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Факультет инфокоммуникационных технологий

ЛАБОРАТОРНАЯ РАБОТА №5.2

Работа с БД в СУБД MongoDB

по дисциплине:

«Проектирование и реализация баз данных»

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Цель работы: овладеть практическими навыками работы с CRUD-операциями, с вложенными объектами в коллекции базы данных MongoDB, агрегации и изменения данных, со ссылками и индексами в базе данных MongoDB.

Программное обеспечение: среда разработки XAMPP 8 (PHP 8) или аналогичная, СУБД PostgreSQL 1X, pgadmin 4.

Практическое задание:

Задание 8.1.1

Были созданы бд learn и коллекция unicorns добавлены данные в коллекцию unicorns, а также вывел их при помощи find().

```
> use learn
switched to db learn
> db.createCollection("unicorns")
{ "ok" : 1 }
```

```
C:\Program Files\MongoDB\Server\5.0\bin\mongo.exe
> db.unicorns.insert({name: 'Unicrom', loves: ['energon', 'redbull'], weight: 984, gender: 'm', vampires: 182});
WriteResult({ "nInserted" : 1 })
> db.unicorns.insert({name: 'Rooodoooodles', loves: ['apple'], weight: 575, gender: 'm', vampires: 99});
WriteResult({ "nInserted" : 1 })
> db.unicorns.insert({name: 'Solnara', loves: ['apple', 'carrot', 'chocolate'], weight: 550, gender: 'f', vampires: 80});
WriteResult({ "nInserted" : 1 })
> db.unicorns.insert({name: 'Ayna', loves: ['strawberry', 'lemon'], weight: 733, gender: 'f', vampires: 40});
WriteResult({ "nInserted" : 1 })
> db.unicorns.insert({name: 'Kenny', loves: ['grape', 'lemon'], weight: 690, gender: 'm', vampires: 39});
WriteResult({ "nInserted" : 1 })
> db.unicorns.insert({name: 'Raleigh', loves: ['apple', 'sugar'], weight: 421, gender: 'm', vampires: 2});
WriteResult({ "nInserted" : 1 })
> db.unicorns.insert({name: 'Leia', loves: ['apple', 'watermelon'], weight: 601, gender: 'f', vampires: 33});
WriteResult({ "nInserted" : 1 })
> db.unicorns.insert({name: 'Pilot', loves: ['apple', 'watermelon'], weight: 650, gender: 'm', vampires: 54});
WriteResult({ "nInserted" : 1 })
> db.unicorns.insert({name: 'Nimue', loves: ['grape', 'carrot'], weight: 540, gender: 'f'});
WriteResult({ "nInserted" : 1 })
> doc = ({name: 'Dunx', loves: ['grape', 'watermelon'], weight: 704, gender: 'm', vampires: 165})
{
  "name" : "Dunx",
  "loves" : [
    "grape",
    "watermelon"
  ],
  "weight" : 704,
  "gender" : "m",
  "vampires" : 165
}
> db.unicorns.insert(doc)
WriteResult({ "nInserted" : 1 })
> db.unicorns.find()
> db.unicorns.find()
{ "_id" : ObjectId("62862a04088b5516cfc543dc"), "name" : "Horny", "loves" : [ "carrot", "papaya" ], "weight" : 600, "gender" : "m", "vampires" : 63 }
{ "_id" : ObjectId("62862a05088b5516cfc543dd"), "name" : "Aurora", "loves" : [ "carrot", "grape" ], "weight" : 450, "gender" : "f", "vampires" : 43 }
{ "_id" : ObjectId("62862a05088b5516cfc543de"), "name" : "Unicrom", "loves" : [ "energon", "redbull" ], "weight" : 984, "gender" : "m", "vampires" : 182 }
{ "_id" : ObjectId("62862a05088b5516cfc543df"), "name" : "Rooodoooodles", "loves" : [ "apple" ], "weight" : 575, "gender" : "m", "vampires" : 99 }
{ "_id" : ObjectId("62862a05088b5516cfc543e0"), "name" : "Solnara", "loves" : [ "apple", "carrot", "chocolate" ], "weight" : 550, "gender" : "f", "vampires" : 80 }
{ "_id" : ObjectId("62862a05088b5516cfc543e1"), "name" : "Ayna", "loves" : [ "strawberry", "lemon" ], "weight" : 733, "gender" : "f", "vampires" : 40 }
{ "_id" : ObjectId("62862a05088b5516cfc543e2"), "name" : "Kenny", "loves" : [ "grape", "lemon" ], "weight" : 690, "gender" : "m", "vampires" : 39 }
{ "_id" : ObjectId("62862a05088b5516cfc543e3"), "name" : "Raleigh", "loves" : [ "apple", "sugar" ], "weight" : 421, "gender" : "m", "vampires" : 2 }
{ "_id" : ObjectId("62862a05088b5516cfc543e4"), "name" : "Leia", "loves" : [ "apple", "watermelon" ], "weight" : 601, "gender" : "f", "vampires" : 33 }
{ "_id" : ObjectId("62862a05088b5516cfc543e5"), "name" : "Pilot", "loves" : [ "apple", "watermelon" ], "weight" : 650, "gender" : "m", "vampires" : 54 }
{ "_id" : ObjectId("62862a05088b5516cfc543e6"), "name" : "Nimue", "loves" : [ "grape", "carrot" ], "weight" : 540, "gender" : "f" }
{ "_id" : ObjectId("62862b0088b5516cfc543e7"), "name" : "Dunx", "loves" : [ "grape", "watermelon" ], "weight" : 704, "gender" : "m", "vampires" : 165 }
```

