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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.

```
Microsoft Windows [Version 10.0.17763.1577]
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C:\Users\Admin>mongosh "mongodb+srv://population.mkn1.mongodb.net/myFirstDatabase" --username Malavikka
Enter password: *****
Current Mongosh Log ID: 6208e0229a718cf56d0e957
Connecting to:      mongodb+srv://population.mkn1.mongodb.net/myFirstDatabase?appName=mongosh+1.1.9
Using MongoDB:      4.4.12
Using Mongosh:      1.1.9

For mongosh info see: https://docs.mongodb.com/mongosh-shell/

Atlas atlas-fgmVSp-shard-0 [primary] myFirstDatabase> show dbs
populations  2.16 MB
admin        336 kB
local        5.77 GB
Atlas atlas-fgmVSp-shard-0 [primary] myFirstDatabase> use populations
switched to db populations
Atlas atlas-fgmVSp-shard-0 [primary] populations> show collections
zipcode
Atlas atlas-fgmVSp-shard-0 [primary] populations> db.zipcode.find({'$and':[{'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,
```

```
    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'
  }
]
```

```
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate({$match:{$and:[{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'
  },
]
```

```
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$match:{city:"ATLANTA"}},{$group:{_id:"city",total:{$sum:1}}}]
[ { _id: 'city', total: 41 } ]
```

```
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$match:{city:"ATLANTA"}},{$group:{_id:"city",totalpopulation:{$sum:"$pop"}}}])
[ { _id: 'city', totalpopulation: 630046 } ]
```

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?

```
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$group:{_id:"$state",Statepopulation:{$sum:"$pop"}}}])
[
  { _id: 'PA', Statepopulation: 11881643 },
  { _id: 'MO', Statepopulation: 5110648 },
  { _id: 'NE', Statepopulation: 1578139 },
  { _id: 'VA', Statepopulation: 6181479 },
  { _id: 'NY', Statepopulation: 17990402 },
  { _id: 'OR', Statepopulation: 2842321 },
  { _id: 'CT', Statepopulation: 3287116 },
  { _id: 'MD', Statepopulation: 4781379 },
  { _id: 'CO', Statepopulation: 3293755 },
  { _id: 'NJ', Statepopulation: 7730188 },
  { _id: 'ID', Statepopulation: 1006749 },
  { _id: 'TX', Statepopulation: 16984601 },
  { _id: 'WY', Statepopulation: 453528 },
  { _id: 'DC', Statepopulation: 606900 },
  { _id: 'IL', Statepopulation: 11427576 },
  { _id: 'UT', Statepopulation: 1722850 },
  { _id: 'CA', Statepopulation: 29754890 },
  { _id: 'KY', Statepopulation: 3675484 },
  { _id: 'MA', Statepopulation: 6016425 },
  { _id: 'TN', Statepopulation: 4876457 }
]
```

```
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$group:{_id:"$state",Statepopulation:{ $sum:"$pop"} }},{$sort:{Statepopulation:-1}}])
[
  { _id: 'CA', Statepopulation: 29754890 },
  { _id: 'NY', Statepopulation: 17990402 },
  { _id: 'TX', Statepopulation: 16984601 },
  { _id: 'FL', Statepopulation: 12686644 },
  { _id: 'PA', Statepopulation: 11881643 },
  { _id: 'IL', Statepopulation: 11427576 },
  { _id: 'OH', Statepopulation: 10846517 },
  { _id: 'MI', Statepopulation: 9295297 },
  { _id: 'NJ', Statepopulation: 7730188 },
  { _id: 'NC', Statepopulation: 6628637 },
  { _id: 'GA', Statepopulation: 6478216 },
  { _id: 'VA', Statepopulation: 6181479 },
  { _id: 'MA', Statepopulation: 6016425 },
  { _id: 'IN', Statepopulation: 5544136 },
  { _id: 'MO', Statepopulation: 5110648 },
  { _id: 'WI', Statepopulation: 4891769 },
  { _id: 'TN', Statepopulation: 4876457 },
  { _id: 'WA', Statepopulation: 4866692 },
  { _id: 'MD', Statepopulation: 4781379 },
  { _id: 'MN', Statepopulation: 4372982 }
]
Type "it" for more
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$group:{_id:"$state",Statepopulation:{ $sum:"$pop"} }},{$sort:{Statepopulation:-1}},{$limit:3}])
[
  { _id: 'CA', Statepopulation: 29754890 },
  { _id: 'NY', Statepopulation: 17990402 },
  { _id: 'TX', Statepopulation: 16984601 }
]
```

