

## Big Data Lab04

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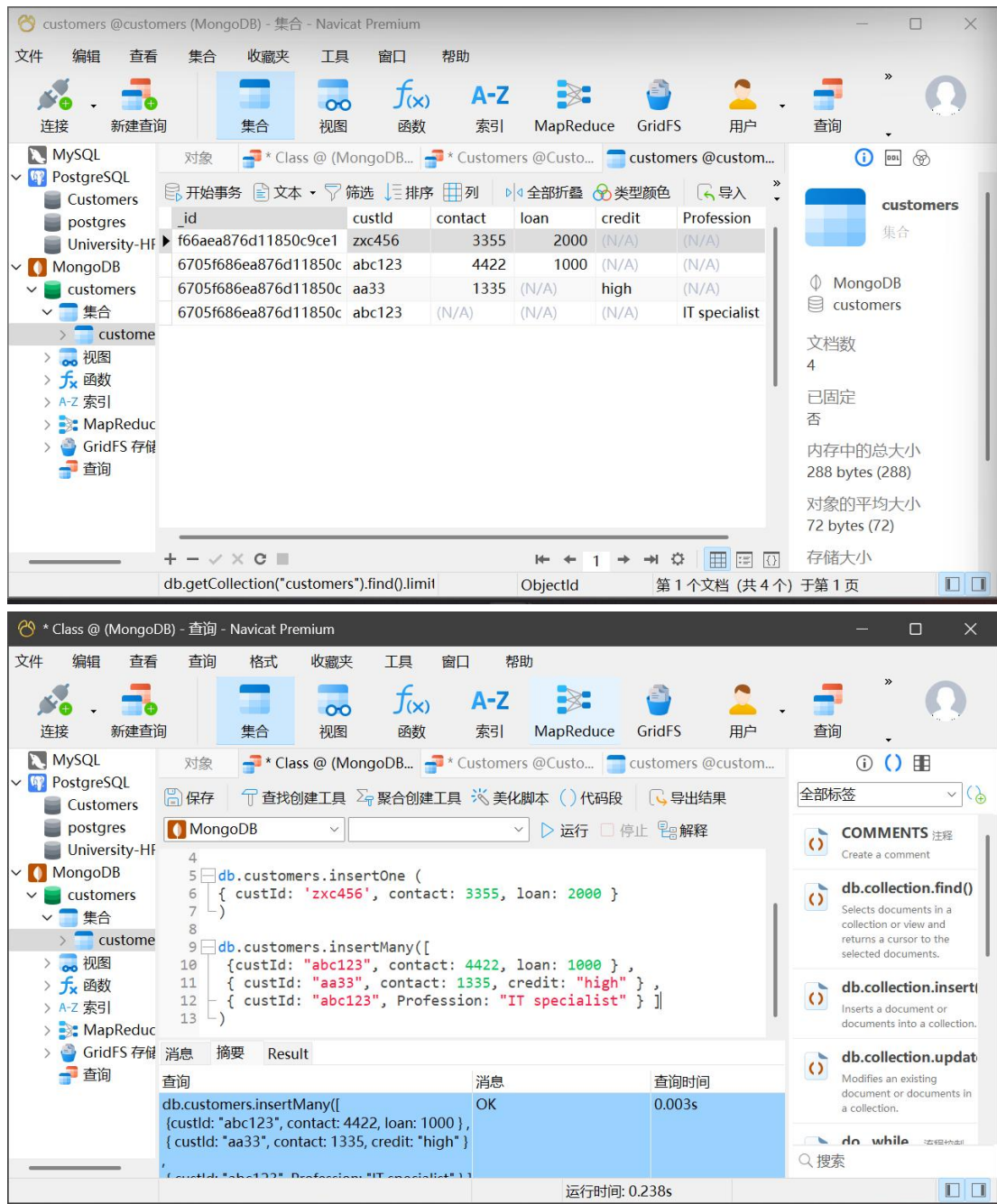
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### Basic Tasks

1/ MongoDB links documents together in a collection relationship, and there some key ways MongoDB handles relationships: **Embedded Documents & References**

2/ In MongoDB, the database is a collection, like a table in Relational Database. And the Data is stored as a json, so it doesn't need to create a excat table before insert the data. In this example, the db.customs. insertOne method is used to insert a document into the customers collection, which contains custId, contact, and loan.

