

MongoDB -Aggregation Exercises

Import the zips.json file into your MongoDB. Database name is "population" and collection name is "zipcodes".

`mongoimport --db population --collection zipcodes --file zips.json`

```
C:\Windows\System32\cmd.exe
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C:\Users\LENOVO\Downloads\mongosh-1.1.9-win32-x64\mongosh-1.1.9-win32-x64\bin>mongoimport --db population --collection zipcodes --file D:\zip.json
2022-02-10T11:24:12.367+0530   connected to: mongod://localhost/
2022-02-10T11:24:12.370+0530   dropping: population.zipcodes
2022-02-10T11:24:13.530+0530   29353 document(s) imported successfully. 0 document(s) failed to import.

C:\Users\LENOVO\Downloads\mongosh-1.1.9-win32-x64\mongosh-1.1.9-win32-x64\bin>
```

Atlanta Population

1. use `db.zipcodes.find()` to filter results to only the results where city is ATLANTA and state is GA.

```
Command Prompt - mongo
> db.zipcodes.find({city:"ATLANTA",state:"GA"})
{"_id":"30303","city":"ATLANTA","loc":[-84.388846,33.752504],"pop":1845,"state":"GA"}
{"_id":"30305","city":"ATLANTA","loc":[-84.385145,33.831963],"pop":19122,"state":"GA"}
{"_id":"30306","city":"ATLANTA","loc":[-84.351418,33.786027],"pop":20081,"state":"GA"}
{"_id":"30307","city":"ATLANTA","loc":[-84.335957,33.769138],"pop":16330,"state":"GA"}
{"_id":"30308","city":"ATLANTA","loc":[-84.375744,33.771839],"pop":8549,"state":"GA"}
{"_id":"30309","city":"ATLANTA","loc":[-84.388338,33.798407],"pop":14766,"state":"GA"}
{"_id":"30310","city":"ATLANTA","loc":[-84.423173,33.727849],"pop":34017,"state":"GA"}
{"_id":"30311","city":"ATLANTA","loc":[-84.470219,33.722957],"pop":34880,"state":"GA"}
{"_id":"30312","city":"ATLANTA","loc":[-84.378125,33.746749],"pop":17683,"state":"GA"}
{"_id":"30313","city":"ATLANTA","loc":[-84.39352,33.76825],"pop":8038,"state":"GA"}
{"_id":"30314","city":"ATLANTA","loc":[-84.425546,33.756103],"pop":26649,"state":"GA"}
{"_id":"30315","city":"ATLANTA","loc":[-84.380771,33.705062],"pop":41061,"state":"GA"}
{"_id":"30316","city":"ATLANTA","loc":[-84.333913,33.721686],"pop":34668,"state":"GA"}
{"_id":"30317","city":"ATLANTA","loc":[-84.31685,33.749788],"pop":16395,"state":"GA"}
{"_id":"30318","city":"ATLANTA","loc":[-84.445432,33.786454],"pop":53894,"state":"GA"}
{"_id":"30319","city":"ATLANTA","loc":[-84.335091,33.868728],"pop":32138,"state":"GA"}
{"_id":"30324","city":"ATLANTA","loc":[-84.354867,33.820609],"pop":15044,"state":"GA"}
{"_id":"30326","city":"ATLANTA","loc":[-84.358232,33.848168],"pop":125,"state":"GA"}
{"_id":"30327","city":"ATLANTA","loc":[-84.419966,33.862723],"pop":18467,"state":"GA"}
{"_id":"30329","city":"ATLANTA","loc":[-84.321402,33.823555],"pop":17013,"state":"GA"}
Type "it" for more
> it
{"_id":"30330","city":"ATLANTA","loc":[-84.434735,33.70645],"pop":643,"state":"GA"}
{"_id":"30331","city":"ATLANTA","loc":[-84.520468,33.72241],"pop":38185,"state":"GA"}
{"_id":"30334","city":"ATLANTA","loc":[-84.388188,33.74715],"pop":0,"state":"GA"}
{"_id":"30336","city":"ATLANTA","loc":[-84.510028,33.78534],"pop":1228,"state":"GA"}
{"_id":"30339","city":"ATLANTA","loc":[-84.462879,33.87125],"pop":11158,"state":"GA"}
{"_id":"30342","city":"ATLANTA","loc":[-84.376091,33.884245],"pop":19057,"state":"GA"}
```

2. use `db.zipcodes.aggregate` with `$match` to do the same as above.