Задание 8.1.2

Вывод всех мужских особей

```

> db.unicorns.find({gender: "m"})
{ "_id" : ObjectId("62862a04088b5516cfc543dc"), "name" : "Horny", "loves" : [ "carrot", "papaya" ], "weight" : 600, "gender" : "m", "vampires" : 63 }
{ "_id" : ObjectId("62862a05088b5516cfc543de"), "name" : "Unicrom", "loves" : [ "energon", "redbull" ], "weight" : 984, "gender" : "m", "vampires" : 182 }
{ "_id" : ObjectId("62862a05088b5516cfc543df"), "name" : "Roooooodles", "loves" : [ "apple" ], "weight" : 575, "gender" : "m", "vampires" : 99 }
{ "_id" : ObjectId("62862a05088b5516cfc543e2"), "name" : "Kenny", "loves" : [ "grape", "lemon" ], "weight" : 690, "gender" : "m", "vampires" : 39 }
{ "_id" : ObjectId("62862a05088b5516cfc543e3"), "name" : "Raleigh", "loves" : [ "apple", "sugar" ], "weight" : 421, "gender" : "m", "vampires" : 2 }
{ "_id" : ObjectId("62862a05088b5516cfc543e5"), "name" : "Pilot", "loves" : [ "apple", "watermelon" ], "weight" : 650, "gender" : "m", "vampires" : 54 }
{ "_id" : ObjectId("62862b00088b5516cfc543e7"), "name" : "Dunx", "loves" : [ "grape", "watermelon" ], "weight" : 704, "gender" : "m", "vampires" : 165 }

```

Вывод женских особей, отсортированных по алфавиту и всего первых 3

```

> db.unicorns.find({gender: "f"}).sort({name: 1}).limit(3)
{ "_id" : ObjectId("62862a05088b5516cfc543dd"), "name" : "Aurora", "loves" : [ "carrot", "grape" ], "weight" : 450, "gender" : "f", "vampires" : 43 }
{ "_id" : ObjectId("62862a05088b5516cfc543e1"), "name" : "Ayna", "loves" : [ "strawberry", "lemon" ], "weight" : 733, "gender" : "f", "vampires" : 40 }
{ "_id" : ObjectId("62862a05088b5516cfc543e4"), "name" : "Leia", "loves" : [ "apple", "watermelon" ], "weight" : 601, "gender" : "f", "vampires" : 33 }

