

MongoDB -Aggregation Exercises

Atlanta Population

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

Populations By State

1. use `aggregate` to calculate the total population for each state
2. sort the results by population, highest first
3. limit the results to just the first 3 results. What are the top 3 states in population?

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' }`
2. sort the results by population, highest first
3. limit the results to just the first 3 results. What are the top 3 cities in population?
4. What are the top 3 cities in population in Texas?

Bonus

1. Write a query to get the average city population for each state.
2. What are the top 3 states in terms of average city population

> use population

switched to db population

> show collections

Zipcodes

> `db.zipcodes.find({city:"ATLANTA",state:"GA"}).pretty()`

```
{
  "_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"  
}
```

Next Question

```
> db.zipcodes.aggregate({$match:{$and:[{city:"ATLANTA"},{state:"GA"}]}}).pretty()
```

```
{  
  "_id" : "30303",  
  "city" : "ATLANTA",  
  "loc" : [  
    -84.388846,  
    33.752504  
  ],  
  "pop" : 1845,  
  "state" : "GA"  
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```
{  
  "_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",
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"loc" : [  
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  "loc" : [  
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    33.727849  
  ],  
  "pop" : 34017,  
  "state" : "GA"  
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{  
  "_id" : "30311",  
  "city" : "ATLANTA",  
  "loc" : [  
    -84.470219,  
    33.722957  
  ],  
  "pop" : 34880,  
  "state" : "GA"  
}  
{  
  "_id" : "30312",  
  "city" : "ATLANTA",  
  "loc" : [  
    -84.470219,  
    33.722957  
  ],  
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  "state" : "GA"
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        -84.378125,  
        33.746749  
    ],  
    "pop" : 17683,  
    "state" : "GA"  
}  
{  
    "_id" : "30313",  
    "city" : "ATLANTA",  
    "loc" : [  
        -84.39352,  
        33.76825  
    ],  
    "pop" : 8038,  
    "state" : "GA"  
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{  
    "_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" : 15044,  
    "state" : "GA"
```

```

    "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"
}

```

Next Question

```

> db.zipcodes.aggregate([ {$match:{city:"ATLANTA"}}, {$group:{_id:"$city",total:{$sum:"$pop"}}}])
{ "_id" : "ATLANTA", "total" : 630046 }

> db.zipcodes.aggregate([ {$match:{city:"ATLANTA"}},
{$group:{_id:"$city",totalpopulation:{$sum:"$pop"}}}])
{ "_id" : "ATLANTA", "totalpopulation" : 630046 }

> db.zipcodes.aggregate([{$group:{_id:"$state",totalpopulation:{$sum:"$pop"}}}])
{ "_id" : "TN", "totalpopulation" : 4876457 }

```

```
{ "_id" : "OH", "totalpopulation" : 10846517 }
{ "_id" : "MI", "totalpopulation" : 9295297 }
{ "_id" : "MA", "totalpopulation" : 6016425 }
{ "_id" : "ID", "totalpopulation" : 1006749 }
{ "_id" : "MT", "totalpopulation" : 798948 }
{ "_id" : "UT", "totalpopulation" : 1722850 }
{ "_id" : "WI", "totalpopulation" : 4891769 }
{ "_id" : "MS", "totalpopulation" : 2573216 }
{ "_id" : "NV", "totalpopulation" : 1201833 }
{ "_id" : "GA", "totalpopulation" : 6478216 }
{ "_id" : "SD", "totalpopulation" : 695397 }
{ "_id" : "OK", "totalpopulation" : 3145585 }
{ "_id" : "AL", "totalpopulation" : 4040587 }
{ "_id" : "HI", "totalpopulation" : 1108229 }
{ "_id" : "VT", "totalpopulation" : 562758 }
{ "_id" : "ND", "totalpopulation" : 638272 }
{ "_id" : "CO", "totalpopulation" : 3293755 }
{ "_id" : "WA", "totalpopulation" : 4866692 }
{ "_id" : "MO", "totalpopulation" : 5110648 }
```

Next Question

```
> db.zipcodes.aggregate([ {$group: {_id: "$state", totalpop: { $sum: "$pop" } } }, { $sort: { totalpop: -1 } } ]).pretty()
```

```
{ "_id" : "CA", "totalpop" : 29754890 }
{ "_id" : "NY", "totalpop" : 17990402 }
{ "_id" : "TX", "totalpop" : 16984601 }
{ "_id" : "FL", "totalpop" : 12686644 }
{ "_id" : "PA", "totalpop" : 11881643 }
{ "_id" : "IL", "totalpop" : 11427576 }
{ "_id" : "OH", "totalpop" : 10846517 }
{ "_id" : "MI", "totalpop" : 9295297 }
{ "_id" : "NJ", "totalpop" : 7730188 }
```

```
{ "_id" : "NC", "totalpop" : 6628637 }
{ "_id" : "GA", "totalpop" : 6478216 }
{ "_id" : "VA", "totalpop" : 6181479 }
{ "_id" : "MA", "totalpop" : 6016425 }
{ "_id" : "IN", "totalpop" : 5544136 }
{ "_id" : "MO", "totalpop" : 5110648 }
{ "_id" : "WI", "totalpop" : 4891769 }
{ "_id" : "TN", "totalpop" : 4876457 }
{ "_id" : "WA", "totalpop" : 4866692 }
{ "_id" : "MD", "totalpop" : 4781379 }
{ "_id" : "MN", "totalpop" : 4372982 }
```