3. use `$group` to count the number of zip codes in Atlanta.

4. use `$group` to find the total population in Atlanta.

```
Command Prompt - mongo
> db.zipcodes.aggregate([
...  {$match:{city:"ATLANTA"}},
...  {$group:{_id:"$id"}},
...  {$count:"totalzips"}}])
{"_id":"ATLANTA","totalzips":41}
> db.zipcodes.aggregate([
...  {$group:{_id:"city",totalpop:{sum:"$pop"}}},
...  {$match:{_id:"ATLANTA"}}])
{"_id":"ATLANTA","totalpop":630046}
```

Populations By State

1. use aggregate to calculate the total population for each state

```
Command Prompt - mongo
> db.zipcodes.aggregate([{$group: {_id: {city: "$city", state: "$state"}, totalpop: {$sum: "$pop"} }}, {$sort:
: {_id: 1}}])
{"_id": {"city": "AARON", "state": "KY"}, "totalpop": 270 }
{"_id": {"city": "AARONSBURG", "state": "PA"}, "totalpop": 100 }
{"_id": {"city": "ADAC", "state": "GA"}, "totalpop": 27986 }
{"_id": {"city": "ABBEVILLE", "state": "AL"}, "totalpop": 5416 }
{"_id": {"city": "ABBEVILLE", "state": "GA"}, "totalpop": 1991 }
{"_id": {"city": "ABBEVILLE", "state": "MS"}, "totalpop": 4649 }
{"_id": {"city": "ABBEVILLE", "state": "SC"}, "totalpop": 11344 }
{"_id": {"city": "ABBOT VILLAGE", "state": "NE"}, "totalpop": 1193 }
{"_id": {"city": "ABBOTSFORD", "state": "WI"}, "totalpop": 2480 }
{"_id": {"city": "ABBOTT", "state": "TX"}, "totalpop": 577 }
{"_id": {"city": "ABBOTT PARK", "state": "IL"}, "totalpop": 26542 }
{"_id": {"city": "ABBOTTSTOWN", "state": "PA"}, "totalpop": 1777 }
{"_id": {"city": "ABBYVILLE", "state": "KS"}, "totalpop": 267 }
{"_id": {"city": "ABELL", "state": "MD"}, "totalpop": 601 }
{"_id": {"city": "ABERDEEN", "state": "MD"}, "totalpop": 19229 }
{"_id": {"city": "ABERDEEN", "state": "MS"}, "totalpop": 15769 }
{"_id": {"city": "ABERDEEN", "state": "NC"}, "totalpop": 7767 }
{"_id": {"city": "ABERDEEN", "state": "OH"}, "totalpop": 2176 }
{"_id": {"city": "ABERDEEN", "state": "SD"}, "totalpop": 28786 }
{"_id": {"city": "ABERDEEN", "state": "WA"}, "totalpop": 22340 }
type "it" for more
> it
{"_id": {"city": "ABERDEEN PROVING", "state": "MD"}, "totalpop": 5294 }
{"_id": {"city": "ABERNATHY", "state": "TX"}, "totalpop": 3482 }
{"_id": {"city": "ABIE", "state": "NE"}, "totalpop": 282 }
{"_id": {"city": "ABILENE", "state": "KS"}, "totalpop": 8249 }
{"_id": {"city": "ABILENE", "state": "TX"}, "totalpop": 104462 }
{"_id": {"city": "ABINGDON", "state": "IL"}, "totalpop": 4241 }
{"_id": {"city": "ABINGDON", "state": "MD"}, "totalpop": 12664 }
{"_id": {"city": "ABINGDON", "state": "VA"}, "totalpop": 25429 }
{"_id": {"city": "ABINGTON", "state": "MA"}, "totalpop": 13849 }
{"_id": {"city": "ABITQUI", "state": "NM"}, "totalpop": 1538 }
{"_id": {"city": "ABITA SPRINGS", "state": "LA"}, "totalpop": 2659 }
{"_id": {"city": "ABRAMHAM", "state": "WV"}, "totalpop": 2348 }
{"_id": {"city": "ABRAMS", "state": "MI"}, "totalpop": 1212 }
{"_id": {"city": "ABSARAKA", "state": "ND"}, "totalpop": 124 }
{"_id": {"city": "ABSAROKEE", "state": "MT"}, "totalpop": 1330 }
{"_id": {"city": "ACADEMY", "state": "SD"}, "totalpop": 2425 }
{"_id": {"city": "ACAMPO", "state": "CA"}, "totalpop": 7734 }
