ATLANTA POPULATION

1. Use db.zipcodes.find() to ..... where city is ATLANTA and state is GA

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.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, "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
```

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

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> 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", "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
```

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

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$group: {_id:{"city":"$city", zipcode:"$_id" }}},{$match: {"_id.city":"ATLANTA"}},{$count:"zipcode"}])
{ "zipcode" : 41 }
```

4. Use $group to find the total population in Atlanta

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$match: {city: "ATLANTA"}},{$group: {_id:"$city","total population":{$sum:"$pop"}}}])
{ "_id" : "ATLANTA", "total population" : 630046 }
```

BY STATE

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

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$group: {_id: {city:"$city",state:"$state"}, population: {$sum:"$pop"}}},
... {$group: {_id:"$_id.state",Avg_population_city: {$avg: "$population"}}}])
{ "_id" : "KY", "Avg_population_city" : 4767.164721141375 }
{ "_id" : "MI", "Avg_population_city" : 12087.512353706112 }
{ "_id" : "MN", "Avg_population_city" : 5372.21375921376 }
{ "_id" : "OR", "Avg_population_city" : 8262.561046511628 }
{ "_id" : "WV", "Avg_population_city" : 2771.4775888717154 }
{ "_id" : "VA", "Avg_population_city" : 8526.177931034483 }
{ "_id" : "PA", "Avg_population_city" : 8679.067202337472 }
{ "_id" : "MS", "Avg_population_city" : 7524.023391812865 }
{ "_id" : "OK", "Avg_population_city" : 6155.743639921722 }
{ "_id" : "NC", "Avg_population_city" : 10622.815705128205 }
{ "_id" : "NV", "Avg_population_city" : 18209.590909090908 }
{ "_id" : "LA", "Avg_population_city" : 10465.496277915632 }
{ "_id" : "SD", "Avg_population_city" : 1839.6746031746031 }
{ "_id" : "NM", "Avg_population_city" : 5872.360465116279 }
{ "_id" : "ND", "Avg_population_city" : 1645.0309278350514 }
{ "_id" : "AK", "Avg_population_city" : 2976.4918032786886 }
{ "_id" : "IL", "Avg_population_city" : 9954.334494773519 }
{ "_id" : "IA", "Avg_population_city" : 3123.0821147356583 }
{ "_id" : "VT", "Avg_population_city" : 2315.8765432098767 }
{ "_id" : "WI", "Avg_population_city" : 7323.00748502994 }
```

2. sort the results by population, highest first

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$group: {_id:"$state", Population: {$sum:"$pop"}}}, {$sort: {Population: -1}}])
{ "_id" : "CA", "Population" : 29754890 }
{ "_id" : "NY", "Population" : 17990402 }
{ "_id" : "TX", "Population" : 16984601 }
{ "_id" : "FL", "Population" : 12686644 }
{ "_id" : "PA", "Population" : 11881643 }
{ "_id" : "IL", "Population" : 11427576 }
{ "_id" : "OH", "Population" : 10846517 }
{ "_id" : "MI", "Population" : 9295297 }
{ "_id" : "NJ", "Population" : 7730188 }
{ "_id" : "NC", "Population" : 6628637 }
{ "_id" : "GA", "Population" : 6478216 }
{ "_id" : "VA", "Population" : 6181479 }
{ "_id" : "MA", "Population" : 6016425 }
{ "_id" : "IN", "Population" : 5544136 }
{ "_id" : "MO", "Population" : 5110648 }
{ "_id" : "WI", "Population" : 4891769 }
{ "_id" : "TN", "Population" : 4876457 }
{ "_id" : "WA", "Population" : 4866692 }
{ "_id" : "MD", "Population" : 4781379 }
{ "_id" : "MN", "Population" : 4372982 }
```

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

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$group: {_id:"$state", Population: {$sum:"$pop"}}}, {$sort: {Population: -1}}, {$limit: 3}])
{ "_id" : "CA", "Population" : 29754890 }
{ "_id" : "NY", "Population" : 17990402 }
{ "_id" : "TX", "Population" : 16984601 }
```

BY CITY

1. use aggregate to calculate …… $group: {city: '$city', state: '$state'}

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$group: {_id: {city:"$city", state:"$state"},population: {$sum:"$pop"}}}])
{ "_id" : { "city" : "SANIBEL", "state" : "FL" }, "population" : 5999 }
{ "_id" : { "city" : "MAPLE HILL", "state" : "CT" }, "population" : 29192 }
{ "_id" : { "city" : "DANVILLE", "state" : "IL" }, "population" : 49857 }
{ "_id" : { "city" : "HERBSTER", "state" : "WI" }, "population" : 230 }
{ "_id" : { "city" : "STAPLEHURST", "state" : "NE" }, "population" : 597 }
{ "_id" : { "city" : "TRYON", "state" : "NE" }, "population" : 546 }
{ "_id" : { "city" : "MILLTOWN", "state" : "WI" }, "population" : 1570 }
{ "_id" : { "city" : "ABSAROKEE", "state" : "MT" }, "population" : 1330 }
{ "_id" : { "city" : "CHAMOIS", "state" : "MO" }, "population" : 986 }
{ "_id" : { "city" : "ONIDA", "state" : "SD" }, "population" : 1500 }
{ "_id" : { "city" : "GRANITEVILLE", "state" : "MA" }, "population" : 16430 }
{ "_id" : { "city" : "MEADOWBROOK", "state" : "WV" }, "population" : 1373 }
{ "_id" : { "city" : "VIBORG", "state" : "SD" }, "population" : 1664 }
{ "_id" : { "city" : "WESTFORD", "state" : "NY" }, "population" : 253 }
{ "_id" : { "city" : "SCOTTS HILL", "state" : "TN" }, "population" : 1657 }
{ "_id" : { "city" : "COSHOCTON", "state" : "OH" }, "population" : 21561 }
{ "_id" : { "city" : "ESSEX", "state" : "MO" }, "population" : 1212 }
{ "_id" : { "city" : "CLAYTON", "state" : "OK" }, "population" : 1635 }
{ "_id" : { "city" : "DAWSON", "state" : "MN" }, "population" : 2496 }
{ "_id" : { "city" : "IMPERIAL", "state" : "NE" }, "population" : 2372 }
Type "it" for more
```