```

Вывод первой женской особи, которая любит морковь (2 способами)

```

> db.unicorns.findOne({gender: "f", loves: "carrot"})
{
  "_id" : ObjectId("62862a05088b5516cfc543dd"),
  "name" : "Aurora",
  "loves" : [
    "carrot",
    "grape"
  ],
  "weight" : 450,
  "gender" : "f",
  "vampires" : 43
}
> db.unicorns.find({gender: "f", loves: "carrot"}).limit(1)
{ "_id" : ObjectId("62862a05088b5516cfc543dd"), "name" : "Aurora", "loves" : [ "carrot", "grape" ], "weight" : 450, "gender" : "f", "vampires" : 43 }

```

Задание 8.1.3

Модифицированный запрос для выборки самцов, где отсутствует колонка с полом, а также предпочтения.

```

> db.unicorns.find({gender: "m"}, {"loves": 0, "gender": 0})
{ "_id" : ObjectId("62862a04088b5516cfc543dc"), "name" : "Horny", "weight" : 600, "vampires" : 63 }
{ "_id" : ObjectId("62862a05088b5516cfc543de"), "name" : "Unicrom", "weight" : 984, "vampires" : 182 }
{ "_id" : ObjectId("62862a05088b5516cfc543df"), "name" : "Roooooodles", "weight" : 575, "vampires" : 99 }
{ "_id" : ObjectId("62862a05088b5516cfc543e2"), "name" : "Kenny", "weight" : 690, "vampires" : 39 }
{ "_id" : ObjectId("62862a05088b5516cfc543e3"), "name" : "Raleigh", "weight" : 421, "vampires" : 2 }
{ "_id" : ObjectId("62862a05088b5516cfc543e5"), "name" : "Pilot", "weight" : 650, "vampires" : 54 }
{ "_id" : ObjectId("62862b00088b5516cfc543e7"), "name" : "Dunx", "weight" : 704, "vampires" : 165 }

```

Задание 8.1.4

Выведен список данных по порядку их добавления.

```

> db.unicorns.find().sort({$natural: -1})
{ "_id" : ObjectId("62862b00088b5516cfc543e7"), "name" : "Dunx", "loves" : [ "grape", "watermelon" ], "weight" : 704, "gender" : "m", "vampires" : 165 }
{ "_id" : ObjectId("62862a05088b5516cfc543e5"), "name" : "Nimue", "loves" : [ "grape", "carrot" ], "weight" : 540, "gender" : "f" }
{ "_id" : ObjectId("62862a05088b5516cfc543e6"), "name" : "Pilot", "loves" : [ "apple", "watermelon" ], "weight" : 650, "gender" : "m", "vampires" : 54 }
{ "_id" : ObjectId("62862a05088b5516cfc543e4"), "name" : "Leia", "loves" : [ "apple", "watermelon" ], "weight" : 601, "gender" : "f", "vampires" : 33 }
{ "_id" : ObjectId("62862a05088b5516cfc543e3"), "name" : "Raleigh", "loves" : [ "apple", "sugar" ], "weight" : 421, "gender" : "m", "vampires" : 2 }
{ "_id" : ObjectId("62862a05088b5516cfc543e2"), "name" : "Kenny", "loves" : [ "grape", "lemon" ], "weight" : 690, "gender" : "m", "vampires" : 39 }
{ "_id" : ObjectId("62862a05088b5516cfc543e1"), "name" : "Ayna", "loves" : [ "strawberry", "lemon" ], "weight" : 733, "gender" : "f", "vampires" : 40 }
{ "_id" : ObjectId("62862a05088b5516cfc543e0"), "name" : "Solnara", "loves" : [ "apple", "carrot", "chocolate" ], "weight" : 550, "gender" : "f", "vampires" : 80 }
{ "_id" : ObjectId("62862a05088b5516cfc543df"), "name" : "Roooooodles", "loves" : [ "apple" ], "weight" : 575, "gender" : "m", "vampires" : 99 }
{ "_id" : ObjectId("62862a05088b5516cfc543de"), "name" : "Unicrom", "loves" : [ "energon", "redbull" ], "weight" : 984, "gender" : "m", "vampires" : 182 }
{ "_id" : ObjectId("62862a05088b5516cfc543dd"), "name" : "Aurora", "loves" : [ "carrot", "grape" ], "weight" : 450, "gender" : "f", "vampires" : 43 }
{ "_id" : ObjectId("62862a04088b5516cfc543dc"), "name" : "Horny", "loves" : [ "carrot", "papaya" ], "weight" : 600, "gender" : "m", "vampires" : 63 }

