

# The distinct() method

INTRODUCTION TO MONGODB IN PYTHON



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# An exceptional laureate

```
db.laureates.find_one({"prizes.2": {"$exists": True}})
```

```
{'_id': ObjectId('5baacf97f35b632bbe12c1ad'),  
  'born': '0000-00-00',  
  'died': '0000-00-00',  
  'firstname': ('Comité international de la Croix Rouge'  
               '(International Committee of the Red Cross)'),  
  'gender': 'org',  
  'id': '482',  
  'prizes': [{ 'affiliations': [],  
                'category': 'peace',  
                'share': '1',  
                'year': '1917'},  
             { 'affiliations': [], 'category': 'peace',  
               'share': '1', 'year': '1944'},  
             { 'affiliations': [], 'category': 'peace',  
               'share': '2', 'year': '1963'}]}
```

# Using `.distinct()`

```
db.laureates.distinct("gender")
```

```
['male', 'female', 'org']
```

- A convenience method for a common aggregation (like `count_documents` )
- We will learn how to create custom aggregations in Chapter 4
- `distinct` aggregation is efficient if there is a collection *index* on the field
- We will learn how to create an index in Chapter 3
- No index needed here: collection fits in memory, has ~1,000 documents

# .distinct() with dot notation

```
db.laureates.find_one({"prizes.2": {"$exists": True}})
```

```
{'_id': ObjectId('5baacf97f35b632bbe12c1ad'),  
  'born': '0000-00-00',  
  'died': '0000-00-00',  
  'firstname': ('Comité international de la Croix Rouge'  
               '(International Committee of the Red Cross)'),  
  'gender': 'org',  
  'id': '482',  
  'prizes': [{ 'affiliations': [],  
                'category': 'peace',  
                'share': '1',  
                'year': '1917'},  
              { 'affiliations': [], 'category': 'peace',  
                'share': '1', 'year': '1944'},  
              { 'affiliations': [], 'category': 'peace',  
                'share': '2', 'year': '1963'}}]
```

```
db.laureates.distinct("prizes.category")
```

```
['physics', 'chemistry', 'peace',  
 'medicine', 'literature', 'economics']
```

```
['physics', 'chemistry', 'peace', 'medicine', 'literature', 'economy']
```

# Let's practice!

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# Pre-filtering distinct values

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# Awards into prize shares

```
db.laureates.find_one({"prizes.share": "4"})
```

```
{'bornCountry': 'France',  
  'died': '1906-04-19',  
  'diedCountry': 'France',,  
  'firstname': 'Pierre',  
  'prizes': [{'affiliations': [{'city': 'Paris',  
    'country': 'France',  
    'name': ('École municipale de physique et de chimie'  
      'industrielles (Municipal School of Industrial'  
      'Physics and Chemistry)')}]},  
  'motivation': ('"in recognition of the extraordinary'  
    'services they have rendered by their'  
    'joint researches on the radiation'  
    'phenomena discovered by Professor'  
    'Henri Becquerel"''),  
  'category': 'physics', 'share': '4', 'year': '1903'}],  
  'surname': 'Curie',  
  ...  
}
```

# High-share prize categories

```
db.laureates.distinct("prizes.category")
```

```
['physics', 'chemistry', 'peace',  
 'medicine', 'literature', 'economics']
```

```
list(db.laureates.find({"prizes.share": "4"}))
```

```
[...]
```

```
db.laureates.distinct(  
    "prizes.category", {"prizes.share": '4'})
```

```
['physics', 'chemistry', 'medicine']
```

```
db.prizes.distinct("category", {"laureates.share": "4"})
```

```
['physics', 'medicine', 'chemistry']
```



# Prize categories with multi-winners

```
db.laureates.count_documents({"prizes.1": {"$exists": True}})
```

```
6
```

```
db.laureates.distinct(  
    "prizes.category", {"prizes.1": {"$exists": True}})
```

```
['chemistry', 'physics', 'peace']
```

```
# We'll learn how to do this in the next chapter:  
[[{'category': 'physics'}, {'category': 'chemistry'}],  
 [{'category': 'physics'}, {'category': 'physics'}],  
 [{'category': 'chemistry'}, {'category': 'peace'}],  
 [{'category': 'chemistry'}, {'category': 'chemistry'}],  
 [{'category': 'peace'}, {'category': 'peace'},  
  {'category': 'peace'}],  
 [{'category': 'peace'}, {'category': 'peace'}]]
```