2. sort the results by population, highest first

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$group: {_id:"$state", Population: {$sum:"$pop"}}}, {$sort: {Population: -1}}])
{ "_id" : "CA", "Population" : 29754890 }
{ "_id" : "NY", "Population" : 17990402 }
{ "_id" : "TX", "Population" : 16984601 }
{ "_id" : "FL", "Population" : 12686644 }
{ "_id" : "PA", "Population" : 11881643 }
{ "_id" : "IL", "Population" : 11427576 }
{ "_id" : "OH", "Population" : 10846517 }
{ "_id" : "MI", "Population" : 9295297 }
{ "_id" : "NJ", "Population" : 7730188 }
{ "_id" : "NC", "Population" : 6628637 }
{ "_id" : "GA", "Population" : 6478216 }
{ "_id" : "VA", "Population" : 6181479 }
{ "_id" : "MA", "Population" : 6016425 }
{ "_id" : "IN", "Population" : 5544136 }
{ "_id" : "MO", "Population" : 5110648 }
{ "_id" : "WI", "Population" : 4891769 }
{ "_id" : "TN", "Population" : 4876457 }
{ "_id" : "WA", "Population" : 4866692 }
{ "_id" : "MD", "Population" : 4781379 }
{ "_id" : "MN", "Population" : 4372982 }
```

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

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> 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 }
```

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

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$match: {state:"TX"}},{$group: {_id:{city:"$city",state:"$state"},population:{$sum:"$pop"}}},{$sort:{population:-1}},{$limit:3}])
{ "_id" : { "city" : "HOUSTON", "state" : "TX" }, "population" : 2095918 }
{ "_id" : { "city" : "DALLAS", "state" : "TX" }, "population" : 940191 }
{ "_id" : { "city" : "SAN ANTONIO", "state" : "TX" }, "population" : 811792 }
```

BONUS

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

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$group: {_id: {city:"$city",state:"$state"}, population: {$sum:"$pop"}}},
... {$group: {_id:"$_id.state",Avg_population_city: {$avg: "$population"}}}])
{ "_id" : "KY", "Avg_population_city" : 4767.164721141375 }
{ "_id" : "MI", "Avg_population_city" : 12087.512353706112 }
{ "_id" : "MN", "Avg_population_city" : 5372.21375921376 }
{ "_id" : "OR", "Avg_population_city" : 8262.561046511628 }
{ "_id" : "WV", "Avg_population_city" : 2771.4775888717154 }
{ "_id" : "VA", "Avg_population_city" : 8526.177931034483 }
{ "_id" : "PA", "Avg_population_city" : 8679.067202337472 }
{ "_id" : "MS", "Avg_population_city" : 7524.023391812865 }
{ "_id" : "OK", "Avg_population_city" : 6155.743639921722 }
{ "_id" : "NC", "Avg_population_city" : 10622.815705128205 }
{ "_id" : "NV", "Avg_population_city" : 18209.590909090908 }
{ "_id" : "LA", "Avg_population_city" : 10465.496277915632 }
{ "_id" : "SD", "Avg_population_city" : 1839.6746031746031 }
{ "_id" : "NM", "Avg_population_city" : 5872.360465116279 }
{ "_id" : "ND", "Avg_population_city" : 1645.0309278350514 }
{ "_id" : "AK", "Avg_population_city" : 2976.4918032786886 }
{ "_id" : "IL", "Avg_population_city" : 9954.334494773519 }
{ "_id" : "IA", "Avg_population_city" : 3123.0821147356583 }
{ "_id" : "VT", "Avg_population_city" : 2315.8765432098767 }
{ "_id" : "WI", "Avg_population_city" : 7323.00748502994 }
```

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

```
MongoDB Enterprise atlas-axfr16-shard-0:PRIMARY> db.zipcodes.aggregate([{$group: {_id: {state:"$state", city:"$city"}, population: {$sum:"$pop"}}}, {$group: {_id:"$_id.state",Avg_population_city: {$avg: "$popula
tion"}}},{$sort: {Avg_population_city:-1}}, {$limit: 3}])
{ "_id" : "DC", "Avg_population_city" : 303450 }
{ "_id" : "CA", "Avg_population_city" : 27756.42723880597 }
{ "_id" : "FL", "Avg_population_city" : 27400.95896328293 7 }
```

// TOP 3 STATES IN TERMS OF AVERAGE CITY POPULATION: DC, CA, FL