Нереляционные базы данных

Лабораторная работа 3

Курсоры

Задания к лабораторной работе

1. Проведите 4 выборки данных, используя включение, исключение полей и индексов. Убедитесь, что только индекс может быть исключен при включении полей.

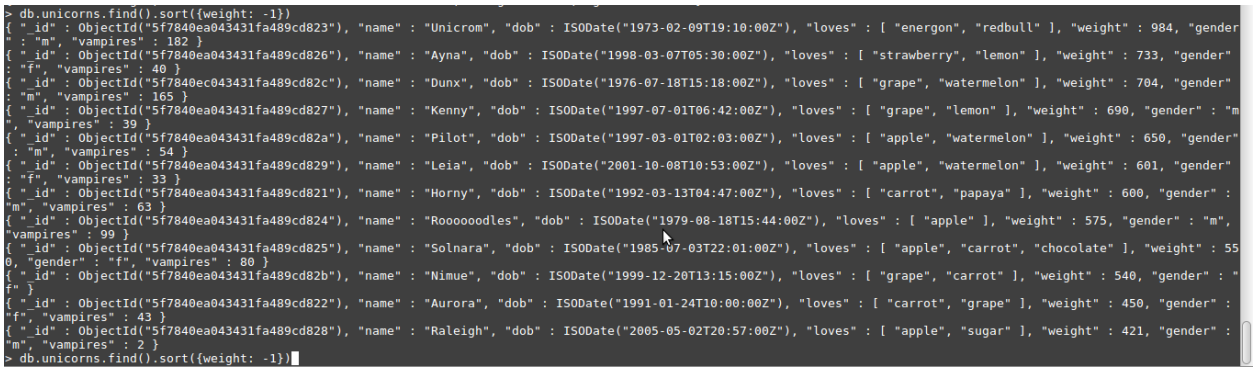
```
> db.unicorns.find(null, {name: 1, _id: 0, gender: 1});
{ "name" : "Horny", "gender" : "m" }
{ "name" : "Aurora", "gender" : "f" }
{ "name" : "Unicrom", "gender" : "m" }
{ "name" : "Roooooodles", "gender" : "m" }
{ "name" : "Solnara", "gender" : "f" }
{ "name" : "Ayna", "gender" : "f" }
{ "name" : "Kenny", "gender" : "m" }
{ "name" : "Raleigh", "gender" : "m" }
{ "name" : "Leia", "gender" : "f" }
{ "name" : "Pilot", "gender" : "m" }
{ "name" : "Nimue", "gender" : "f" }
{ "name" : "Dunx", "gender" : "m" }
>
```