```

Задание 8.1.5

Вывести данные без id, а также вывести только первое предпочтение

```
> db.unicorns.find({}, {_id: 0, loves: {$slice: 1}})
{ "name" : "Horny", "loves" : [ "carrot" ], "weight" : 600, "gender" : "m", "vampires" : 63 }
{ "name" : "Aurora", "loves" : [ "carrot" ], "weight" : 450, "gender" : "f", "vampires" : 43 }
{ "name" : "Unicrom", "loves" : [ "energon" ], "weight" : 984, "gender" : "m", "vampires" : 182 }
{ "name" : "Roooooodles", "loves" : [ "apple" ], "weight" : 575, "gender" : "m", "vampires" : 99 }
{ "name" : "Solnara", "loves" : [ "apple" ], "weight" : 550, "gender" : "f", "vampires" : 80 }
{ "name" : "Ayna", "loves" : [ "strawberry" ], "weight" : 733, "gender" : "f", "vampires" : 40 }
{ "name" : "Kenny", "loves" : [ "grape" ], "weight" : 690, "gender" : "m", "vampires" : 39 }
{ "name" : "Raleigh", "loves" : [ "apple" ], "weight" : 421, "gender" : "m", "vampires" : 2 }
{ "name" : "Leia", "loves" : [ "apple" ], "weight" : 601, "gender" : "f", "vampires" : 33 }
{ "name" : "Pilot", "loves" : [ "apple" ], "weight" : 650, "gender" : "m", "vampires" : 54 }
{ "name" : "Nimue", "loves" : [ "grape" ], "weight" : 540, "gender" : "f" }
{ "name" : "Dunx", "loves" : [ "grape" ], "weight" : 704, "gender" : "m", "vampires" : 165 }
```

Задание 8.1.6

Вывести все значения где вес больше 500 и меньше 700, а также скрыть id.

```
> db.unicorns.find({gender: "f", weight: {$gte: 500, $lte: 700}}, {_id: 0})
{ "name" : "Solnara", "loves" : [ "apple", "carrot", "chocolate" ], "weight" : 550, "gender" : "f", "vampires" : 80 }
{ "name" : "Leia", "loves" : [ "apple", "watermelon" ], "weight" : 601, "gender" : "f", "vampires" : 33 }
{ "name" : "Nimue", "loves" : [ "grape", "carrot" ], "weight" : 540, "gender" : "f" }
```

Задание 8.1.7

Выведен список самцов: которые предпочитают grape, lemon и весом больше 500, а также скрыт id.

```
> db.unicorns.find({gender: "m", weight: {$gte: 500}, loves: {$all: ["grape", "lemon"]}, {_id: 0})
{ "name" : "Kenny", "loves" : [ "grape", "lemon" ], "weight" : 690, "gender" : "m", "vampires" : 39 }
```

Задание 8.1.8

Выбрать все данные, где есть ключ vampires.

```
> db.unicorns.find({vampires: {$exists: true}})
```

В результате запроса было выявлено, что таких данных нет.

