subjects": 2
}
])

```

```
},
{
  "subject_name": "English",
  "id_teacher": 3,
  "number_of_subjects": 2
},
{
  "subject_name": "Literature",
  "id_teacher": 2,
  "number_of_subjects": 4
},
{
  "subject_name": "Math",
  "id_teacher": 1,
  "number_of_subjects": 5
},
{
  "subject_name": "Russian",
  "id_teacher": 2,
  "number_of_subjects": 3
},
])
```

```

> db.Subjects.find().pretty()
{
  "_id" : ObjectId("5fa44dd7a2e06d305518cf83"),
  "subject_name" : "Biology",
  "id_teacher" : 4,
  "number_of_subjects" : 1
}
{
  "_id" : ObjectId("5fa44dd7a2e06d305518cf84"),
  "subject_name" : "Chemestry",
  "id_teacher" : 5,
  "number_of_subjects" : 2
}
{
  "_id" : ObjectId("5fa44dd7a2e06d305518cf85"),
  "subject_name" : "English",
  "id_teacher" : 3,
  "number_of_subjects" : 2
}
{
  "_id" : ObjectId("5fa44dd7a2e06d305518cf86"),
  "subject_name" : "Literature",
  "id_teacher" : 2,
  "number_of_subjects" : 4
}
{
  "_id" : ObjectId("5fa44dd7a2e06d305518cf87"),
  "subject_name" : "Math",
  "id_teacher" : 1,
  "number_of_subjects" : 5
}
{
  "_id" : ObjectId("5fa44dd7a2e06d305518cf88"),
  "subject_name" : "Russian",
  "id_teacher" : 2,
  "number_of_subjects" : 3
}

```

TIMETABLE

```

db.Timetable.insertMany([
{
  "number_of_cabinet":123,
  "id_teacher":2,
  "id_timetable":445,
  "day_of_the_week": new Date('2020-01-08'),
  "lesson_number":1,

```

```

"subject_name":"Russian"
},
{
"number_of_cabinet":124,
"id_teacher":2,
"id_timetable":446,
"day_of_the_week": new Date('2020-01-09'),
"lesson_number":2,
"subject_name":"Literature"
},
{
"number_of_cabinet":125,
"id_teacher":4,
"id_timetable":447,
"day_of_the_week": new Date('2020-01-10'),
"lesson_number":3,
"subject_name":"Biology"
},
{
"number_of_cabinet":126,
"id_teacher":5,
"id_timetable":448,
"day_of_the_week": new Date('2020-01-11'),
"lesson_number":4,
"subject_name":"Chemestry"
},
{
"number_of_cabinet":126,
"id_teacher":1,
"id_timetable":449,

```

```
"day_of_the_week": new Date('2020-01-12'),  
"lesson_number":5,  
"subject_name":"Math"  
},  
{  
"number_of_cabinet":124,  
"id_teacher":3,  
"id_timetable":500,  
"day_of_the_week": new Date('2020-01-13'),  
"lesson_number":6,  
"subject_name":"English"  
},  
])
```



```

> db.Timetable.find().pretty()
{
  "_id" : ObjectId("5fa450bba2e06d305518cf89"),
  "number_of_cabinet" : 123,
  "id_teacher" : 2,
  "id_timetable" : 445,
  "day_of_the_week" : ISODate("2020-01-08T00:00:00Z"),
  "lesson_number" : 1,
  "subject_name" : "Russian"
}
{
  "_id" : ObjectId("5fa450bba2e06d305518cf8a"),
  "number_of_cabinet" : 124,
  "id_teacher" : 2,
  "id_timetable" : 446,
  "day_of_the_week" : ISODate("2020-01-09T00:00:00Z"),
  "lesson_number" : 2,
  "subject_name" : "Literature"
}
{
  "_id" : ObjectId("5fa450bba2e06d305518cf8b"),
  "number_of_cabinet" : 125,
  "id_teacher" : 4,
  "id_timetable" : 447,
  "day_of_the_week" : ISODate("2020-01-10T00:00:00Z"),
  "lesson_number" : 3,
  "subject_name" : "Biology"
}
{
  "_id" : ObjectId("5fa450bba2e06d305518cf8c"),
  "number_of_cabinet" : 126,
  "id_teacher" : 5,
  "id_timetable" : 448,
  "day_of_the_week" : ISODate("2020-01-11T00:00:00Z"),
  "lesson_number" : 4,
  "subject_name" : "Chemestry"
}
{
  "_id" : ObjectId("5fa450bba2e06d305518cf8d"),
  "number_of_cabinet" : 126,
  "id_teacher" : 1,
  "id_timetable" : 449,
  "day_of_the_week" : ISODate("2020-01-12T00:00:00Z"),
  "lesson_number" : 5,
  "subject_name" : "Math"
}
{
  "_id" : ObjectId("5fa450bba2e06d305518cf8e"),
  "number_of_cabinet" : 124,
  "id_teacher" : 3,
  "id_timetable" : 500,
  "day_of_the_week" : ISODate("2020-01-13T00:00:00Z"),
  "lesson_number" : 6,
  "subject_name" : "English"
}

```

3) Запросы:

a) Вывести id всех девочек:

```
db.Students.find({"gender":"female"}, {"id_student":true, _id:0})
```

```
> db.Students.find({"gender":"female"}, {"id_student":true, _id:0})
{ "id_student" : 2 }
{ "id_student" : 5 }
{ "id_student" : 6 }
>
```

b) Вывести студентов, которые получили оценку выше 3 баллов:

```
db.Book.find({"work_grade":{$gt:3}}, {"id_student":true, _id:0,
                                     "work_grade":true})
```

```
> db.Book.find({"work_grade":{$gt:3}}, {"id_student":true, _id:0, "work_grade":true})
{ "id_student" : 1, "work_grade" : 5 }
{ "id_student" : 2, "work_grade" : 4 }
{ "id_student" : 4, "work_grade" : 5 }
{ "id_student" : 5, "work_grade" : 5 }
>
```

c) Вывести названия проведенных уроков преподавателя под id 2:

```
db.Lessons.find({"id_teacher":2}, {"subject_name":true, _id:0})
```

```
> db.Lessons.find({"id_teacher":2}, {"subject_name":true, _id:0})
{ "subject_name" : "Russian" }
{ "subject_name" : "Literature" }
{ "subject_name" : "Russian" }
{ "subject_name" : "Literature" }
> _
```

d) Вывести академическую успеваемость всех учеников:

```
db.Students.aggregate([{$group: {_id: 0, "academic_performance": {$avg: "$academic_performance"}}}])
```

```
> db.Students.aggregate([{$group: {_id: 0, "academic_performance": {$avg: "$academic_performance"}}}])
{ "_id" : 0, "academic_performance" : 8.666666666666666 }
> _
```

ВЫВОД

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