{"_id": {"city": "ACCIDENT", "state": "MD"}, "totalpop": 1968 }
{"_id": {"city": "ACCOKEEK", "state": "MD"}, "totalpop": 4843 }
{"_id": {"city": "ACCOMAC", "state": "VA"}, "totalpop": 2562 }
type "it" for more
> it
{"_id": {"city": "ACCORD", "state": "NY"}, "totalpop": 2695 }
{"_id": {"city": "ACEQUIA", "state": "ID"}, "totalpop": 9761 }
{"_id": {"city": "ACKERLY", "state": "TX"}, "totalpop": 793 }
```

```
Command Prompt - mongo
{"_id": {"city": "ACCIDENT", "state": "MD"}, "totalpop": 1968 }
{"_id": {"city": "ACCOKEEK", "state": "MD"}, "totalpop": 4843 }
{"_id": {"city": "ACCOMAC", "state": "VA"}, "totalpop": 2562 }
type "it" for more
> it
{"_id": {"city": "ACCORD", "state": "NY"}, "totalpop": 2695 }
{"_id": {"city": "ACEQUIA", "state": "ID"}, "totalpop": 9761 }
{"_id": {"city": "ACKERLY", "state": "TX"}, "totalpop": 793 }
{"_id": {"city": "ACKERMAN", "state": "MS"}, "totalpop": 5827 }
{"_id": {"city": "ACKERLEY", "state": "IA"}, "totalpop": 2316 }
{"_id": {"city": "ACKMORTH", "state": "IA"}, "totalpop": 491 }
{"_id": {"city": "ACMAR", "state": "AL"}, "totalpop": 6055 }
{"_id": {"city": "ACME", "state": "LA"}, "totalpop": 173 }
{"_id": {"city": "ACME", "state": "PA"}, "totalpop": 3862 }
{"_id": {"city": "ACME", "state": "WA"}, "totalpop": 471 }
{"_id": {"city": "ACME", "state": "WY"}, "totalpop": 868 }
{"_id": {"city": "ACRA", "state": "NY"}, "totalpop": 525 }
{"_id": {"city": "ACTION", "state": "CA"}, "totalpop": 6139 }
{"_id": {"city": "ACTION", "state": "IN"}, "totalpop": 3642 }
{"_id": {"city": "ACTION", "state": "MA"}, "totalpop": 15514 }
{"_id": {"city": "ACTION", "state": "ME"}, "totalpop": 767 }
{"_id": {"city": "ACTION", "state": "MI"}, "totalpop": 55 }
{"_id": {"city": "ACUSHNET", "state": "MA"}, "totalpop": 9601 }
{"_id": {"city": "ACMORTH", "state": "GA"}, "totalpop": 37976 }
{"_id": {"city": "ADA", "state": "KS"}, "totalpop": 179 }
type "it" for more
> it
{"_id": {"city": "ADA", "state": "MI"}, "totalpop": 9568 }
{"_id": {"city": "ADA", "state": "OH"}, "totalpop": 7299 }
{"_id": {"city": "ADA", "state": "OK"}, "totalpop": 24967 }
{"_id": {"city": "ADAH", "state": "PA"}, "totalpop": 596 }
{"_id": {"city": "ADAIR", "state": "IA"}, "totalpop": 1748 }
{"_id": {"city": "ADAIR", "state": "IL"}, "totalpop": 731 }
{"_id": {"city": "ADAIR", "state": "OK"}, "totalpop": 4938 }
{"_id": {"city": "ADAIRSVILLE", "state": "GA"}, "totalpop": 7273 }
{"_id": {"city": "ADAIRVILLE", "state": "KY"}, "totalpop": 2481 }
{"_id": {"city": "ADAMANT", "state": "VT"}, "totalpop": 456 }
{"_id": {"city": "ADAMS", "state": "IN"}, "totalpop": 19250 }
{"_id": {"city": "ADAMS", "state": "KY"}, "totalpop": 2540 }
{"_id": {"city": "ADAMS", "state": "MA"}, "totalpop": 9901 }
{"_id": {"city": "ADAMS", "state": "MN"}, "totalpop": 1214 }
{"_id": {"city": "ADAMS", "state": "ND"}, "totalpop": 312 }
{"_id": {"city": "ADAMS", "state": "NE"}, "totalpop": 1127 }
{"_id": {"city": "ADAMS", "state": "OR"}, "totalpop": 609 }
{"_id": {"city": "ADAMS", "state": "TN"}, "totalpop": 2660 }
{"_id": {"city": "ADAMS", "state": "WI"}, "totalpop": 2342 }
{"_id": {"city": "ADAMS BASIN", "state": "NV"}, "totalpop": 989 }
type "it" for more
```