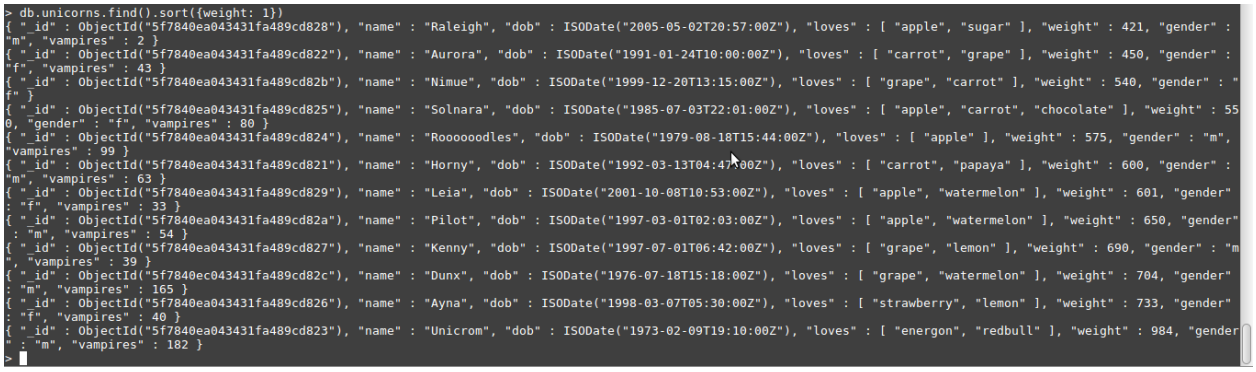
```
> db.unicorns.find(null, {name: 1, _id: 0, gender: 0});
error: {
        "$err" : "Can't canonicalize query: BadValue Projection cannot have a mix of inclusion and exclusion.",
        "code" : 17287
}
>
```

```
> db.unicorns.find(null, {name: 1, gender: 1});
{ "_id" : ObjectId("5f7840ea043431fa489cd821"), "name" : "Horny", "gender" : "m" }
{ "_id" : ObjectId("5f7840ea043431fa489cd822"), "name" : "Aurora", "gender" : "f" }
{ "_id" : ObjectId("5f7840ea043431fa489cd823"), "name" : "Unicrom", "gender" : "m" }
{ "_id" : ObjectId("5f7840ea043431fa489cd824"), "name" : "Roooooodles", "gender" : "m" }
{ "_id" : ObjectId("5f7840ea043431fa489cd825"), "name" : "Solnara", "gender" : "f" }
{ "_id" : ObjectId("5f7840ea043431fa489cd826"), "name" : "Ayna", "gender" : "f" }
{ "_id" : ObjectId("5f7840ea043431fa489cd827"), "name" : "Kenny", "gender" : "m" }
{ "_id" : ObjectId("5f7840ea043431fa489cd828"), "name" : "Raleigh", "gender" : "m" }
{ "_id" : ObjectId("5f7840ea043431fa489cd829"), "name" : "Leia", "gender" : "f" }
{ "_id" : ObjectId("5f7840ea043431fa489cd82a"), "name" : "Pilot", "gender" : "m" }
{ "_id" : ObjectId("5f7840ea043431fa489cd82b"), "name" : "Nimue", "gender" : "f" }
{ "_id" : ObjectId("5f7840ec043431fa489cd82c"), "name" : "Dunx", "gender" : "m" }
>
```

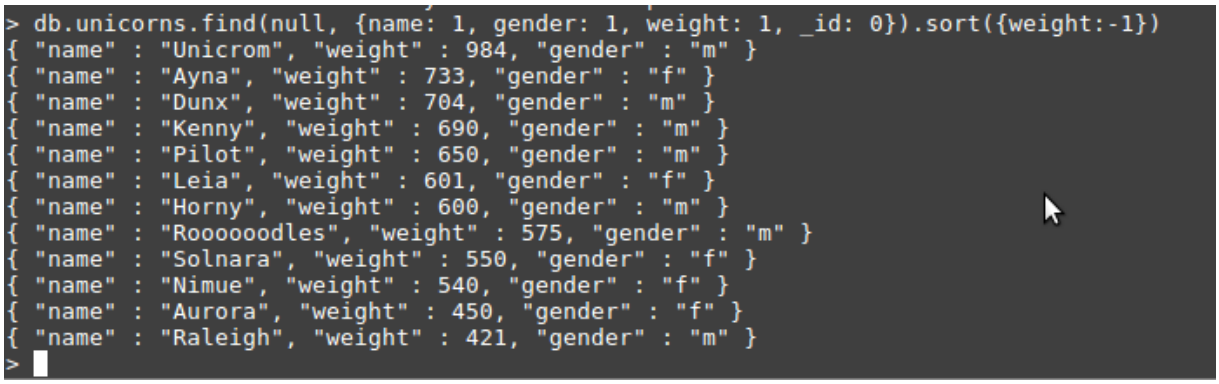
```
> db.unicorns.find(null, {name: 1, gender: 1, weight: 1, _id: 0});
{ "name" : "Horny", "weight" : 600, "gender" : "m" }
{ "name" : "Aurora", "weight" : 450, "gender" : "f" }
{ "name" : "Unicrom", "weight" : 984, "gender" : "m" }
{ "name" : "Roooooodles", "weight" : 575, "gender" : "m" }
{ "name" : "Solnara", "weight" : 550, "gender" : "f" }
{ "name" : "Ayna", "weight" : 733, "gender" : "f" }
{ "name" : "Kenny", "weight" : 690, "gender" : "m" }
{ "name" : "Raleigh", "weight" : 421, "gender" : "m" }
{ "name" : "Leia", "weight" : 601, "gender" : "f" }
{ "name" : "Pilot", "weight" : 650, "gender" : "m" }
{ "name" : "Nimue", "weight" : 540, "gender" : "f" }
{ "name" : "Dunx", "weight" : 704, "gender" : "m" }
>
```

