NoSQL

Not Only Relational

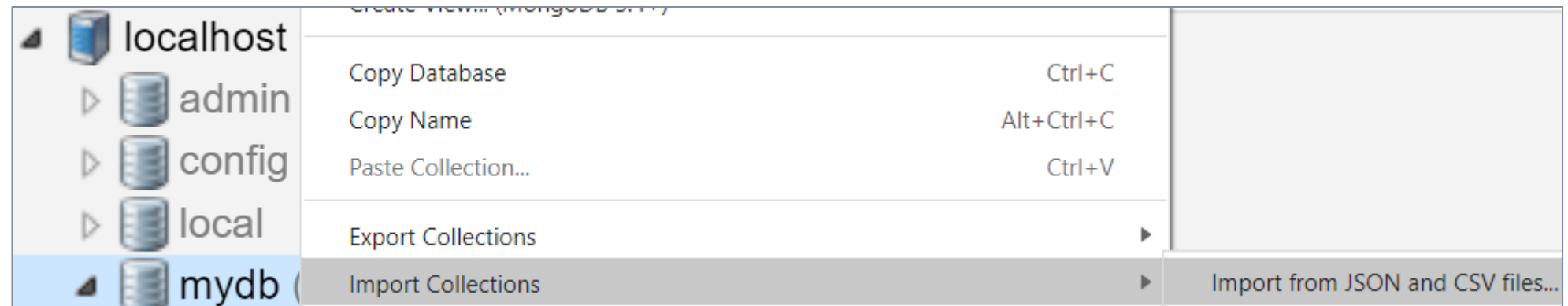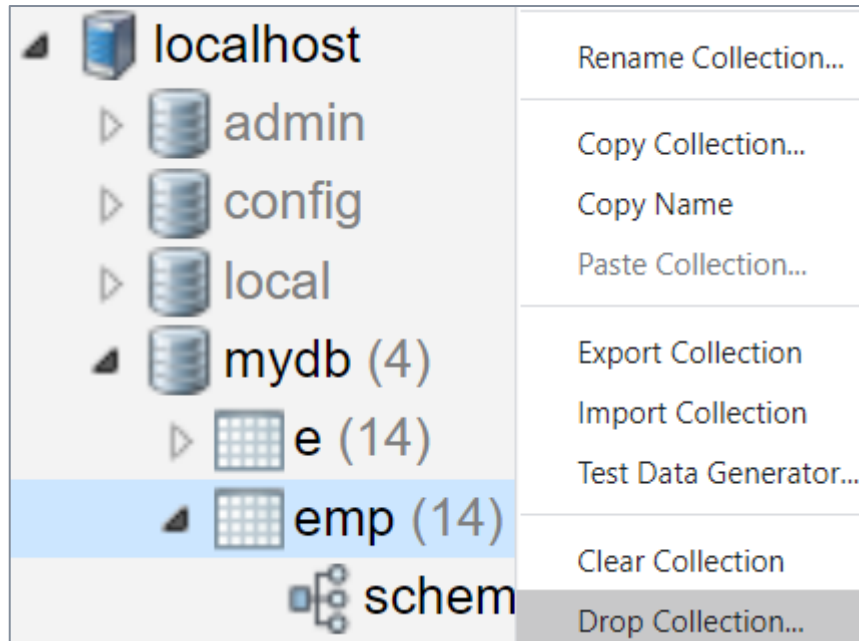Big Data NoSQL Hadoop

Dr. SOHAIL IMRAN

Query

Computer SCIENCE

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Ref: Web

import

localhost
- admin
- config
- local
- mydb (4)
  - e (14)
  - emp (14)
    - schem

Rename Collection...

Copy Collection...
Copy Name
Paste Collection...

Export Collection
Import Collection
Test Data Generator...

Clear Collection
Drop Collection...

