

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.

```
Ctrl Select mongosh mongodb+srv://test.hftd7.mongodb.net/myFirstDatabase
switched to db population
Atlas atlas-w4167a-shard-0 [primary] population> 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,

```

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

```

]
Type "it" for more
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate({$match:{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',

```

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

```

Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate(
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$match:{city:"ATLANTA"}},{ $group:{_id:"city",count:{$sum:1}}}] );
[ { _id: 'city', count: 41 } ]
Atlas atlas-w4167a-shard-0 [primary] population>

```

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

```

Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate(
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$match:{city:"ATLANTA"}},{ $group:{_id:"city",totalpopulation:{$sum: "$pop"}}}] );
[ { _id: 'city', totalpopulation: 630046 } ]
Atlas atlas-w4167a-shard-0 [primary] population>

```

Populations By State

1. use aggregate to calculate the total population for each state
2. sort the results by population, highest first

```
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$group:{_id:"$state",count:{$sum:"$pop"}}}]);
[
  { _id: 'AR', count: 2350725 },
  { _id: 'NJ', count: 7730188 },
  { _id: 'OH', count: 10846517 },
  { _id: 'CT', count: 3287116 },
  { _id: 'MD', count: 4781379 },
  { _id: 'WI', count: 4891769 },
  { _id: 'FL', count: 12686644 },
  { _id: 'NY', count: 17990402 },
  { _id: 'MA', count: 6016425 },
  { _id: 'ND', count: 638272 },
  { _id: 'MT', count: 798948 },
  { _id: 'KS', count: 2475285 },
  { _id: 'NE', count: 1578139 },
  { _id: 'GA', count: 6478216 },
  { _id: 'RI', count: 1003218 },
  { _id: 'AL', count: 4040587 },
  { _id: 'AR', count: 2350725 },
  { _id: 'DC', count: 606900 },
  { _id: 'CO', count: 3293755 },
  { _id: 'WY', count: 453528 },
  { _id: 'UT', count: 1722850 }
]
Type "it" for more
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$group:{_id:"$state",count:{$sum:"$pop"}},{ $sort:{count:-1}}]);
[
  { _id: 'CA', count: 29754890 },
  { _id: 'NY', count: 17990402 },
  { _id: 'TX', count: 16984601 },
  { _id: 'FL', count: 12686644 },
  { _id: 'PA', count: 11881643 },
  { _id: 'IL', count: 11427576 },
  { _id: 'OH', count: 10846517 },
  { _id: 'MI', count: 9295297 },
  { _id: 'NJ', count: 7730188 },
  { _id: 'NC', count: 6628637 },
  { _id: 'GA', count: 6478216 },
  { _id: 'VA', count: 6181479 },
  { _id: 'MA', count: 6016425 },
  { _id: 'IN', count: 5544136 },
  { _id: 'MO', count: 5110648 },
  { _id: 'WI', count: 4891769 },
  { _id: 'TN', count: 4876457 },
  { _id: 'WA', count: 4866692 },
  { _id: 'MD', count: 4781379 },
  { _id: 'MN', count: 4372982 }
]
Type "it" for more
```

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

```
Type "it" for more
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$group:{_id:"$state",count:{$sum:"$pop"}},{ $sort:{count:-1}},{$limit:3}]);
[
  { _id: 'CA', count: 29754890 },
  { _id: 'NY', count: 17990402 },
  { _id: 'TX', count: 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