3/ In MongoDB, documents with different fields can be inserted into a collection at any time, making the database design very flexible and able to easily adapt to changes in applications.



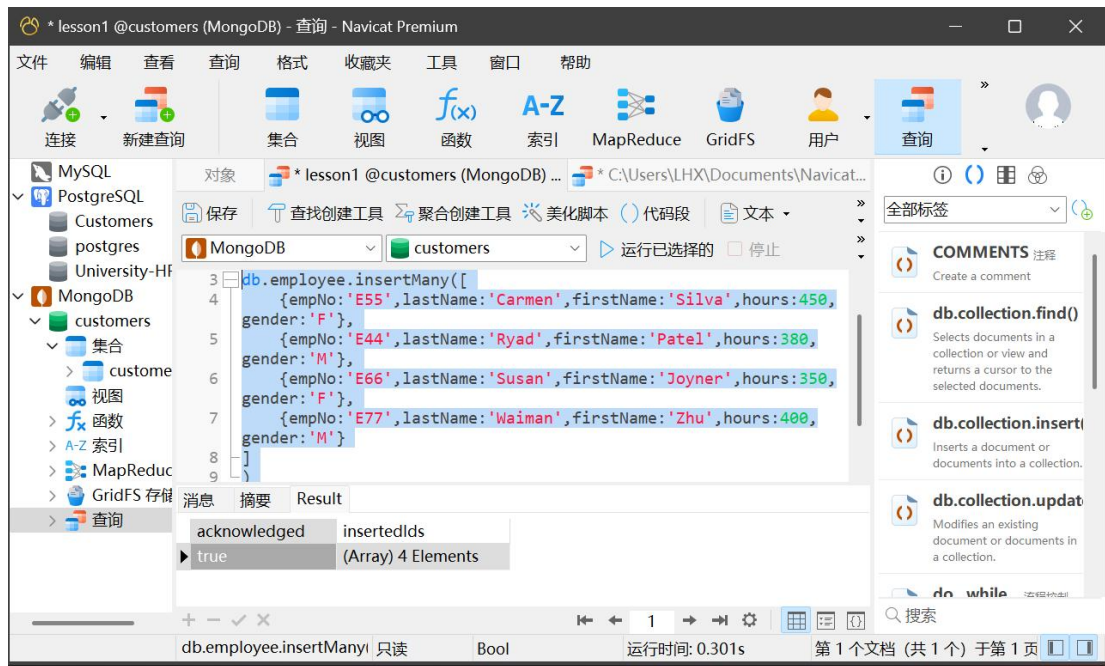
## Medium Tasks

4/ a/

```

db.employee.insertMany([
    {empNo:'E55',lastName:'Carmen',firstName:'Silva',hours:450,gender:'F'},
    {empNo:'E44',lastName:'Ryad',firstName:'Patel',hours:380,gender:'M'},
    {empNo:'E66',lastName:'Susan',firstName:'Joyner',hours:350,gender:'F'},
    {empNo:'E77',lastName:'Waiman',firstName:'Zhu',hours:400,gender:'M'}
])

```



b/

```
db.employee.find({}, {"firstName":1, "lastName":1});
```

```
db.employee.find({"hours": {$gt:400}}, {"empNo":1, "lastName":1, "hours":1});
```

```
db.employee.find({"lastName":/^S/}, {"lastName":1});
```

```
db.employee.find({"gender": {$eq:'F'}}, {"firstName":1, "lastName":1}).sort({"firstName":1});
```

```
db.employee.count({"hours": {$lt:400}});
```

```
db.employee.find( {$or:[ {"gender": {$eq:'F'}}, {"hours": {$gt:350}} ]}, {"firstName":1, "lastName":1}).sort({"lastName":1})
```