Create View... (MongoDB 3.14)

localhost
- admin
- config
- local
- mydb (

Copy Database   Ctrl+C
Copy Name   Alt+Ctrl+C
Paste Collection...   Ctrl+V

Export Collections   ▶
Import Collections   ▶   Import from JSON and CSV files...

mongoDB

datatypes

Import Documents Into the Collection

Target	🗄 localhost ▼	🗄 mydb ▼	🔳 emp ▼

From	JSON or CSV File

File	D:\DataSets\emp.csv

Insertion	Overwrite documents with same _id

✅ Ignore Empty Strings

✅ Stop on conversion error, or leave the value unchanged

✅ Select all   ☐ Unselect all   → Auto size

✅ **ename**	✅ **hiredate**	✅ **job**
String (keep) ▼	String (keep) ▼	String (keep) ▼
ING	11/	PRESIDENT
LAKE	05/	MANAGER
CLARK	06/	MANAGER
ONES	04/	MANAGER

String (keep)
Bool
Int32
Decimal
Double
Int64
Date

NoSQL

projection, _id:0, limit

sort – ascending, descending

```
1  db.emp.find({})
2     .projection({_id:0, empno:1, ename:1, sal:1, deptno:1})
3     .sort({empno:1})  ⇐
```

(property) empno: number

emp   0.034 s   14 Docs   50 ▾   ⏮ ◀ ▶

	empno ▲	ename ⇅	sal ⇅	deptno ⇅
1	7369	SMITH	800	20
2	7499	ALLEN	1,600 (1.6	
3	7521	WARD	1,250 (1.3	
4	7566	JONES	2,975 (3.0	
5	7654	MARTIN	1,250 (1.3	

```
1  db.emp.find({})
2     .projection({_id:0, empno:1, ename:1, sal:1, deptno:1})
3     .sort({empno:-1})  ⇐
```

emp   0.018 s   14 Docs

	empno ⇅	ename ⇅	sal ⇅	deptno ⇅
1	7934	MILLER	1,300 (1.3K)	10
2	7902	FORD	3,000 (3.0K)	20
3	7900	JAMES	950	30
4	7876	ADAMS	1,100 (1.1K)	20
5	7844	TURNER	1,500 (1.5K)	30
6	7839	KING	5,000 (5.0K)	10

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sort - multiple

```
1  db.emp.find({})
2      .projection({_id:0, deptno:1, job:1, empno:1, ename:1, sal:1 })
3      .sort({deptno:1, job:1, empno:1})
```

emp   0.020 s   14 Docs

	empno	ename	job	sal	deptno
1	7934	MILLER	CLERK	1,300 (1.3K)	10
2	7839	KING	PRESIDENT	5,000 (5.0K)	10
3	7782	CLARK	MANAGER	2,450 (2.5K)	10
4	7902	FORD	ANALYST	3,000 (3.0K)	20
5	7876	ADAMS	CLERK	1,100 (1.1K)	20

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NoSQL

find({})

```
1  db.emp.find({deptno:10})
2      .projection({_id:0, empno:1, ename:1, hiredate:1, sal:1, deptno:1})
```

emp		0.035 s	3 Docs		Table ∨

	deptno	empno	ename	hiredate	sal
1	10	7839			
2	10	7782			
3	10	7934			

```
1  db.emp.find({sal:1500})
2      .projection({_id:0, empno:1, ename:1, hiredate:1, sal:1, deptno:1})
```

emp		0.028 s	1 Doc		Table ∨

deptno	empno	ename	hiredate	sal
30	7844	TURNER	9/8/2001, 12:00:00 AM - 24	1,500

```
1  db.emp.find({mgr:null})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
```

emp		0.032 s	1 Doc

deptno	empno	ename	hiredate	job	sal
10	7839	KING	2001-11-16T19:00:00.000+00:00 - 23 years ago	PRESIDENT	5,000 (5.0K)