```
mongosh mongodb+srv://test:hfd7.mongodb.net/myFirstDatabase
```

```
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$group:{_id:{City:"$city",State:"$state"},population:{$sum:"$pop"}}}]);
[
  { _id: { City: 'GARRYMEN', State: 'MT' }, population: 428 },
  { _id: { City: 'MC MILLAN', State: 'MI' }, population: 897 },
  { _id: { City: 'BOURBON', State: 'MO' }, population: 4456 },
  { _id: { City: 'STAMPING GROUND', State: 'KY' }, population: 3757 },
  { _id: { City: 'WELEETKA', State: 'OK' }, population: 2133 },
  { _id: { City: 'ETHEL', State: 'MS' }, population: 2047 },
  { _id: { City: 'BOY RIVER', State: 'MN' }, population: 132 },
  { _id: { City: 'ASHFIELD', State: 'MA' }, population: 1535 },
  { _id: { City: 'SKIPPERVILLE', State: 'AL' }, population: 1048 },
  { _id: { City: 'ADAMSVILLE', State: 'OH' }, population: 943 },
  { _id: { City: 'BEDROCK', State: 'CO' }, population: 191 },
  { _id: { City: 'HIGHLAND HOME', State: 'AI' }, population: 3068 },
  { _id: { City: 'ALVA', State: 'OK' }, population: 6376 },
  { _id: { City: 'CHAUNCEY', State: 'GA' }, population: 1954 },
  { _id: { City: 'UPPER ARLINGTON', State: 'OH' }, population: 21283 },
  { _id: { City: 'CLAXTON', State: 'GA' }, population: 8724 },
  { _id: { City: 'CREWE', State: 'VA' }, population: 5565 },
  { _id: { City: 'ARLINGTON', State: 'IN' }, population: 1194 },
  { _id: { City: 'PORT MURRAY', State: 'NJ' }, population: 2124 },
  { _id: { City: 'LAS VEGAS', State: 'NV' }, population: 597557 }
]
Type "it" for more
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$group:{_id:{City:"$city",State:"$state"},population:{$sum:"$pop"}}},{ $sort:{population:-1}}]);
[
  { _id: { City: 'CHICAGO', State: 'IL' }, population: 2452177 },
  { _id: { City: 'BROOKLYN', State: 'NY' }, population: 2300504 },
  { _id: { City: 'LOS ANGELES', State: 'CA' }, population: 2102295 },
  { _id: { City: 'HOUSTON', State: 'TX' }, population: 2095918 },
  { _id: { City: 'PHILADELPHIA', State: 'PA' }, population: 1610956 },
  { _id: { City: 'NEW YORK', State: 'NY' }, population: 1476790 },
  { _id: { City: 'BRONX', State: 'NY' }, population: 1209548 },
  { _id: { City: 'SAN DIEGO', State: 'CA' }, population: 1049298 },
  { _id: { City: 'DETROIT', State: 'MI' }, population: 963243 },
  { _id: { City: 'DALLAS', State: 'TX' }, population: 940191 },
  { _id: { City: 'PHOENIX', State: 'AZ' }, population: 890853 },
  { _id: { City: 'MIAMI', State: 'FL' }, population: 825232 },
  { _id: { City: 'SAN JOSE', State: 'CA' }, population: 816653 },
  { _id: { City: 'SAN ANTONIO', State: 'TX' }, population: 811792 },
  { _id: { City: 'BALTIMORE', State: 'MD' }, population: 733081 },
  { _id: { City: 'SAN FRANCISCO', State: 'CA' }, population: 723993 },
  { _id: { City: 'MEMPHIS', State: 'TN' }, population: 632837 },
  { _id: { City: 'SACRAMENTO', State: 'CA' }, population: 628279 },
  { _id: { City: 'JACKSONVILLE', State: 'FL' }, population: 610160 },
  { _id: { City: 'ATLANTA', State: 'GA' }, population: 609591 }
]
Type "it" for more
Atlas atlas-w4167a-shard-0 [primary] population>
```

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

```
mongosh mongodb+srv://test:hfd7.mongodb.net/myFirstDatabase
```

```
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$group:{_id:{City:"$city",State:"$state"},population:{$sum:"$pop"}}},{ $sort:{population:-1}},{ $limit:3}]);
[
  { _id: { City: 'CHICAGO', State: 'IL' }, population: 2452177 },
  { _id: { City: 'BROOKLYN', State: 'NY' }, population: 2300504 },
  { _id: { City: 'LOS ANGELES', State: 'CA' }, population: 2102295 }
]
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$group:{_id:{City:"$city"},population:{$sum:"$pop"}}},{ $sort:{population:-1}},{ $limit:3}]);
[
  { _id: { City: 'CHICAGO' }, population: 2452177 },
  { _id: { City: 'BROOKLYN' }, population: 2341387 },
  { _id: { City: 'HOUSTON' }, population: 2123053 }
]
Type "it" for more
```

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