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?

```
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$group:{_id:{city:"$city",state:"$state"},populations:{ $sum:"$pop"} }},{$sort:{populations:-1}},{$limit:3}])
[
  { _id: { city: 'FRIEND', state: 'KS' }, populations: 4476 },
  { _id: { city: 'WILLIAMS AFB', state: 'AZ' }, populations: 2574 },
  { _id: { city: 'MILLERVILLE', state: 'AL' }, populations: 863 },
  { _id: { city: 'SUMMIT', state: 'SD' }, populations: 469 },
  { _id: { city: 'NEW RICHMOND', state: 'MI' }, populations: 438 },
  { _id: { city: 'PONCA CITY', state: 'OK' }, populations: 33674 },
  { _id: { city: 'SPRING CREEK', state: 'PA' }, populations: 191 },
  { _id: { city: 'ELMWOOD PLACE', state: 'OH' }, populations: 10261 },
  { _id: { city: 'SKOWHEGAN', state: 'ME' }, populations: 10166 },
  { _id: { city: 'NEWARK', state: 'NY' }, populations: 14670 },
  { _id: { city: 'BERGENFIELD', state: 'NJ' }, populations: 24613 },
  { _id: { city: 'FRAZIERS BOTTOM', state: 'WV' }, populations: 911 },
  { _id: { city: 'SOUTH ELGIN', state: 'IL' }, populations: 9117 },
  { _id: { city: 'GREENBELT', state: 'MD' }, populations: 21125 },
  { _id: { city: 'DIAMONDHEAD', state: 'MS' }, populations: 20156 },
  { _id: { city: 'GRAND RIDGE', state: 'IL' }, populations: 1179 },
  { _id: { city: 'FISHER', state: 'LA' }, populations: 370 },
  { _id: { city: 'HORNBECK', state: 'LA' }, populations: 1352 },
  { _id: { city: 'ALUM BRIDGE', state: 'WV' }, populations: 1015 },
  { _id: { city: 'KIRKSEY', state: 'KY' }, populations: 3190 }
]
```

```

Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$group: {_id: {city: "$city", state: "$state"}, populations: {$sum: "$pop"} }}, {$sort: {populations: -1}}])
[
  { _id: { city: 'CHICAGO', state: 'IL' }, populations: 2452177 },
  { _id: { city: 'BROOKLYN', state: 'NY' }, populations: 2300504 },
  { _id: { city: 'LOS ANGELES', state: 'CA' }, populations: 2102295 },
  { _id: { city: 'HOUSTON', state: 'TX' }, populations: 2095918 },
  { _id: { city: 'PHILADELPHIA', state: 'PA' }, populations: 1610956 },
  { _id: { city: 'NEW YORK', state: 'NY' }, populations: 1476790 },
  { _id: { city: 'BRONX', state: 'NY' }, populations: 1209548 },
  { _id: { city: 'SAN DIEGO', state: 'CA' }, populations: 1049298 },
  { _id: { city: 'DETROIT', state: 'MI' }, populations: 963243 },
  { _id: { city: 'DALLAS', state: 'TX' }, populations: 940191 },
  { _id: { city: 'PHOENIX', state: 'AZ' }, populations: 890853 },
  { _id: { city: 'MIAMI', state: 'FL' }, populations: 825232 },
  { _id: { city: 'SAN JOSE', state: 'CA' }, populations: 816653 },
  { _id: { city: 'SAN ANTONIO', state: 'TX' }, populations: 811792 },
  { _id: { city: 'BALTIMORE', state: 'MD' }, populations: 733081 },
  { _id: { city: 'SAN FRANCISCO', state: 'CA' }, populations: 723993 },
  { _id: { city: 'MEMPHIS', state: 'TN' }, populations: 632837 },
  { _id: { city: 'SACRAMENTO', state: 'CA' }, populations: 628279 },
  { _id: { city: 'JACKSONVILLE', state: 'FL' }, populations: 610160 },
  { _id: { city: 'ATLANTA', state: 'GA' }, populations: 609591 }
]
Type "it" for more
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$group: {_id: {city: "$city", state: "$state"}, populations: {$sum: "$pop"} }}, {$sort: {populations: -1}}, {$limit: 3}])
[
  { _id: { city: 'CHICAGO', state: 'IL' }, populations: 2452177 },
  { _id: { city: 'BROOKLYN', state: 'NY' }, populations: 2300504 },
  { _id: { city: 'LOS ANGELES', state: 'CA' }, populations: 2102295 }
]
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$match: {state: "TX"}}, {$group: {_id: {city: "$city", state: "$state"}, populations: {$sum: "$pop"} }}, {$sort: {populations: -1}}, {$limit: 3}])
[
  { _id: { city: 'HOUSTON', state: 'TX' }, populations: 2095918 },
  { _id: { city: 'DALLAS', state: 'TX' }, populations: 940191 },
  { _id: { city: 'SAN ANTONIO', state: 'TX' }, populations: 811792 }
]