2. sort the results by population, highest first

```
Command Prompt - mongo
> db.zipcodes.aggregate({ $group: { _id: {city: '$city', state: '$state'}, totalpop: { $sum: '$pop' } } }, { $sort:
{ _id: 1 } })
{ "_id": { "city": "ZWOLLE", "state": "LA", "totalpop": 5325 }
{ "_id": { "city": "ZWINGLE", "state": "IA", "totalpop": 1320 }
{ "_id": { "city": "ZURICH", "state": "KS", "totalpop": 318 }
{ "_id": { "city": "ZUMI", "state": "VA", "totalpop": 2162 }
{ "_id": { "city": "ZUMI", "state": "NM", "totalpop": 7382 }
{ "_id": { "city": "ZUMBOTA", "state": "MN", "totalpop": 3535 }
{ "_id": { "city": "ZORTMAN", "state": "MT", "totalpop": 394 }
{ "_id": { "city": "ZOLFO SPRINGS", "state": "FL", "totalpop": 3515 }
{ "_id": { "city": "ZOE", "state": "KY", "totalpop": 190 }
{ "_id": { "city": "ZOARVILLE", "state": "OH", "totalpop": 2969 }
{ "_id": { "city": "ZIRCONIA", "state": "NC", "totalpop": 2350 }
{ "_id": { "city": "ZIONVILLE", "state": "NC", "totalpop": 1633 }
{ "_id": { "city": "ZIONSVILLE", "state": "PA", "totalpop": 2312 }
{ "_id": { "city": "ZIONSVILLE", "state": "IN", "totalpop": 9299 }
{ "_id": { "city": "ZION GROVE", "state": "PA", "totalpop": 2070 }
{ "_id": { "city": "ZION", "state": "IL", "totalpop": 24944 }
{ "_id": { "city": "ZION", "state": "AR", "totalpop": 1880 }
{ "_id": { "city": "ZIMMERMAN", "state": "MN", "totalpop": 5786 }
{ "_id": { "city": "ZIN", "state": "MN", "totalpop": 507 }
{ "_id": { "city": "ZILLAH", "state": "WA", "totalpop": 5266 }
Type "it" for more
> it
{ "_id": { "city": "ZIGZAG", "state": "OR", "totalpop": 1325 }
{ "_id": { "city": "ZIEGLERSVILLE", "state": "PA", "totalpop": 290 }
{ "_id": { "city": "ZIA PUEBLO", "state": "NM", "totalpop": 877 }
{ "_id": { "city": "ZEPHYRHILLS", "state": "FL", "totalpop": 39172 }
{ "_id": { "city": "ZEPHYR", "state": "TX", "totalpop": 433 }
{ "_id": { "city": "ZEOMA", "state": "SD", "totalpop": 8 }
{ "_id": { "city": "ZEONDA", "state": "KS", "totalpop": 200 }
{ "_id": { "city": "ZEILWOOD", "state": "FL", "totalpop": 1930 }
{ "_id": { "city": "ZELL", "state": "SD", "totalpop": 131 }
{ "_id": { "city": "ZELLENOPLE", "state": "PA", "totalpop": 18300 }
{ "_id": { "city": "ZEIGLER", "state": "IL", "totalpop": 2502 }
{ "_id": { "city": "ZEELAND", "state": "MD", "totalpop": 497 }
{ "_id": { "city": "ZEELAND", "state": "MI", "totalpop": 15649 }
{ "_id": { "city": "ZEBULON", "state": "NC", "totalpop": 10153 }
{ "_id": { "city": "ZEBULON", "state": "GA", "totalpop": 2470 }
{ "_id": { "city": "ZEARING", "state": "IA", "totalpop": 1032 }
{ "_id": { "city": "ZAVALLA", "state": "TX", "totalpop": 2295 }
{ "_id": { "city": "ZAPATA", "state": "TX", "totalpop": 8408 }
{ "_id": { "city": "ZAP", "state": "MD", "totalpop": 338 }
{ "_id": { "city": "ZANONI", "state": "MO", "totalpop": 274 }
Type "it" for more
> it
{ "_id": { "city": "ZANESFIELD", "state": "OH", "totalpop": 1171 }
{ "_id": { "city": "ZANORA", "state": "CA", "totalpop": 317 }
{ "_id": { "city": "ZALMA", "state": "MO", "totalpop": 858 }
```