Задание 8.1.9

Выведен список самцов по порядку, с информацией о их первом предпочтении.

```
> db.unicorns.find({}, {loves : {$slice : 1}}).sort({name: 1})
{ "_id" : ObjectId("62862a05088b5516cfc543dd"), "name" : "Aurora", "loves" : [ "carrot" ], "weight" : 450, "gender" : "f", "vampires" : 43 }
{ "_id" : ObjectId("62862a05088b5516cfc543e1"), "name" : "Ayna", "loves" : [ "strawberry" ], "weight" : 733, "gender" : "f", "vampires" : 40 }
{ "_id" : ObjectId("62862b00088b5516cfc543e7"), "name" : "Dunx", "loves" : [ "grape" ], "weight" : 704, "gender" : "m", "vampires" : 165 }
{ "_id" : ObjectId("62862a04088b5516cfc543dc"), "name" : "Horny", "loves" : [ "carrot" ], "weight" : 600, "gender" : "m", "vampires" : 63 }
{ "_id" : ObjectId("62862a05088b5516cfc543e2"), "name" : "Kenny", "loves" : [ "grape" ], "weight" : 690, "gender" : "m", "vampires" : 39 }
{ "_id" : ObjectId("62862a05088b5516cfc543e4"), "name" : "Leia", "loves" : [ "apple" ], "weight" : 601, "gender" : "f", "vampires" : 33 }
{ "_id" : ObjectId("62862a05088b5516cfc543e6"), "name" : "Nimue", "loves" : [ "grape" ], "weight" : 540, "gender" : "f" }
{ "_id" : ObjectId("62862a05088b5516cfc543e5"), "name" : "Pilot", "loves" : [ "apple" ], "weight" : 650, "gender" : "m", "vampires" : 54 }
{ "_id" : ObjectId("62862a05088b5516cfc543e3"), "name" : "Raleigh", "loves" : [ "apple" ], "weight" : 421, "gender" : "m", "vampires" : 2 }
{ "_id" : ObjectId("62862a05088b5516cfc543df"), "name" : "Rooooooodles", "loves" : [ "apple" ], "weight" : 575, "gender" : "m", "vampires" : 99 }
{ "_id" : ObjectId("62862a05088b5516cfc543e0"), "name" : "Solnara", "loves" : [ "apple" ], "weight" : 550, "gender" : "f", "vampires" : 80 }
{ "_id" : ObjectId("62862a05088b5516cfc543de"), "name" : "Unicrom", "loves" : [ "energy" ], "weight" : 984, "gender" : "m", "vampires" : 182 }
```

Задание 8.2.1.

Создана коллекция towns и заполнена данными.

Выполнен запрос к мэрам, у которых party = “I”, также выведен в этом запросе только город и данные по мэру.

```
> db.towns.find({"mayor.party" : "I"}, {_id: 0, populatiuon : 0, last_sensus: 0, famous_for : 0})
{ "name" : "New York", "mayor" : { "name" : "Michael Bloomberg", "party" : "I" } }
```

Выполнена запрос для мэра, у которого нет партий, также выведен в этом запросе только город и данные по мэру.

```
> db.towns.find({"mayor.party" : null}, {_id: 0, populatiuon : 0, last_sensus: 0, famous_for : 0})
{ "name" : "Punxsutawney ", "mayor" : { "name" : "Jim Wehrle" } }
```

Задание 8.2.2.

Функция для вывода списка самцов

```

> fn = function() {return this.gender == "m"}
function() {return this.gender == "m"}
> db.unicorns.find(fn)
{ "_id" : ObjectId("62862a04088b5516cfc543dc"), "name" : "Horny", "loves" : [ "carrot",
"papaya" ], "weight" : 600, "gender" : "m", "vampires" : 63 }
{ "_id" : ObjectId("62862a05088b5516cfc543de"), "name" : "Unicrom", "loves" : [ "energo
n", "redbull" ], "weight" : 984, "gender" : "m", "vampires" : 182 }
{ "_id" : ObjectId("62862a05088b5516cfc543df"), "name" : "Rooooooodles", "loves" : [ "ap
ple" ], "weight" : 575, "gender" : "m", "vampires" : 99 }
{ "_id" : ObjectId("62862a05088b5516cfc543e2"), "name" : "Kenny", "loves" : [ "grape",
"lemon" ], "weight" : 690, "gender" : "m", "vampires" : 39 }
{ "_id" : ObjectId("62862a05088b5516cfc543e3"), "name" : "Raleigh", "loves" : [ "apple"
, "sugar" ], "weight" : 421, "gender" : "m", "vampires" : 2 }
{ "_id" : ObjectId("62862a05088b5516cfc543e5"), "name" : "Pilot", "loves" : [ "apple",
"watermelon" ], "weight" : 650, "gender" : "m", "vampires" : 54 }
{ "_id" : ObjectId("62862b00088b5516cfc543e7"), "name" : "Dunx", "loves" : [ "grape", "
watermelon" ], "weight" : 704, "gender" : "m", "vampires" : 165 }