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mongoDB

$comparisonOperator, $not


```
1  db.emp.find({sal:{$lte:1500}})
2    .projection({_id:0, empno:1, ename:1, hiredate:1, sal:1, deptno:1}
```

emp | 0.030 s | 7 Docs

deptno	empno	ename	hiredate	sal
30	7654	MARTIN	9/28/2001, 12:00:00 AM - 2	1,250
30	7844	TURNER	9/8/2001, 12:00:00 AM - 24	1,500
30	7900	JAMES	12/3/2001, 12:00:00 AM - 2	950
			2/22/2001, 12:00:00 AM - 2	1,250
			12/17/2000, 12:00:00 AM -	800
			5/23/2007, 12:00:00 AM - 1	1,100
			1/23/2002, 12:00:00 AM - 2	1,300

```
1  db.emp.find({sal:{$not:{$lte:1500}}})
2    .projection({_id:0, empno:1, ename:1, hiredate:1, sal:1, deptno:1})
```

emp | 0.031 s | 7 Docs

deptno	empno	ename	hiredate	sal
10	7839	KING	11/17/2001, 12:00:00 AM - :	5,000
30	7698	BLAKE	5/1/2001, 12:00:00 AM - 24	2,850
10	7782	CLARK	6/9/2001, 12:00:00 AM - 24	2,450
20	7566	JONES	4/2/2001, 12:00:00 AM - 24	2,975
30	7499	ALLEN	2/20/2001, 12:00:00 AM - 2	1,600
20	7902	FORD	2/3/2001, 12:00:00 AM - 24	3,000
20	7788	SCOTT	4/19/2007, 12:00:00 AM - 1	3,000

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NoSQL

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$in, $mod

```
1  db.emp.find({empno:{$in:[7788,7900]}})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
```

emp   0.052 s   2 Docs

deptno	empno	ename	hiredate	job	sal
30	7900	JAMES	2001-12-02T19:00:00.000+00:00 - 23 years ago	CLERK	950
20	7788	SCOTT	2007-04-18T19:00:00.000+00:00 - 18 years ago	ANALYST	3,000 (3.0K)

```
1  db.emp.find({empno:{$mod:[2,1]}})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
```

emp   0.031 s   4 Docs

deptno	empno	ename	hiredate	job	sal
10	7839	KING	2001-11-16T19:00:00.000+00:00 - 23 years ago	PRESIDENT	5,000 (5.0K)
30	7499	ALLEN	2001-02-19T19:00:00.000+00:00 - 24 years ago	SALESMAN	1,600 (1.6K)
30	7521	WARD	2001-02-21T19:00:00.000+00:00 - 24 years ago	SALESMAN	1,250 (1.3K)
20	7369	SMITH	2000-12-16T19:00:00.000+00:00 - 24 years ago	CLERK	800

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NoSQL

$and


```
1  db.emp.find({job:"CLERK", deptno:20})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
3      .sort({})
4      .limit(0)
```

emp		0.037 s	2 Docs			
deptno	empno	ename	hiredate	job	sal
20	7369	SMITH	2000-12-16T19:00:00.000+00:00 - 24 years ago	CLERK	800
20	7876	ADAMS	2007-05-22T19:00:00.000+00:00 - 18 years ago	CLERK	1,100 (1.1K)

Alternative
$and
is the
default

```
1  db.emp.find({$and:[{job:"CLERK"}, {deptno:20}]})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
3      .sort({})
4      .limit(0)
```

emp		0.029 s	2 Docs			
deptno	empno	ename	hiredate	job	sal
20	7369	SMITH	2000-12-16T19:00:00.000+00:00 - 24 years ago	CLERK	800
20	7876	ADAMS	2007-05-22T19:00:00.000+00:00 - 18 years ago	CLERK	1,100 (1.1K)