3. limit the results to just the first 3 results. What are the top 3 states in population?

```
Command Prompt - mongo
> db.zipcodes.aggregate({ $group: { _id: {city: '$city', state: '$state'}, totalpop: { $sum: '$pop' } } }, { $sort:
{ totalpop: -1 } }, { $limit: 3 })
{ "_id": { "city": "CHICAGO", "state": "IL", "totalpop": 2452177 }
{ "_id": { "city": "BROOKLYN", "state": "NY", "totalpop": 2300504 }
{ "_id": { "city": "LOS ANGELES", "state": "CA", "totalpop": 2102295 }
```

Populations by City

1. use aggregate to calculate the total population for each city (you have to use city/state combination). You can use a combination for the _id of the \$group: { city: '\$city', state: '\$state' }

```
Command Prompt - mongo
> db.zipcodes.aggregate({ $group: { _id: {city: '$city', state: '$state'}, totalpop: { $sum: '$pop' } } }, { $sort:
{ _id: 1 } })
{ "_id": { "city": "AARON", "state": "KY", "totalpop": 270 }
{ "_id": { "city": "AARONSBURG", "state": "PA", "totalpop": 100 }
{ "_id": { "city": "ABAC", "state": "GA", "totalpop": 27906 }
{ "_id": { "city": "ABBEVILLE", "state": "AL", "totalpop": 5416 }
{ "_id": { "city": "ABBEVILLE", "state": "GA", "totalpop": 1991 }
{ "_id": { "city": "ABBEVILLE", "state": "MS", "totalpop": 4649 }
{ "_id": { "city": "ABBEVILLE", "state": "SC", "totalpop": 11344 }
{ "_id": { "city": "ABBOT VILLAGE", "state": "ME", "totalpop": 1193 }
{ "_id": { "city": "ABBOTSFORD", "state": "MT", "totalpop": 2480 }
{ "_id": { "city": "ABBOTT", "state": "TX", "totalpop": 577 }
{ "_id": { "city": "ABBOTT PARK", "state": "IL", "totalpop": 26542 }
{ "_id": { "city": "ABBOTTSTOWN", "state": "PA", "totalpop": 1777 }
{ "_id": { "city": "ABBYVILLE", "state": "KS", "totalpop": 267 }
{ "_id": { "city": "ABELL", "state": "MD", "totalpop": 601 }
{ "_id": { "city": "ABERDEEN", "state": "MD", "totalpop": 19229 }
{ "_id": { "city": "ABERDEEN", "state": "MS", "totalpop": 15769 }
{ "_id": { "city": "ABERDEEN", "state": "NC", "totalpop": 7767 }
{ "_id": { "city": "ABERDEEN", "state": "OH", "totalpop": 2176 }
{ "_id": { "city": "ABERDEEN", "state": "SD", "totalpop": 28786 }
{ "_id": { "city": "ABERDEEN", "state": "WA", "totalpop": 22346 }
Type "it" for more
> it
{ "_id": { "city": "ABERDEEN PROVING", "state": "MD", "totalpop": 5294 }
{ "_id": { "city": "ABERNATH", "state": "TX", "totalpop": 3482 }
{ "_id": { "city": "ABIE", "state": "NE", "totalpop": 282 }
{ "_id": { "city": "ABILENE", "state": "KS", "totalpop": 8249 }
{ "_id": { "city": "ABILENE", "state": "TX", "totalpop": 104462 }
{ "_id": { "city": "ABINGDON", "state": "IL", "totalpop": 4241 }
{ "_id": { "city": "ABINGDON", "state": "MD", "totalpop": 12664 }
{ "_id": { "city": "ABINGDON", "state": "VA", "totalpop": 25429 }
{ "_id": { "city": "ABINGTON", "state": "MA", "totalpop": 13849 }
{ "_id": { "city": "ABINGQU", "state": "MN", "totalpop": 1530 }
{ "_id": { "city": "ABITA SPRINGS", "state": "LA", "totalpop": 2659 }
{ "_id": { "city": "ABRAHAM", "state": "WV", "totalpop": 2548 }
{ "_id": { "city": "ABRAHMS", "state": "MT", "totalpop": 1712 }
{ "_id": { "city": "ABSARAKA", "state": "ND", "totalpop": 124 }
{ "_id": { "city": "ABSAROKEE", "state": "MT", "totalpop": 1330 }
{ "_id": { "city": "ACADEMY", "state": "SD", "totalpop": 2425 }
{ "_id": { "city": "ACAPPO", "state": "CA", "totalpop": 7734 }
{ "_id": { "city": "ACCIDENT", "state": "MD", "totalpop": 1968 }
{ "_id": { "city": "ACCOKEEK", "state": "MD", "totalpop": 4043 }
{ "_id": { "city": "ACCOMAC", "state": "VA", "totalpop": 2562 }
```