```

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?

```

Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$group: {_id: "$city", AvgPopulation: {$avg: "$pop"} }}, {$sort: {AvgPopulation: -1}}, {$limit: 3}])
[
  { _id: 'MONTGOMERY CREEK', AvgPopulation: 823 },
  { _id: 'KYLES FORD', AvgPopulation: 931 },
  { _id: 'PILOT MOUND', AvgPopulation: 380 },
  { _id: 'BOX ELDER', AvgPopulation: 2851 },
  { _id: 'MIDWAY CITY', AvgPopulation: 6224 },
  { _id: 'LANDESS', AvgPopulation: 3670 },
  { _id: 'TOWNSHEND', AvgPopulation: 920 },
  { _id: 'GURDON', AvgPopulation: 4180 },
  { _id: 'DAYVILLE', AvgPopulation: 3002 },
  { _id: 'OLD TOWN', AvgPopulation: 7004.333333333333 },
  { _id: 'BEAUMONT', AvgPopulation: 12111.5 },
  { _id: 'WEEMS', AvgPopulation: 2125 },
  { _id: 'TROUP', AvgPopulation: 8363 },
  { _id: 'NORTH WATERBORO', AvgPopulation: 1516 },
  { _id: 'OCHEYEDAN', AvgPopulation: 1596 },
  { _id: 'FRUITDALE', AvgPopulation: 541 },
  { _id: 'MILANVILLE', AvgPopulation: 922 },
  { _id: 'LOST NATION', AvgPopulation: 768 },
  { _id: 'CARLSBAD', AvgPopulation: 24111 },
  { _id: 'KRAMER', AvgPopulation: 145 }
]
Type "it" for more
Atlas atlas-fgmV5p-shard-0 [primary] populations> db.zipcode.aggregate([{$group: {_id: "$city", AvgPopulation: {$avg: "$pop"} }}, {$sort: {AvgPopulation: -1}}, {$limit: 3}])
[
  { _id: 'BELL GARDENS', AvgPopulation: 99568 },
  { _id: 'ARLETA', AvgPopulation: 88114 },
  { _id: 'SOUTH GATE', AvgPopulation: 87026 }
]
Atlas atlas-fgmV5p-shard-0 [primary] populations>

```