消息	摘要	Result															
		<table> <tr> <th>_id</th><th>lastName</th><th>firstName</th></tr> <tr> <td>6705fa16ea876d11850c</td><td>Carmen</td><td>Silva</td></tr> <tr> <td>6705fa16ea876d11850c</td><td>Ryad</td><td>Patel</td></tr> <tr> <td>6705fa16ea876d11850c</td><td>Susan</td><td>Joyner</td></tr> <tr> <td>6705fa16ea876d11850c</td><td>Waiman</td><td>Zhu</td></tr> </table>	_id	lastName	firstName	6705fa16ea876d11850c	Carmen	Silva	6705fa16ea876d11850c	Ryad	Patel	6705fa16ea876d11850c	Susan	Joyner	6705fa16ea876d11850c	Waiman	Zhu
_id	lastName	firstName															
6705fa16ea876d11850c	Carmen	Silva															
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6705fa16ea876d11850c	Waiman	Zhu															

消息	摘要	Result	
_id	empNo	lastName	hours
▶ 6705fa16ea876d11850c	E55	Carmen	450

消息	摘要	Result
	<div><div>_id</div><div>lastName</div></div>	
▶	6705fa16ea876d11850c	Susan

消息	摘要	Result
_id	lastName	firstName
▶ 6705fa16ea876d11850c	Susan	Joyner
6705fa16ea876d11850c	Carmen	Silva

消息	摘要	Result	
	Result		
▶	2		

消息	摘要	Result
_id	lastName	firstName
▶ 6705fa16ea876d11850c	Carmen	Silva
6705fa16ea876d11850c	Ryad	Patel
6705fa16ea876d11850c	Susan	Joyner
6705fa16ea876d11850c	Waiman	Zhu

5/ a/

The nature of big data is defined by volume, velocity, variety, value, and veracity.

b/

Variety refers to the different types and formats of data that are included in big data. Big data can include structured data, unstructured data, and semi-structured data.

c/

MongoDB deals with the variety of data in several ways, making it a highly flexible and versatile database solution for handling diverse datasets. For example, it can deal with structured data, unstructured data, and semi-structured data. And it also has a flexible schema design and can use BSON. In addition, multiple data types are supported in MongoDB.

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#### Advanced Tasks

6/ a/

```
db.books.insertMany([ {
  book_id : 552020,
  author : "D. Sullivan",
  title : "NoSQL for Mere Mortals",
  publisher : "Addison-Wesley",
  year : 2019,
  ISBN : 9080134023212,
  comments:[ {author : "Anonymous", text : "How do I get a copy?" } ]
},
{
  book_id : 3450,
  author : ["P. Saladage", "M. Fowler"],
  title : "NoSQL Distilled",
  publisher : "Addison-Wesley",
  year : 2022,
  ISBN : 9080321826626,
  comments:[ {author : "Matt", text : "Nice overview of SQL"}, {author : "Thomas",
text : "Still relevant"} ]
} ])
```

b/

```
i/db.books.find({$and:[{"year":{"$gte:2019}},{"year":{"$lte:2024"}}]},{})
```

```
ii/db.books.find({"book_id":{"$ne:552020"}},{})
```

```
iii/db.books.find({$or:[{"author":"D.Sullivan"}, {"ISBN":9780134023212}]},  
{})
```

```
iv/db.books.find({$or:[{"ISBN":9876543210}, {"ISBN":0123456789}]},{})
```

```
v/db.books.find({"title":/SQL/},{})
```

```
vi/db.books.find({"publisher":"Addison-Wesley"},{})
```

```
vii/db.books.find({$and:[{"year":2019}, {"title":/Mortals/}]},{}).sort({"title":  
1})
```

```
viii/db.books.update({"year":2019},{$set:{"subject":"computing"}},{multi:tr  
ue})
```