```

Курсор для списка первых двух особей, в алфавитном порядке

```

> var cursor = db.unicorns.find();null;
null
> cursor.limit(2);null
null
> cursor.sort(name: 1);null
uncaught exception: SyntaxError: missing ) after argument list :
@(shell):1:16
> cursor.sort({name: 1});null
null

```

Вывод результата при помощи forEach

```

> cursor.forEach(function(obj) { print(obj.name); })
Aurora
Ayna

```

Задание 8.2.3.

Вывести количество самок весом от 500 до 600.

```

> db.unicorns.find({gender: "f", weight: {$gte: 500, $lte: 600}}).count()
2

```

Задание 8.2.4

Вывести список предпочтений


```
> db.unicorns.distinct("loves")
[
  "apple",
  "carrot",
  "chocolate",
  "energon",
  "grape",
  "lemon",
  "papaya",
  "redbull",
  "strawberry",
  "sugar",
  "watermelon"
]
```

Задание 8.2.5

Посчитать кол-во особей обоих полов.

```
> db.unicorns.aggregate({"$group":{"_id":"$gender", count:{$sum:1}}})
{ "_id" : "m", "count" : 7 }
{ "_id" : "f", "count" : 5 }
```

Задание 8.2.6

Выполнена команда из задания.

```

> db.unicorns.aggregate({"$group":{"_id":"$gender", count:{$sum:1}}})
{ "_id" : "m", "count" : 7 }
{ "_id" : "f", "count" : 5 }
> db.unicorns.save({name: 'Barny', loves: ['grape'],
... weight: 340, gender: 'm'})
WriteResult({ "nInserted" : 1 })
> db.unicorns.find()
{ "_id" : ObjectId("62862a04088b5516cfc543dc"), "name" : "Horny", "loves" : [ "carrot",
"papaya" ], "weight" : 600, "gender" : "m", "vampires" : 63 }
{ "_id" : ObjectId("62862a05088b5516cfc543dd"), "name" : "Aurora", "loves" : [ "carrot"
, "grape" ], "weight" : 450, "gender" : "f", "vampires" : 43 }
{ "_id" : ObjectId("62862a05088b5516cfc543de"), "name" : "Unicrom", "loves" : [ "energo
n", "redbull" ], "weight" : 984, "gender" : "m", "vampires" : 182 }
{ "_id" : ObjectId("62862a05088b5516cfc543df"), "name" : "Roooooodles", "loves" : [ "ap
ple" ], "weight" : 575, "gender" : "m", "vampires" : 99 }
{ "_id" : ObjectId("62862a05088b5516cfc543e0"), "name" : "Solnara", "loves" : [ "apple"
, "carrot", "chocolate" ], "weight" : 550, "gender" : "f", "vampires" : 80 }
{ "_id" : ObjectId("62862a05088b5516cfc543e1"), "name" : "Ayna", "loves" : [ "strawber
ry", "lemon" ], "weight" : 733, "gender" : "f", "vampires" : 40 }
{ "_id" : ObjectId("62862a05088b5516cfc543e2"), "name" : "Kenny", "loves" : [ "grape",
"lemon" ], "weight" : 690, "gender" : "m", "vampires" : 39 }
{ "_id" : ObjectId("62862a05088b5516cfc543e3"), "name" : "Raleigh", "loves" : [ "apple"
, "sugar" ], "weight" : 421, "gender" : "m", "vampires" : 2 }
{ "_id" : ObjectId("62862a05088b5516cfc543e4"), "name" : "Leia", "loves" : [ "apple", "
watermelon" ], "weight" : 601, "gender" : "f", "vampires" : 33 }
{ "_id" : ObjectId("62862a05088b5516cfc543e5"), "name" : "Pilot", "loves" : [ "apple",
"watermelon" ], "weight" : 650, "gender" : "m", "vampires" : 54 }
{ "_id" : ObjectId("62862a05088b5516cfc543e6"), "name" : "Nimue", "loves" : [ "grape",
"carrot" ], "weight" : 540, "gender" : "f" }
{ "_id" : ObjectId("62862b00088b5516cfc543e7"), "name" : "Dunx", "loves" : [ "grape", "
watermelon" ], "weight" : 704, "gender" : "m", "vampires" : 165 }
{ "_id" : ObjectId("6287a9fef7244a88a53d2b99"), "name" : "Barny", "loves" : [ "grape" ]
, "weight" : 340, "gender" : "m" }
>