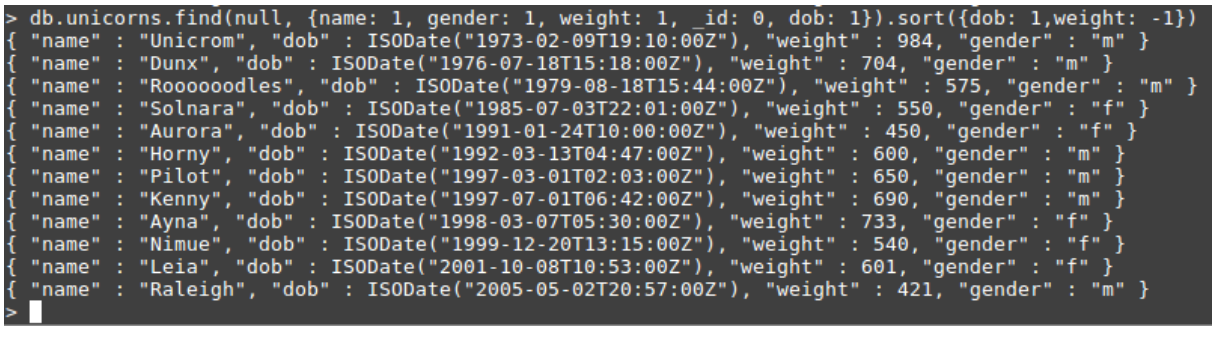
2. Проведите 2 выборки данных, используя сортировку по убыванию и по возрастанию





3. Проведите 3 выборки данных, используя различные комбинации сортировки по полям.





```
> db.unicorns.find(null, {name: 1, gender: 1, weight: 1, _id: 0, dob: 1}).sort({dob: 1})
{ "name" : "Unicrom", "dob" : ISODate("1973-02-09T19:10:00Z"), "weight" : 984, "gender" : "m" }
{ "name" : "Dunx", "dob" : ISODate("1976-07-18T15:18:00Z"), "weight" : 704, "gender" : "m" }
{ "name" : "Roooooodles", "dob" : ISODate("1979-08-18T15:44:00Z"), "weight" : 575, "gender" : "m" }
{ "name" : "Solnara", "dob" : ISODate("1985-07-03T22:01:00Z"), "weight" : 550, "gender" : "f" }
{ "name" : "Aurora", "dob" : ISODate("1991-01-24T10:00:00Z"), "weight" : 450, "gender" : "f" }
{ "name" : "Horny", "dob" : ISODate("1992-03-13T04:47:00Z"), "weight" : 600, "gender" : "m" }
{ "name" : "Pilot", "dob" : ISODate("1997-03-01T02:03:00Z"), "weight" : 650, "gender" : "m" }
{ "name" : "Kenny", "dob" : ISODate("1997-07-01T06:42:00Z"), "weight" : 690, "gender" : "m" }
{ "name" : "Ayna", "dob" : ISODate("1998-03-07T05:30:00Z"), "weight" : 733, "gender" : "f" }
{ "name" : "Nimue", "dob" : ISODate("1999-12-20T13:15:00Z"), "weight" : 540, "gender" : "f" }
{ "name" : "Leia", "dob" : ISODate("2001-10-08T10:53:00Z"), "weight" : 601, "gender" : "f" }
{ "name" : "Raleigh", "dob" : ISODate("2005-05-02T20:57:00Z"), "weight" : 421, "gender" : "m" }
>
```

