

CS 457 - Homework Assignment 6: NoSQL

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Database = “ds”

Collection = “hw6”

1. **db.hw6.find()**

- **between 1901 to 2016 there are 955 Nobel awards**

hw6 > id							
_id	id	firstname	surname	born	died	bornCountry	bornCountry
622646637eb559...	1	Wilhelm Conrad	Röntgen	1845-03-27	1923-02-10	Prussia (now G...	DE
622646637eb559...	2	Hendrik A.	Lorentz	1853-07-18	1928-02-04	the Netherlands	NL
622646637eb559...	3	Pieter	Zeeman	1865-05-25	1943-10-09	the Netherlands	NL
622646637eb559...	4	Henri	Becquerel	1852-12-15	1908-08-25	France	FR
622646637eb559...	5	Pierre	Curie	1859-05-15	1906-04-19	France	FR
622646637eb559...	6	Marie	Curie	1867-11-07	1934-07-04	Russian Empire...	PL
622646637eb559...	8	Lord	Rayleigh	1842-11-12	1919-06-30	United Kingdom	GB
622646637eb559...	9	Philipp	Lenard	1862-06-07	1947-05-20	Hungary (now ...	SK
622646637eb559...	10	JJ.	Thomson	1856-12-18	1940-08-30	United Kingdom	GB
622646637eb559...	11	Albert A.	Michelson	1852-12-19	1931-05-09	Prussia (now P...	PL
622646637eb559...	12	Gabriel	Lippmann	1845-08-16	1921-07-13	Luxembourg	LU

```
1 {
2   "_id" : ObjectId("622646637eb5596294befaa3"),
3   "id" : "1",
4   "firstname" : "Wilhelm Conrad",
5   "surname" : "Röntgen",
6   "born" : "1845-03-27",
7   "died" : "1923-02-10",
8   "bornCountry" : "Prussia (now Germany)",
9   "bornCountryCode" : "DE",
10  "bornCity" : "Lennep (now Remscheid)",
11  "diedCountry" : "Germany",
12  "diedCountryCode" : "DE",
13  "diedCity" : "Munich",
14  "gender" : "male",
15  "prizes" : [
16    {
17      "year" : "1901",
18      "category" : "physics",
```

2. **db.hw6.aggregate([{\$group: { _id: "\$diedCountryCode", count: { \$sum: 1 } }},{ \$sort: { count: -1 } }])**

- the record of death of Nobel prize winners is mostly missing

```
100 Documents 1 to 47
1 {
2   "_id" : null,
3   "count" : 335.0
4 }
5 {
6   "_id" : "US",
7   "count" : 223.0
8 }
9 {
10  "_id" : "GB",
11  "count" : 83.0
12 }
13 {
14  "_id" : "DE",
15  "count" : 59.0
16 }
17 {
18  "_id" : "FR",
19  "count" : 51.0
20 }
21 {
22  "_id" : "SE",
23  "count" : 29.0
24 }
```

hw6 > count		
_id	count	
■ null	123 335.0	
□ " " US	123 223.0	
□ " " GB	123 83.0	
□ " " DE	123 59.0	
□ " " FR	123 51.0	
□ " " SE	123 29.0	
□ " " CH	123 27.0	
□ " " RU	123 15.0	
□ " " IT	123 14.0	
□ " " NL	123 10.0	

3. `db.hw6.aggregate([{$group: { _id: "$prizes.category", count: { $sum: 1 } } },{ $sort: { count: -1 } }])`
 - there are 222 people who won the prize in the field of medicine

hw6 > count

_id	count
[1 elements]	222.0
[1 elements]	213.0
[1 elements]	182.0
[1 elements]	129.0
[1 elements]	117.0
[1 elements]	86.0
[2 elements]	1.0
[2 elements]	1.0
[3 elements]	1.0
[2 elements]	1.0

4. **db.hw6.aggregate(**

```
[
  { $match : { "prizes": { $elemMatch: { category : "physics" } } } }
], {
  $group : { _id: [ "$gender", "$diedCountryCode", "$prizes" ]
    , count: { $sum: 1 } } }
,
{ $sort: { diedCountryCode : 1, _id : 1 } }
]
)
```

- **There are only 2 females who won the prize in physics**

hw6 > count

_id	count
[3 elements]	123 1.0
[3 elements]	123 1.0
[3 elements]	123 1.0
[3 elements]	123 1.0
[3 elements]	123 1.0
[3 elements]	123 1.0
[3 elements]	123 2.0
[3 elements]	123 1.0
[3 elements]	123 1.0
[3 elements]	123 1.0

1 document selected

← → | 50 | Documents 1 to 50 | [Pin Result](#) [Query Code](#) [Explain Query](#) [JSON View](#)

```

1 {
2   "_id" : [
3     "male",
4     null,
5     [
6       {
7         "year" : "2003",
8         "category" : "physics",
9         "share" : "3",
10        "motivation" : "\"for pioneering contributions to the theory of superconductors and superfluids\"",
11        "affiliations" : [
12          {
13            "name" : "University of Illinois",
14            "city" : "Urbana, IL",
15            "country" : "USA"
16          }
17        ]
18      }
19    ]
20   ]
21 }

```

5. db.hw6.aggregate(

```

[
  { $match : { "prizes": { $elemMatch: { category : "physics" } } } },
  {
    $group : { _id: [ "$gender", "$prize.category", "$prizes" ]
    , count: { $sum: 1 } } }
  ,
  { $sort: { diedCountryCode : 1, _id : 1 } }
]
)

```

- There above query tells the male and female prize winners in the field of physics. With count related to their country

```
1 {
2   "_id" : [
3     "male",
4     null,
5     [
6       {
7         "year" : "1966",
8         "category" : "physics",
9         "share" : "1",
10        "motivation" : "\"for the discovery and development of optical methods for studying Hertzian resonances in atoms\"",
11        "affiliations" : [
12          {
13            "name" : "École Normale Supérieure",
14            "city" : "Paris",
15            "country" : "France"
16          }
17        ]
18      }
19    ]
20  ],
21  "count" : 1.0
22 }
23 {
24   "_id" : [
25     "male",
```

hw6 > count		
_id	count	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	2.0	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	1.0	
[3 elements]	1.0	
1 document selected		