```

Задание 8.2.7

Для самки единорога Айна внести изменения в БД: теперь ее вес 800, она убила 51 вампира.

```

> db.unicorns.update({name: "Ayna"}, {name: "Ayna", weight: 800, vampires: 51})
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })

```

```

{ "_id" : ObjectId("62862a05088b5516cfc543e1"), "name" : "Ayna", "loves" : [ "strawber
ry", "lemon" ], "weight" : 800, "gender" : "f", "vampires" : 51 }

```

Задание 8.2.8

Для самца единорога Raleigh внести изменения в БД: теперь он любит рэдбул.

```

> db.unicorns.update({name: "Raleigh"}, {$set : {loves: "RedBull"}})
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })

```



```
{ "_id" : ObjectId("62862a05088b5516cfc543e3"), "name" : "Raleigh", "loves" : "RedBull",  
  "weight" : 421, "gender" : "m", "vampires" : 2 }
```

Задание 8.2.9

Всем самцам единорогов увеличить количество убитых вампиров на 5.

```
> db.unicorns.update({gender: "m"}, {$inc: {vampires: 5}})  
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })  
> db.unicorns.find()  
{ "_id" : ObjectId("62862a04088b5516cfc543dc"), "name" : "Horny", "loves" : [ "carrot",  
  "papaya" ], "weight" : 600, "gender" : "m", "vampires" : 68 }  
{ "_id" : ObjectId("62862a05088b5516cfc543dd"), "name" : "Aurora", "loves" : [ "carrot",  
  "grape" ], "weight" : 450, "gender" : "f", "vampires" : 43 }  
{ "_id" : ObjectId("62862a05088b5516cfc543de"), "name" : "Unicrom", "loves" : [ "energo",  
  "redbull" ], "weight" : 984, "gender" : "m", "vampires" : 182 }  
{ "_id" : ObjectId("62862a05088b5516cfc543df"), "name" : "Rooooooodles", "loves" : [ "apple",  
  "watermelon" ], "weight" : 575, "gender" : "m", "vampires" : 99 }  
{ "_id" : ObjectId("62862a05088b5516cfc543e0"), "name" : "Solnara", "loves" : [ "apple",  
  "carrot", "chocolate" ], "weight" : 550, "gender" : "f", "vampires" : 80 }  
{ "_id" : ObjectId("62862a05088b5516cfc543e1"), "name" : "Ayna", "loves" : [ "strawberry",  
  "lemon" ], "weight" : 800, "gender" : "f", "vampires" : 51 }  
{ "_id" : ObjectId("62862a05088b5516cfc543e2"), "name" : "Kenny", "loves" : [ "grape",  
  "lemon" ], "weight" : 690, "gender" : "m", "vampires" : 39 }  
{ "_id" : ObjectId("62862a05088b5516cfc543e3"), "name" : "Raleigh", "loves" : "RedBull",  
  "weight" : 421, "gender" : "m", "vampires" : 2 }  
{ "_id" : ObjectId("62862a05088b5516cfc543e4"), "name" : "Leia", "loves" : [ "apple",  
  "watermelon" ], "weight" : 601, "gender" : "f", "vampires" : 33 }  
{ "_id" : ObjectId("62862a05088b5516cfc543e5"), "name" : "Pilot", "loves" : [ "apple",  
  "watermelon" ], "weight" : 650, "gender" : "m", "vampires" : 54 }  
{ "_id" : ObjectId("62862a05088b5516cfc543e6"), "name" : "Nimue", "loves" : [ "grape",  
  "carrot" ], "weight" : 540, "gender" : "f" }  
{ "_id" : ObjectId("62862b00088b5516cfc543e7"), "name" : "Dunx", "loves" : [ "grape",  
  "watermelon" ], "weight" : 704, "gender" : "m", "vampires" : 165 }  
{ "_id" : ObjectId("6287a9fef7244a88a53d2b99"), "name" : "Barney", "loves" : [ "grape" ],  
  "weight" : 340, "gender" : "m" }  
>
```