# Practice time!

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# Matching array fields

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# Array fields and equality

```
{'firstname': 'John',  
  'surname': 'Bardeen',  
  'prizes': [{  
    'category': 'physics', 'year': '1956', 'share': '3',  
    'motivation': ('"for their researches on semiconductors and their'  
                  'discovery of the transistor effect"'),  
    ...  
  }, {  
    'category': 'physics', 'year': '1972', 'share': '3',  
    'motivation': ('"for their jointly developed theory of'  
                  'superconductivity, usually called the BCS-theory"'),  
    ...  
  }],  
  ...  
}
```

```
db.laureates.count_documents({"prizes.category": "physics"})
```

# Array fields and equality, simplified

```
# Imaginary extra field in John Bardeen's document:  
{"nicknames": ["Johnny", "JSwitch", "JB", "Tc Johnny", "Bardy"]}
```

```
db.laureates.find({"nicknames": "JB"})  
# different than {"nicknames": ["JB"]}
```



# Array fields and operators

```
db.laureates.count_documents(  
    {"prizes.category": "physics"})
```

206

```
db.laureates.count_documents(  
    {"prizes.category": {"$ne": "physics"}})
```

716

```
db.laureates.count_documents({  
    "prizes.category": {  
        "$in": ["physics", "chemistry", "medicine"]}})
```

596

```
db.laureates.count_documents({  
    "prizes.category": {  
        "$nin": ["physics", "chemistry", "medicine"]}})
```

326

326

# Enter \$elemMatch

```
db.laureates.count_documents({  
    "prizes": {  
        "category": "physics", "share": "1"}}})
```

0

```
db.laureates.count_documents({  
    "prizes.category": "physics", "prizes.share": "1"})
```

48

```
db.laureates.count_documents({  
    "prizes": {"$elemMatch": {  
        "category": "physics", "share": "1"}}})
```

47

```
db.laureates.count_documents({  
    "prizes": {"$elemMatch": {  
        "category": "physics",  
        "share": "1",  
        "year": {"$lt": "1945"}, }}}})
```

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# Onward and array-ward!

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# Distinct As You Like It: Filtering with Regular Expressions

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# Finding a substring with \$regex

```
db.laureates.find_one({"firstname": "Marie"})
```

```
{'born': '1867-11-07',  
  'bornCity': 'Warsaw',  
  'bornCountry': 'Russian Empire (now Poland)',  
  'firstname': 'Marie',  
  'surname': 'Curie, née Skłodowska',  
  ...}
```

```
db.laureates.distinct("bornCountry",  
                      {"bornCountry": {"$regex": "Poland"}})
```

```
['Russian Empire (now Poland)',  
 'Prussia (now Poland)',  
 'Germany (now Poland)',  
 'Austria-Hungary (now Poland)',  
 'German-occupied Poland (now Poland)',  
 'Poland',  
 'Poland (now Ukraine)',  
 'Poland (now Lithuania)',  
 'Poland (now Belarus)',  
 'Free City of Danzig (now Poland)']
```

# Flag options for regular expressions

```
case_sensitive = db.laureates.distinct(
    "bornCountry",
    {"bornCountry": {"$regex": "Poland"}})
```

```
case_insensitive = db.laureates.distinct(
    "bornCountry",
    {"bornCountry": {"$regex": "poland", "$options": "i"}})
```

```
assert set(case_sensitive) == set(case_insensitive)
```

```
from bson.regex import Regex
```

```
db.laureates.distinct("bornCountry",
    {"bornCountry": Regex("poland", "i")})
```

```
['Russian Empire (now Poland)', ...]
```

```
import re

db.laureates.distinct("bornCountry",
    {"bornCountry": re.compile("poland", re.I)})
```

```
['Russian Empire (now Poland)', ...]
```

# Beginning and ending (and escaping)

```
from bson.regex import Regex
```

```
db.laureates.distinct("bornCountry",  
                      {"bornCountry": Regex("^Poland")})
```

```
['Poland',  
 'Poland (now Ukraine)',  
 'Poland (now Lithuania)',  
 'Poland (now Belarus)']
```

```
db.laureates.distinct(  
    "bornCountry",  
    {"bornCountry": Regex("^Poland \ (now")})
```

```
['Poland (now Ukraine)',  
 'Poland (now Lithuania)',  
 'Poland (now Belarus)']
```

```
db.laureates.distinct(  
    "bornCountry",  
    {"bornCountry": Regex("now Poland\)$")})
```

```
['Russian Empire (now Poland)',  
 'Prussia (now Poland)',  
 'Germany (now Poland)',  
 'Austria-Hungary (now Poland)',  
 'German-occupied Poland (now Poland)',  
 'Free City of Danzig (now Poland)']
```

# Let's practice!

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