4. Проведите следующие выборки для коллекции из ка минимум шести элементов: первые пять элементов; все элементы, начиная с четвертого; элементы с третьего по пятый.

```
>
> db.unicorns.find(null, {name: 1, gender: 1, weight: 1, _id: 0, dob: 1}).sort({weight: -1}).limit(5)
{ "name" : "Unicrom", "dob" : ISODate("1973-02-09T19:10:00Z"), "weight" : 984, "gender" : "m" }
{ "name" : "Ayna", "dob" : ISODate("1998-03-07T05:30:00Z"), "weight" : 733, "gender" : "f" }
{ "name" : "Dunx", "dob" : ISODate("1976-07-18T15:18:00Z"), "weight" : 704, "gender" : "m" }
{ "name" : "Kenny", "dob" : ISODate("1997-07-01T06:42:00Z"), "weight" : 690, "gender" : "m" }
{ "name" : "Pilot", "dob" : ISODate("1997-03-01T02:03:00Z"), "weight" : 650, "gender" : "m" }
>
>
> db.unicorns.find(null, {name: 1, gender: 1, weight: 1, _id: 0, dob: 1}).sort({weight: -1}).skip(3)
{ "name" : "Kenny", "dob" : ISODate("1997-07-01T06:42:00Z"), "weight" : 690, "gender" : "m" }
{ "name" : "Pilot", "dob" : ISODate("1997-03-01T02:03:00Z"), "weight" : 650, "gender" : "m" }
{ "name" : "Leia", "dob" : ISODate("2001-10-08T10:53:00Z"), "weight" : 601, "gender" : "f" }
{ "name" : "Horny", "dob" : ISODate("1992-03-13T04:47:00Z"), "weight" : 600, "gender" : "m" }
{ "name" : "Roooooodles", "dob" : ISODate("1979-08-18T15:44:00Z"), "weight" : 575, "gender" : "m" }
{ "name" : "Solnara", "dob" : ISODate("1985-07-03T22:01:00Z"), "weight" : 550, "gender" : "f" }
{ "name" : "Nimue", "dob" : ISODate("1999-12-20T13:15:00Z"), "weight" : 540, "gender" : "f" }
{ "name" : "Aurora", "dob" : ISODate("1991-01-24T10:00:00Z"), "weight" : 450, "gender" : "f" }
{ "name" : "Raleigh", "dob" : ISODate("2005-05-02T20:57:00Z"), "weight" : 421, "gender" : "m" }
>
>
> db.unicorns.find(null, {name: 1, gender: 1, weight: 1, _id: 0, dob: 1}).sort({weight: -1}).skip(2).limit(3)
{ "name" : "Dunx", "dob" : ISODate("1976-07-18T15:18:00Z"), "weight" : 704, "gender" : "m" }
{ "name" : "Kenny", "dob" : ISODate("1997-07-01T06:42:00Z"), "weight" : 690, "gender" : "m" }
{ "name" : "Pilot", "dob" : ISODate("1997-03-01T02:03:00Z"), "weight" : 650, "gender" : "m" }
>
```

5. Посчитайте число элементов в каждой выборке задания 4. Убедитесь, что записи count(условие) и find(условие).count() равнозначны.

```
> db.unicorns.count({weight: {$gt:600}})
6
> db.unicorns.find({weight: {$gt:600}}).count()
6
>
```

6. Создайте коллекцию с 5-10 документами вида {number: <положительное, отрицательное число или ноль>}, с помощью функции forEach посчитайте сумму положительных элементов, количество четных элементов и произведение ненулевых элементов.

```
> db.nums.find()
{ "_id" : ObjectId("5f784b002105127a8b7f2524"), "numbers" : 5 }
{ "_id" : ObjectId("5f784b072105127a8b7f2525"), "numbers" : -15 }
{ "_id" : ObjectId("5f784b0c2105127a8b7f2526"), "numbers" : 0 }
{ "_id" : ObjectId("5f784b112105127a8b7f2527"), "numbers" : 17 }
{ "_id" : ObjectId("5f784b192105127a8b7f2528"), "numbers" : -20 }
{ "_id" : ObjectId("5f784b212105127a8b7f2529"), "numbers" : -7 }
{ "_id" : ObjectId("5f784b292105127a8b7f252a"), "numbers" : 29 }
>
```

```
> var a=0
> var b=0
> var c=0
> db.nums.find().forEach(function(doc) {if(doc.numbers>0) a+=doc.numbers;})
> a
51
>
```

```
> c=1
1
> db.nums.find().forEach(function(doc) {if(doc.numbers!=0) c*=doc.numbers;})
> c
-5176500
>
```