```
mongosh mongodb+srv://test:hfd7.mongodb.net/myFirstDatabase
```

```
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$match:{state:"TX"}},{ $group:{_id:"$city",population:{$sum:"$pop"}}},{ $sort:{population:-1}}]);
{
  _id: { state: 'CA', city: 'RICHMOND' },
  Avgpop: 23426.666666666668
}
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$match:{state:"TX"}},{ $group:{_id:"$city",population:{$sum:"$pop"}}},{ $sort:{population:-1}},{ $limit:3}]);
[
  { _id: 'HOUSTON', population: 2095918 },
  { _id: 'DALLAS', population: 940191 },
  { _id: 'SAN ANTONIO', population: 811792 },
  { _id: 'AUSTIN', population: 530049 },
  { _id: 'EL PASO', population: 511351 },
  { _id: 'FORT WORTH', population: 451415 },
  { _id: 'ARLINGTON', population: 260013 },
  { _id: 'CORPUS CHRISTI', population: 261612 },
  { _id: 'LUBBOCK', population: 201288 },
  { _id: 'GARLAND', population: 180453 },
  { _id: 'AMARILLO', population: 173158 },
  { _id: 'IRVING', population: 154459 },
  { _id: 'BROWNSVILLE', population: 129554 },
  { _id: 'PLANO', population: 128016 },
  { _id: 'BEAUMONT', population: 126988 },
  { _id: 'PASADENA', population: 117441 },
  { _id: 'ODESSA', population: 116956 },
  { _id: 'TYLER', population: 108023 },
  { _id: 'MIDLAND', population: 106611 },
  { _id: 'ADILENE', population: 104462 }
]
Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{$match:{state:"TX"}},{ $group:{_id:"$city",population:{$sum:"$pop"}}},{ $sort:{population:-1}},{ $limit:3}]);
[
  { _id: 'HOUSTON', population: 2095918 },
  { _id: 'DALLAS', population: 940191 },
  { _id: 'SAN ANTONIO', population: 811792 }
]
Atlas atlas-w4167a-shard-0 [primary] population>
```

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-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{\$group:{\$_id:{\$state:"\$state",city:"\$city"},avgcity:{\$avg:{\$pop}}}}])

```
[
  { _id: { state: 'IN', city: 'HOME' }, avgcity: 6040 },
  { _id: { state: 'IA', city: 'LINEVILLE' }, avgcity: 586 },
  { _id: { state: 'MN', city: 'MINNEOTA' }, avgcity: 2056 },
  { _id: { state: 'KY', city: 'OKOLONA' }, avgcity: 32443.5 },
  { _id: { state: 'MI', city: 'GOULD CITY' }, avgcity: 615 },
  { _id: { state: 'SD', city: 'HERRID' }, avgcity: 829 },
  { _id: { state: 'NY', city: 'ROSLYN' }, avgcity: 13114 },
  { _id: { state: 'MO', city: 'KNOX CITY' }, avgcity: 547 },
  { _id: { state: 'MO', city: 'ASHLAND' }, avgcity: 2989 },
  { _id: { state: 'NE', city: 'PONCA' }, avgcity: 1316 },
  { _id: { state: 'KS', city: 'LURAY' }, avgcity: 339 },
  { _id: { state: 'TX', city: 'ORANGE GROVE' }, avgcity: 4339 },
  { _id: { state: 'KS', city: 'BELVUE' }, avgcity: 321 },
  { _id: { state: 'CO', city: 'DOLORES' }, avgcity: 1770 },
  { _id: { state: 'MI', city: 'LENNON' }, avgcity: 3778 },
  { _id: { state: 'IA', city: 'DANVILLE' }, avgcity: 1694 },
  { _id: { state: 'AZ', city: 'MOBILE' }, avgcity: 5026 },
  { _id: { state: 'IL', city: 'BRACEVILLE' }, avgcity: 1535 },
  { _id: { state: 'IA', city: 'VINITING' }, avgcity: 244 },
  { _id: { state: 'TX', city: 'NAVASOTA' }, avgcity: 12634 }
]
```

Type "it" for more

Atlas atlas-w4167a-shard-0 [primary] population> db.zipcodes.aggregate([{\$group:{\$_id:{\$state:"\$state",city:"\$city"},avgcity:{\$avg:{\$pop}}}},{\$sort:{\$avgcity:-1}},{\$limit:3}])

```
[
  { _id: { state: 'CA', city: 'BELL GARDENS' }, avgcity: 99568 },
  { _id: { state: 'CA', city: 'NORWALK' }, avgcity: 94188 },
  { _id: { state: 'CA', city: 'ARLETA' }, avgcity: 88114 }
]
```

Atlas atlas-w4167a-shard-0 [primary] population> _