Next Question

```
> db.zipcodes.aggregate([{$group:{_id:"$state",totalpop:{$sum:"$pop"}}}, {$sort:{totalpop:-1}},{$limit:3}]).pretty()

{ "_id" : "CA", "totalpop" : 29754890 }
{ "_id" : "NY", "totalpop" : 17990402 }
{ "_id" : "TX", "totalpop" : 16984601 }

> db.zipcodes.aggregate([{$group:{_id:{city:"$city",state:"$state"},totalpop:{$sum:"$pop"}}}])

{ "_id" : { "city" : "WEST BROWNSVILLE", "state" : "PA" }, "totalpop" : 9133 }
{ "_id" : { "city" : "CARSON", "state" : "VA" }, "totalpop" : 1343 }
{ "_id" : { "city" : "DACOMA", "state" : "OK" }, "totalpop" : 351 }
{ "_id" : { "city" : "KYKOTSMOVI VILLA", "state" : "AZ" }, "totalpop" : 167 }
{ "_id" : { "city" : "SANTA PAULA", "state" : "CA" }, "totalpop" : 28319 }
{ "_id" : { "city" : "FORESTVILLE", "state" : "CA" }, "totalpop" : 7252 }
{ "_id" : { "city" : "WYNNEWOOD", "state" : "PA" }, "totalpop" : 8285 }
{ "_id" : { "city" : "BRYANT", "state" : "IN" }, "totalpop" : 1350 }
{ "_id" : { "city" : "KENT", "state" : "OR" }, "totalpop" : 0 }
{ "_id" : { "city" : "BLAINE", "state" : "WA" }, "totalpop" : 7057 }
{ "_id" : { "city" : "WINCHESTER", "state" : "IN" }, "totalpop" : 8830 }
{ "_id" : { "city" : "MABTON", "state" : "WA" }, "totalpop" : 3586 }
{ "_id" : { "city" : "STANTON", "state" : "ND" }, "totalpop" : 720 }
```



```
{ "_id" : { "city" : "WARREN", "state" : "CT" }, "totalpop" : 1278 }
{ "_id" : { "city" : "MONT CLARE", "state" : "PA" }, "totalpop" : 1749 }
{ "_id" : { "city" : "BANKSTON", "state" : "AL" }, "totalpop" : 651 }
{ "_id" : { "city" : "FIVE POINTS", "state" : "AL" }, "totalpop" : 2400 }
{ "_id" : { "city" : "CHAMPLAIN", "state" : "VA" }, "totalpop" : 187 }
{ "_id" : { "city" : "SHAW", "state" : "MS" }, "totalpop" : 3596 }
{ "_id" : { "city" : "APPLETON", "state" : "WI" }, "totalpop" : 91117 }
```

Next Question

>

```
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 }
```

Next Question

```

>
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}

>

>
db.zipcodes.aggregate([{$match:{state:"TX"}},{ $group:{_id:{city:"$city"},totalpop:{$sum:"$pop"}},{sort:{totalpop:-1}},{$limit:3}})

{"_id":{"city":"HOUSTON"},"totalpop":2095918}
{"_id":{"city":"DALLAS"},"totalpop":940191}
{"_id":{"city":"SAN ANTONIO"},"totalpop":811792}

>

> db.zipcodes.aggregate([{$group:{_id:{city:"$city",state:"$state"},averagepop:{$avg:"$pop"}}}])

{"_id":{"city":"SOUTH HAVEN","state":"MI"},"averagepop":12604}
{"_id":{"city":"SILSBEE","state":"TX"},"averagepop":27117}
{"_id":{"city":"BANGS","state":"TX"},"averagepop":5681}
{"_id":{"city":"WAITE PARK","state":"MN"},"averagepop":5227}
{"_id":{"city":"MARCY","state":"NY"},"averagepop":7937}
{"_id":{"city":"SANTA FE","state":"FL"},"averagepop":9414}
{"_id":{"city":"GREENVILLE","state":"ME"},"averagepop":2054}
{"_id":{"city":"EDMUNDS","state":"ND"},"averagepop":624}
{"_id":{"city":"MORO","state":"AR"},"averagepop":1571}
{"_id":{"city":"MONETTE","state":"AR"},"averagepop":2008}
{"_id":{"city":"BRAMWELL","state":"WV"},"averagepop":762}
{"_id":{"city":"ELWOOD","state":"NY"},"averagepop":30333}
{"_id":{"city":"ALMA","state":"NY"},"averagepop":200}
{"_id":{"city":"PROVINCETOWN","state":"MA"},"averagepop":3561}
{"_id":{"city":"LORETTO","state":"PA"},"averagepop":2771}
{"_id":{"city":"HILLSBORO","state":"KY"},"averagepop":1981}
{"_id":{"city":"MC CONNELSVILLE","state":"OH"},"averagepop":4784}

```

```
{ "_id" : { "city" : "CADDO MILLS", "state" : "TX" }, "averagepop" : 3148 }  
{ "_id" : { "city" : "DEVILS ELBOW", "state" : "MO" }, "averagepop" : 1717 }  
{ "_id" : { "city" : "EMORY", "state" : "TX" }, "averagepop" : 3919 }
```

Next Question

```
>  
db.zipcodes.aggregate([{$group: {_id: {city: "$city", state: "$state"}, averagepop: {$avg: "$pop"}}}, {$sort: {  
averagepop: -1}}, {$limit: 3}])  
  
{ "_id" : { "city" : "BELL GARDENS", "state" : "CA" }, "averagepop" : 99568 }  
{ "_id" : { "city" : "NORWALK", "state" : "CA" }, "averagepop" : 94188 }  
{ "_id" : { "city" : "ARLETA", "state" : "CA" }, "averagepop" : 88114 }
```