2. sort the results by population, highest first

```
Command Prompt - mongo
> db.zipcodes.aggregate([{$group: { _id: {city: "$city", state: "$state"}, totalpop: {$sum: "$pop"} }}, {$sort:
: {totalpop: -1}}])
{ "_id" : { "city" : "CHICAGO", "state" : "IL" }, "totalpop" : 2452177 }
{ "_id" : { "city" : "BROOKLYN", "state" : "NY" }, "totalpop" : 2300504 }
{ "_id" : { "city" : "LOS ANGELES", "state" : "CA" }, "totalpop" : 2102295 }
{ "_id" : { "city" : "HOUSTON", "state" : "TX" }, "totalpop" : 2095918 }
{ "_id" : { "city" : "PHILADELPHIA", "state" : "PA" }, "totalpop" : 1610956 }
{ "_id" : { "city" : "NEW YORK", "state" : "NY" }, "totalpop" : 1476790 }
{ "_id" : { "city" : "BRONX", "state" : "NY" }, "totalpop" : 1209548 }
{ "_id" : { "city" : "SAN DIEGO", "state" : "CA" }, "totalpop" : 1049298 }
{ "_id" : { "city" : "DETROIT", "state" : "MI" }, "totalpop" : 963243 }
{ "_id" : { "city" : "DALLAS", "state" : "TX" }, "totalpop" : 940191 }
{ "_id" : { "city" : "PHOENIX", "state" : "AZ" }, "totalpop" : 890853 }
{ "_id" : { "city" : "MIAMI", "state" : "FL" }, "totalpop" : 825232 }
{ "_id" : { "city" : "SAN JOSE", "state" : "CA" }, "totalpop" : 816653 }
{ "_id" : { "city" : "SAN ANTONIO", "state" : "TX" }, "totalpop" : 811792 }
{ "_id" : { "city" : "BALTIMORE", "state" : "MD" }, "totalpop" : 733081 }
{ "_id" : { "city" : "SAN FRANCISCO", "state" : "CA" }, "totalpop" : 723993 }
{ "_id" : { "city" : "MEMPHIS", "state" : "TN" }, "totalpop" : 632837 }
{ "_id" : { "city" : "SACRAMENTO", "state" : "CA" }, "totalpop" : 628279 }
{ "_id" : { "city" : "JACKSONVILLE", "state" : "FL" }, "totalpop" : 610160 }
{ "_id" : { "city" : "ATLANTA", "state" : "GA" }, "totalpop" : 609591 }
type "it" for more
> it
{ "_id" : { "city" : "WASHINGTON", "state" : "DC" }, "totalpop" : 606879 }
{ "_id" : { "city" : "LAS VEGAS", "state" : "NV" }, "totalpop" : 597557 }
{ "_id" : { "city" : "MILWAUKEE", "state" : "WI" }, "totalpop" : 597324 }
{ "_id" : { "city" : "TUCSON", "state" : "AZ" }, "totalpop" : 586451 }
{ "_id" : { "city" : "CLEVELAND", "state" : "OH" }, "totalpop" : 536739 }