$and
Logical
Operator

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NoSQL

$or

```
1  db.emp.find({$or:[{job:"CLERK"}, {deptno:20}]})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
3      .sort({})
4      .limit(0)
```

emp | 0.041 s | 7 Docs

deptno	empno	ename	hiredate	job	sal
20	7566	JONES	2001-04-01T19:00:00.000+00:00 - 24 years ago	MANAGER	2,975 (3.0K)
30	7900	JAMES	2001-12-02T19:00:00.000+00:00 - 23 years ago	CLERK	950
20	7902	FORD	2001-02-02T19:00:00.000+00:00 - 24 years ago	ANALYST	3,000 (3.0K)
20	7369	SMITH	2000-12-16T19:00:00.000+00:00 - 24 years ago	CLERK	800
20	7788	SCOTT	2007-04-18T19:00:00.000+00:00 - 18 years ago	ANALYST	3,000 (3.0K)
20	7876	ADAMS	2007-05-22T19:00:00.000+00:00 - 18 years ago	CLERK	1,100 (1.1K)
10	7934	MILLER	2002-01-22T19:00:00.000+00:00 - 23 years ago	CLERK	1,300 (1.3K)

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NoSQL

mongoDB

date datatype

deptno	empno	ename	hiredate	job	sal
30	7499	ALLEN	2/20/2001, 12:00:00 AM - 24 years ago	SALESMAN	1,600 (1.6K)
30	7521	WARD	2/2...	SALESMAN	...
30	7654	MARTIN	9/28...		
30	7844	TURNER	9/8/...		

Display DateTime in ▶

- Filter by "hiredate" ▶
- Project by "hiredate" ▶
- Order by "hiredate" ▶
- Group by "hiredate" ▶

- Field ▶

- Document ▶

- Show/hide Filter Row...

- Copy ▶

- Create Index by Query Criteria... ▶

- Save This Query as a new MongoDB Collection

○ UTC -> "2001-02-21T19:00:00.000Z"
○ System -> "Thu Feb 22 2001 00:00:00 GMT+0500 (Pakistan Standard Time)"
◉ Locale -> "2/22/2001, 12:00:00 AM"
○ LocaleDate -> "2/22/2001"
○ LocaleTime -> "12:00:00 AM"
○ ISO8601 -> "2001-02-22T00:00:00.000+05:00"
○ YMD_Hms -> "2001-02-22T00:00:00+05:00"
○ DMY_Hms -> "22/02/2001T00:00:00+05:00"
○ MDY_Hms -> "02/22/2001T00:00:00+05:00"
○ YMD -> "2001-02-22"
○ DMY -> "22/02/2001"
○ MDY -> "02/22/2001"

Timezone to Display in (local) ▶

✓ Show Relative Time Part (e.g. 24 years ago)

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NoSQL

date values

```
1  db.emp.find({})
2      .projection({_id:0, empno:1, ename:1, hiredate:1})
3      .sort({hiredate:-1})
```

	emp	0.022 s	14 Docs

	empno	ename	hiredate
1	7876	ADAMS	5/23/2007, 12:00:00 AM - 17 years ago
2	7788	SCOTT	4/19/2007, 12:00:00 AM - 17 years ago
3	7934	MILLER	1/23/2002, 12:00:00 AM - 23 years ago
4	7900	JAMES	12/3/2001, 12:00:00 AM - 23 y

```
1  db.emp.find({ hiredate:{
2                          $gt: ISODate("2001-05-31"),
3                          $lt: ISODate("2001-11-01")
4                          }
5                  })
```

emp	0.041 s	3 Docs	50 ∨

comm	deptno	empno	ename	hiredate
null	10	7782	CLARK	2001-06-08T
1,400 (1.4K)	30	7654	MARTIN	2001-09-27T
0	30	7844	TURNER	2001-09-07T

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NoSQL

date values: functions

```
8   db.emp.find({})
9       .projection({_id: 0, empno:1, ename:1, hiredate: 1, Year: {$year: "$hiredate"}
10      })     |
```