Задание 8.2.10

Изменить информацию о городе Портланд: мэр этого города теперь беспартийный.

```
> db.towns.update({name: "Portland"}, {$unset: {mayor: 1}})  
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })  
> db.towns.find()  
{ "_id" : ObjectId("62874dfcf7244a88a53d2b96"), "name" : "Punxsutawney", "populatiuon"  
  : 6200, "last_sensus" : ISODate("2008-01-31T00:00:00Z"), "famous_for" : [ "" ], "mayor"  
  : { "name" : "Jim Wehrle" } }  
{ "_id" : ObjectId("62874e02f7244a88a53d2b97"), "name" : "New York", "populatiuon" : 22  
  200000, "last_sensus" : ISODate("2009-07-31T00:00:00Z"), "famous_for" : [ "status of li  
  berty", "food" ], "mayor" : { "name" : "Michael Bloomberg", "party" : "I" } }  
{ "_id" : ObjectId("62874e08f7244a88a53d2b98"), "name" : "Portland", "populatiuon" : 52  
  8000, "last_sensus" : ISODate("2009-07-20T00:00:00Z"), "famous_for" : [ "beer", "food"  
  ] }
```

Задание 8.2.11

Изменить информацию о самце единорога Pilot: теперь он любит и шоколад.

```
> db.unicorns.update({name : "Pilot"}, {$push: {loves: "chocolate"}})
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
```

```
{ "_id" : ObjectId("62862a05088b5516cfc543e0"), "name" : "Solnara", "loves" : [ "apple", "carrot", "chocolate" ], "weight" : 550, "gender" : "f", "vampires" : 80 }
```

Задание 8.2.12

Изменить информацию о самке единорога Aurora: теперь она любит еще и сахар, и лимоны.

```
> db.unicorns.update({name : "Aurora"}, {$addToSet: {loves: {$each: ["sugar", "lemon"]}}})
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
```

```
{ "_id" : ObjectId("62862a05088b5516cfc543dd"), "name" : "Aurora", "loves" : [ "carrot", "grape", "sugar", "lemon" ], "weight" : 450, "gender" : "f", "vampires" : 43 }
```

Задание 8.2.13

Удалите документы с беспартийными мэрами.

Задание 8.3.1

Создать коллекцию для описания места обитания

Включить ссылку на зону обитания

Вывод таблицы после редактирования

Задание 8.3.2

Проверка создания ключа name с флагом unique.

Задание 8.3.3

Получить информацию о всех индексах

Задание 8.3.4

Создайте объемную коллекцию numbers, задействовав курсор.

Выберите последних четыре документа.

Узнать время запроса

Создать индексы и получить их

Время выполнения после добавления индексов

Вывод:

В данной работе были изучены основные функции MongoDB.

Выводы:

В данной лабораторной работе я овладела практическими навыками создания форм вставки, редактирования и удаления данных.