{ "_id" : { "city" : "AUSTIN", "state" : "TX" }, "totalpop" : 530049 }
{ "_id" : { "city" : "SEATTLE", "state" : "WA" }, "totalpop" : 520096 }
{ "_id" : { "city" : "COLUMBUS", "state" : "OH" }, "totalpop" : 520096 }
{ "_id" : { "city" : "PORTLAND", "state" : "OR" }, "totalpop" : 518543 }
{ "_id" : { "city" : "EL PASO", "state" : "TX" }, "totalpop" : 511351 }
{ "_id" : { "city" : "TAMPA", "state" : "FL" }, "totalpop" : 498997 }
{ "_id" : { "city" : "NEW ORLEANS", "state" : "LA" }, "totalpop" : 406937 }
{ "_id" : { "city" : "CHARLOTTE", "state" : "NC" }, "totalpop" : 465833 }
{ "_id" : { "city" : "FORT WORTH", "state" : "TX" }, "totalpop" : 451415 }
{ "_id" : { "city" : "DENVER", "state" : "CO" }, "totalpop" : 451182 }
{ "_id" : { "city" : "ALBUQUERQUE", "state" : "NM" }, "totalpop" : 449584 }
{ "_id" : { "city" : "SAINT LOUIS", "state" : "MO" }, "totalpop" : 397802 }
{ "_id" : { "city" : "HONOLULU", "state" : "HI" }, "totalpop" : 396643 }
{ "_id" : { "city" : "ROCHESTER", "state" : "NY" }, "totalpop" : 396013 }
{ "_id" : { "city" : "TULSA", "state" : "OK" }, "totalpop" : 389072 }
type "it" for more
```

3. limit the results to just the first 3 results. What are the top 3 cities in population?

```
Command Prompt - mongo
> db.zipcodes.aggregate([{$group: { _id: {city: "$city", state: "$state"}, totalpop: {$sum: "$pop"} }}, {$sort:
: {totalpop: -1}}, {$limit: 3}])
{ "_id" : { "city" : "CHICAGO", "state" : "IL" }, "totalpop" : 2452177 }
{ "_id" : { "city" : "BROOKLYN", "state" : "NY" }, "totalpop" : 2300504 }
{ "_id" : { "city" : "LOS ANGELES", "state" : "CA" }, "totalpop" : 2102295 }
>
```

4. What are the top 3 cities in population in Texas?

```
Command Prompt - mongo
> db.zipcodes.aggregate([{$group: { _id: {city: "$city", state: "$state"}, totalpop: {$sum: "$pop"} }}, {$sort:
: {totalpop: -1}}, {$match: { "state": "TX" }}, {$limit: 3}])
{ "_id" : { "city" : "HOUSTON", "state" : "TX" }, "totalpop" : 2095918 }
{ "_id" : { "city" : "DALLAS", "state" : "TX" }, "totalpop" : 940191 }
{ "_id" : { "city" : "SAN ANTONIO", "state" : "TX" }, "totalpop" : 811792 }
>
```