Find ✖				
emp	0.022 s	14 Docs		

	empno ⇕	ename ⇕	hiredate ⇕	Year ⇕
1	7839	KING	2001-11-17	2001
2	7698	BLAKE	2001-05-01	2001
3	7782	CLARK	2001-06-09	2001
4	7566	JONES	2001-04-02	2001
5	7654	MARTIN	2001-09-28	2001

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NoSQL

Pattern Matching

```
1  db.emp.find({ename: /^A/})
2    .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
3    .sort({})
4    .limit(0)
```

deptno	empno	ename	hiredate	job	sal
30	7499	ALLEN	2001-02-19T19:00:00.000+00:00 - 24 years ago	SALESMAN	1,600 (1.6K)
20	7876	ADAMS	2007-05-22T19:00:00.000+00:00 - 18 years ago	CLERK	1,100 (1.1K)

```
1  db.emp.find({ename: /N$/})
2    .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
3    .sort({})
4    .limit(0)
```

deptno	empno	ename	hiredate	job	sal
30	7654	MARTIN	2001-09-27T19:00:00.000+00:00 - 24 years ago	SALESMAN	1,250 (1.3K)
30	7499	ALLEN	2001-02-19T19:00:00.000+00:00 - 24 years ago	SALESMAN	1,600 (1.6K)

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NoSQL

mongoDB

$regex

```
1  db.emp.find({ename: /AM/})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
3      .sort({})
4      .limit(0)
```

| emp | 0.017 s | 2 Docs | | | | 50 | |
deptno ⇕	empno ⇕	ename ⇕	hiredate ⇕		job ⇕	sal ⇕
30	7900	JAMES	2001-12-02T19:00:00.000+00:00 - 23 years ago		CLERK	950
20	7876	ADAMS	2007-05-22T19:00:00.000+00:00 - 18 years ago		CLERK	1,100 (1.1K)

```
1  db.emp.find({ename: {$regex:"AM"}})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
3      .sort({})
4      .limit(0)
```

| emp | 0.033 s | 2 Docs | | | | 50 | |
deptno ⇕	empno ⇕	ename ⇕	hiredate ⇕		job ⇕	sal ⇕
30	7900	JAMES	2001-12-02T19:00:00.000+00:00 - 23 years ago		CLERK	950
20	7876	ADAMS	2007-05-22T19:00:00.000+00:00 - 18 years ago		CLERK	1,100 (1.1K)

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mongoDB

NoSQL

CaSe InSeNsiTiVe

```
1  db.emp.find({ename: {$regex:"am"}})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
3      .sort({})
4      .limit(0)
```

| emp | 🗄 0.034 s | 0 Doc | 📥 ▾ 🔀 | 📝 🔍 | 50 ⌄ | ◄ ◄ ► ►| ↻ | p. 0 | 0 - 0 |

No records found

```
1  db.emp.find({ename: {$regex:"am", $options:"i"}})
2      .projection({_id:0, empno:1, ename:1, job:1, hiredate:1, sal:1, deptno:1})
3      .sort({})
4      .limit(0)
```

| emp | 🗄 0.032 s | 2 Docs | 📥 ▾ 🔀 | 📝 🔍 | 50 ⌄ | ◄ ◄ ► ►| ↻ | p. 1 | 1 - 2 |

deptno ⇕	empno ⇕	ename ⇕	hiredate ⇕	job ⇕	sal ⇕
30	7900	JAMES	2001-12-02T19:00:00.000+00:00 - 23 years ago	CLERK	950
20	7876	ADAMS	2007-05-22T19:00:00.000+00:00 - 18 years ago	CLERK	1,100 (1.1K)

