

Shengtao Tony Hou
USC ID: 9712707229
DSCI551
11/06/2022

Q1 Script: db.country.find({GNP:{\$gte:10000,\$lte:15000}},{"Name":1,"_id":0})

Output:

```
[
  { Name: 'Bulgaria' },
  { Name: 'Belarus' },
  { Name: 'Brunei' },
  { Name: 'Côte d'Ivoire' },
  { Name: 'Costa Rica' },
  { Name: 'Iraq' },
  { Name: 'Lithuania' },
  { Name: 'Sudan' },
  { Name: 'El Salvador' },
  { Name: 'Uzbekistan' }
]
```

Q2 Script: db.country.aggregate({\$set:{Capital:{\$toString: '\$Capital'}}},{ \$match: {"Capital":/0/}},{\$group: {_id:null, Count:{\$sum:1}}})

Output: 63

Q3 Script: db.country.distinct("Continent")

Output:

```
[
  'Africa',
  'Antarctica',
  'Asia',
  'Europe',
  'North America',
  'Oceania',
  'South America'
]
```

Q4 Script: db.country.find({}, {Name:1,GNP:1,"_id":0}).sort({GNP:-1}).limit(5)

Output:

```
[
  { Name: 'United States', GNP: 8510700 },
  { Name: 'Japan', GNP: 3787042 },
  { Name: 'Germany', GNP: 2133367 },
  { Name: 'France', GNP: 1424285 },
  { Name: 'United Kingdom', GNP: 1378330 }
]
```

]

Q5 Script:

```
db.countrylanguage.distinct("Language",{ $and:[{"IsOfficial":"T"}, {"Percentage":{$gte:95}}])
```

Output:

```
[
  'Albaniana',  'Arabic',
  'Bengali',    'Dhivehi',
  'Dutch',      'English',
  'Faroese',    'Greek',
  'Hungarian',  'Icelandic',
  'Italian',    'Japanese',
  'Kiribati',   'Kirundi',
  'Korean',     'Malagasy',
  'Maltese',    'Marshallese',
  'Norwegian',  'Polish',
  'Portuguese', 'Rwanda',
  'Serbo-Croatian', 'Somali',
  'Spanish',    'Tongan'
]
```

Q6 Script:

```
db.city.find({ $and:[{"Name":/Los/i}, {"Population":{$gte:200000}}]}, {"Name":1, "_id":0})
```

Output:

```
[
  { Name: 'Santiago de los Caballeros' },
  { Name: 'Santo Domingo de los Colorados' },
  { Name: 'Ecatepec de Morelos' },
  { Name: 'San Nicolás de los Garza' },
  { Name: 'Los Angeles' }
]
```

Q7 Script: db.country.aggregate({\$group: {_id: "\$Continent", avg_gnp: {\$avg: "\$GNP"}}})

Output:

```
[
  { _id: 'Asia', avg_gnp: 150105.72549019608 },
  { _id: 'North America', avg_gnp: 261854.78918918918 },
  { _id: 'Europe', avg_gnp: 206497.0652173913 },
  { _id: 'Oceania', avg_gnp: 14991.953571428572 },
  { _id: 'Antarctica', avg_gnp: 0 },
  { _id: 'Africa', avg_gnp: 10006.465517241379 },
  { _id: 'South America', avg_gnp: 107991 }
]
```

Q8 Script: db.countrylanguage.aggregate({\$match: {"IsOfficial": "T"}}, {\$group: {_id: "\$Language", cnt: {\$sum: 1}}}, {\$sort: {cnt: -1}}, {\$limit: 10})

Output:

```
[
  { _id: 'English', cnt: 44 },
  { _id: 'Arabic', cnt: 22 },
  { _id: 'Spanish', cnt: 20 },
  { _id: 'French', cnt: 18 },
  { _id: 'German', cnt: 6 },
  { _id: 'Portuguese', cnt: 6 },
  { _id: 'Malay', cnt: 4 },
  { _id: 'Italian', cnt: 4 },
  { _id: 'Dutch', cnt: 4 },
  { _id: 'Danish', cnt: 3 }
]
```

Q9 Script: db.country.aggregate({\$match: {"Continent": 'North America'}}, {\$lookup: {from: 'city', localField: 'Capital', foreignField: 'ID', as: 'res'}}, {\$match: {GNP: {\$gte: 100000}}}, {\$project: {Name: 1, "res.Name": 1, _id: 0}})

Output:

```
[
  { Name: 'Canada', res: [ { Name: 'Ottawa' } ] },
  { Name: 'Mexico', res: [ { Name: 'Ciudad de MÃ©xico' } ] },
  { Name: 'United States', res: [ { Name: 'Washington' } ] }
]
```

Q10 Script: db.country.aggregate({\$match: {"Continent": 'North America'}}, {\$lookup: {from: 'countrylanguage', localField: 'Code', foreignField: 'CountryCode', as: 'res'}}, {\$match: {\$and: [{"res.Language": "English"}, {"res.IsOfficial": "T"}]}}, {\$project: {Name: 1, _id: 0}})

Output:

```
[
  { Name: 'Aruba' },
  { Name: 'Anguilla' },
  { Name: 'Netherlands Antilles' },
  { Name: 'Antigua and Barbuda' },
  { Name: 'Belize' },
  { Name: 'Bermuda' },
  { Name: 'Barbados' },
  { Name: 'Canada' },
  { Name: 'Cayman Islands' },
]
```

```
{ Name: 'Saint Kitts and Nevis' },  
{ Name: 'Saint Lucia' },  
{ Name: 'Montserrat' },  
{ Name: 'Puerto Rico' },  
{ Name: 'Turks and Caicos Islands' },  
{ Name: 'United States' },  
{ Name: 'Saint Vincent and the Grenadines' },  
{ Name: 'Virgin Islands, British' },  
{ Name: 'Virgin Islands, U.S.' }  
]
```