Bonus

1. Write a query to get the average city population for each state.

```
Command Prompt - mongo
> db.zipcodes.aggregate([
  ... ($group: {_id: {state: "$state", city: "$city"}, pop: { $sum: "$pop" }}),
  ... ($group: {_id: "$_id.state", avgCityPop: {avg: "$pop" }})
  ... ])
{ "_id" : "GA", "avgCityPop" : 11547.62210338681 }
{ "_id" : "AL", "avgCityPop" : 7907.2152641878665 }
{ "_id" : "SD", "avgCityPop" : 1839.6746031746031 }
{ "_id" : "NC", "avgCityPop" : 10622.815705128205 }
{ "_id" : "LA", "avgCityPop" : 10465.496277915632 }
{ "_id" : "RI", "avgCityPop" : 19292.653846153848 }
{ "_id" : "MI", "avgCityPop" : 2593.987012987013 }
{ "_id" : "IA", "avgCityPop" : 3123.0821147356583 }
{ "_id" : "VT", "avgCityPop" : 2315.8765432098767 }
{ "_id" : "WI", "avgCityPop" : 7323.00748502994 }
{ "_id" : "MA", "avgCityPop" : 12258.670025188916 }
{ "_id" : "MS", "avgCityPop" : 7524.023391812865 }
{ "_id" : "HI", "avgCityPop" : 15831.842857142858 }
{ "_id" : "AK", "avgCityPop" : 2076.4018032786886 }
{ "_id" : "KS", "avgCityPop" : 3819.884259259259 }
{ "_id" : "AR", "avgCityPop" : 4175.355239786856 }
{ "_id" : "NE", "avgCityPop" : 3006.4901960784314 }
{ "_id" : "NY", "avgCityPop" : 13131.680291970803 }
{ "_id" : "FL", "avgCityPop" : 27400.958963282937 }
{ "_id" : "IL", "avgCityPop" : 9271.130434782608 }
type "it" for more
{ "_id" : "PA", "avgCityPop" : 8679.067202337472 }
{ "_id" : "ND", "avgCityPop" : 1645.0309278350514 }
{ "_id" : "NE", "avgCityPop" : 3034.882692307692 }
{ "_id" : "NH", "avgCityPop" : 5372.21375921376 }
{ "_id" : "NV", "avgCityPop" : 18209.590909090908 }
{ "_id" : "OK", "avgCityPop" : 6155.743639921722 }
{ "_id" : "OR", "avgCityPop" : 8262.561046511628 }
{ "_id" : "NH", "avgCityPop" : 5232.320754716981 }
{ "_id" : "CO", "avgCityPop" : 9981.075757575758 }
{ "_id" : "ND", "avgCityPop" : 12615.775725593667 }
{ "_id" : "AZ", "avgCityPop" : 20591.16853932584 }
{ "_id" : "MO", "avgCityPop" : 5672.195338512764 }
{ "_id" : "CT", "avgCityPop" : 14674.625 }
{ "_id" : "TX", "avgCityPop" : 13775.02108678021 }
{ "_id" : "NJ", "avgCityPop" : 15775.89387755102 }
{ "_id" : "CA", "avgCityPop" : 27756.42723880597 }
{ "_id" : "WY", "avgCityPop" : 3384.5373134328356 }
{ "_id" : "DE", "avgCityPop" : 14481.91304347826 }
{ "_id" : "SC", "avgCityPop" : 11139.626198083068 }
{ "_id" : "WA", "avgCityPop" : 14855.37037037037 }
type "it" for more
>
```

2. What are the top 3 states in terms of average city population?

```
Command Prompt - mongo
> db.zipcodes.aggregate([ ($group: {_id: {state: "$state", city: "$city"}, pop: { $sum: "$pop" }}), ($group: {_id: "$_id.state", avgCityPop: {avg: "$pop" }}), ($sort: {avgCityPop: -1}), ($limit: 3) ])
{ "_id" : "DC", "avgCityPop" : 303450 }
{ "_id" : "CA", "avgCityPop" : 27756.42723880597 }
{ "_id" : "FL", "avgCityPop" : 27400.958963282937 }
>
```