NoSQL

concat, expression

```
1  db.emp.find({})
2 ▾    .projection({
3        _id:0, empno:1, ename:1, job:1, "Name-Job":{$concat: ["$ename", "-", "$job" ]}
4    })
```

	empno	ename	job	Name-Job
1	7839	KING	PRESIDENT	KING-PRESIDENT
2	7698	BLAKE	MANAGER	BLAKE-MANAGER
3	7782	CLARK	MANAGER	CLARK-MANAGER

emp | 0.019 s | 14 Docs | 20 ⌄

```
1  db.emp.find({})
2 ▾    .projection({
3        _id:0, empno:1, ename:1, sal:1, "AnnualSal": {$multiply: ["$sal",12]}
4    })
```

emp | 0.019 s | 14 Docs

	empno	ename	sal	AnnualSal
1	7876	ADAMS	1,100	13,200
2	7499	ALLEN	1,600	19,200
3	7698	BLAKE	2,850	34,200
4	7782	CLARK	2,450	29,400

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NoSQL

mongoDB

aggregate

```
8 ▾  db.emp.aggregate([
9         { $group: { _id: "Average Sal", "AvgSal": {"$avg":"$sal"} } }
10        ])
```

Aggregate (1) ✖

	emp	0.018 s	1 Doc

	_id	AvgSal
1	Average Sal	2,073.2143

```
1  db.emp.aggregate({})
2      .project({_id:0, empno:1, ename:1, hiredate:1, Year: {$year: "$hiredate"}})
3      .match({Year:2001})
```

emp 0.022 s 10 Docs

	empno	ename	hiredate	Year
1	7839	KING	11/17/2001, 12:00:00 AM - 23 years ago	2001
2	7698	BLAKE	5/1/2001, 12:00:00 AM - 23 years ago	2001
3	7782	CLARK	6/9/2001, 12:00:00 AM - 23 years ago	2001
4	7566	JONES	4/2/2001, 12:00:00 AM - 23 years ago	2001
5	7654	MARTIN	9/28/2001, 12:00:00 AM - 23 years ago	2001

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condition

```
8   db.emp.find({})
9 -      .projection({_id: 0, empno:1, ename:1, sal: 1,
10 -         SalAvg: {$cond: {
11              if: { $gte: ["$sal", 2000] }, then: "AboveAvg", else: "BelowAvg"
12          }}
13      })
```

Find (1) ✖

emp   0.018 s   14 Docs   20 ▾   ⏮

	empno	ename	sal	SalAvg
1	7839	KING	5,000	AboveAvg
2	7698	BLAKE	2,850	AboveAvg
3	7782	CLARK	2,450	AboveAvg
4	7566	JONES	2,975	AboveAvg
5	7654	MARTIN	1,250	BelowAvg
6	7499	ALLEN	1,600	BelowAvg

```
8 -  db.emp.aggregate([
9 -      {$project: {_id: 0, sal:1, empno:1, ename:1,
10 -          SalAvg: {$cond: {
11              if: { $gte: ["$sal", 2000] }, then: "AboveAvg", else: "BelowAvg"}
12          }
13      }}
14  ])
```

NoSQL

expr – find, match

```
1  db.emp.find({$expr:{$gt:[{$multiply: ["$sal",12]}, 20000]}
2      })
3      .projection({_id:0, empno:1, ename:1, sal:1, "AnnualSal": {$multiply: ["$sal",12]}
4      })
```

```
7   db.emp.aggregate({})
8       .project({
9       _id:0, empno:1, ename:1, hiredate:1, sal:1, "AnnualSal": {$multiply: ["$sal",12]}
10      })
11      .match({
12          'AnnualSal': {'$gt': 20000}
13      })
```

Error ×	Error (1) ×	Aggregate ×	Aggregate (1) ×	**Aggregate (2) ×**

emp   0.027 s   6 Docs   20

	empno	ename	hiredate	sal	AnnualSal
1	7839	KING	2001-11-17	5,000	60,000
2	7698	BLAKE	2001-05-01	2,850	34,200
3	7782	CLARK	2001-06-09	2,450	29,400
4	7566	JONES	2001-04-02	2,975	35,700
5	7902	FORD	2001-02-03	3,000	36,000
6	7788	SCOTT	2007-04-19	3,000	36,000

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NoSQL