Aggregation Assignment

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

```
mongosh mongodb+srv://cluster0.t2hj7.mongodb.net/myFirstDatabase
Atlas atlas-maqh63-shard-0 [primary] population> 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: '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: '30307',
    city: 'ATLANTA',
    loc: [ -84.335957, 33.769138 ],
    pop: 16330,
    state: 'GA'
  },
```

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

```
mongosh mongodb+srv://cluster0.t2hj7.mongodb.net/myFirstDatabase
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.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: '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: '30307',
    city: 'ATLANTA',
    loc: [ -84.335957, 33.769138 ],
    pop: 16330,
    state: 'GA'
  },
```

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

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

```
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate([{$match:{city:'ATLANTA'}},{$group:{_id:"$city",count:{$sum : 1}}}])
[ { _id: 'ATLANTA', count: 41 } ]
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate([{$match:{city:'ATLANTA'}},{$group:{_id:"$city",count:{$sum : "$pop"}}}])
[ { _id: 'ATLANTA', count: 630046 } ]
```

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

6. sort the results by population, highest first

```
mongosh mongodb+srv://cluster0.t2hj7.mongodb.net/myFirstDatabase
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate([{$group: {_id:'$state',pop:{$sum:"$pop"}}}])
[
  { _id: 'PA', pop: 11881643 },
  { _id: 'SC', pop: 3486703 },
  { _id: 'OR', pop: 2842321 },
  { _id: 'NY', pop: 17990402 },
  { _id: 'MT', pop: 798948 },
  { _id: 'MO', pop: 5110648 },
  { _id: 'RI', pop: 1003218 },
  { _id: 'CT', pop: 3287116 },
  { _id: 'MD', pop: 4781379 },
  { _id: 'NJ', pop: 7730188 },
  { _id: 'ND', pop: 638272 },
  { _id: 'AL', pop: 4040587 },
  { _id: 'KS', pop: 2475285 },
  { _id: 'GA', pop: 6478216 },
  { _id: 'WI', pop: 4891769 },
  { _id: 'CO', pop: 3293755 },
  { _id: 'DC', pop: 606900 },
  { _id: 'WY', pop: 453528 },
  { _id: 'CA', pop: 29754890 },
  { _id: 'KY', pop: 3675484 }
]
Type "it" for more
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate([{$group: {_id:'$state',pop:{$sum:"$pop"}}},{$sort : 1}])
MongoServerError: the $sort key specification must be an object
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate([{$group: {_id:'$state',pop:{$sum:"$pop"}}},{$sort : {pop : -1}}])
[
  { _id: 'CA', pop: 29754890 },
  { _id: 'NY', pop: 17990402 },
  { _id: 'TX', pop: 16984601 },
  { _id: 'FL', pop: 12686644 },
  { _id: 'PA', pop: 11881643 },
  { _id: 'IL', pop: 11427576 },
  { _id: 'OH', pop: 10846517 },
  { _id: 'MI', pop: 9295297 },
  { _id: 'NJ', pop: 7730188 },
  { _id: 'NC', pop: 6628637 },
  { _id: 'GA', pop: 6478216 },
  { _id: 'VA', pop: 6181479 },
  { _id: 'MA', pop: 6016425 },
  { _id: 'IN', pop: 5544136 },
  { _id: 'MO', pop: 5110648 },
  { _id: 'WI', pop: 4891769 },
  { _id: 'TN', pop: 4876457 },
  { _id: 'WA', pop: 4866692 },
  { _id: 'MD', pop: 4781379 },
  { _id: 'MN', pop: 4372982 }
]
```

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

```
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate([{$group: {_id:'$state',pop:{$sum:"$pop"}}},{$sort : {pop : -1}},{$limit : 3}])
[
  { _id: 'CA', pop: 29754890 },
  { _id: 'NY', pop: 17990402 },
  { _id: 'TX', pop: 16984601 }
]
```

8. 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' }

```
mongosh mongodb+srv://cluster0.t2hj7.mongodb.net/myFirstDatabase
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate( [
...     { $group:
.....         {
.......             _id: { state: "$state", city: "$city" },
.......             pop: { $sum: "$pop" }
.......         }
.....     }
...
...
...
...
... ])
[
  { _id: { state: 'SC', city: 'NICHOLS' }, pop: 1258 },
  { _id: { state: 'MO', city: 'LESLIE' }, pop: 1238 },
  { _id: { state: 'NY', city: 'PALATINE BRIDGE' }, pop: 1738 },
  { _id: { state: 'LA', city: 'WISNER' }, pop: 4116 },
  { _id: { state: 'MI', city: 'INKSTER' }, pop: 30772 },
  { _id: { state: 'KS', city: 'AMERICUS' }, pop: 1491 },
  { _id: { state: 'MN', city: 'NORWOOD' }, pop: 1761 },
  { _id: { state: 'OK', city: 'HEADRICK' }, pop: 1903 },
  { _id: { state: 'ID', city: 'MOUNTAIN HOME A' }, pop: 6304 },
  { _id: { state: 'CA', city: 'CARMEL' }, pop: 15293 },
  { _id: { state: 'SD', city: 'WATERTOWN' }, pop: 20148 },
  { _id: { state: 'AZ', city: 'SUPAI' }, pop: 423 },
  { _id: { state: 'CA', city: 'PRATHER' }, pop: 1446 },
  { _id: { state: 'CA', city: 'LINCOLN' }, pop: 11935 },
  { _id: { state: 'PA', city: 'DUDLEY' }, pop: 616 },
  { _id: { state: 'TN', city: 'TURTLETOWN' }, pop: 910 },
  { _id: { state: 'MN', city: 'RICE' }, pop: 4560 },
  { _id: { state: 'IN', city: 'JONESBORO' }, pop: 3989 },
  { _id: { state: 'AR', city: 'NEWHOPE' }, pop: 400 },
  { _id: { state: 'OK', city: 'ARCADIA' }, pop: 697 }
]
```

9. sort the results by population, highest first

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

```
mongosh mongodb+srv://cluster0.t2hj7.mongodb.net/myFirstDatabase
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate([ { $group: { _id: { state: "$state", city: "$city" }, pop: { $sum: "$pop" } } },{$sort:{pop : -1}}])
[
  { _id: { state: 'IL', city: 'CHICAGO' }, pop: 2452177 },
  { _id: { state: 'NY', city: 'BROOKLYN' }, pop: 2300504 },
  { _id: { state: 'CA', city: 'LOS ANGELES' }, pop: 2102295 },
  { _id: { state: 'TX', city: 'HOUSTON' }, pop: 2095918 },
  { _id: { state: 'PA', city: 'PHILADELPHIA' }, pop: 1610956 },
  { _id: { state: 'NY', city: 'NEW YORK' }, pop: 1476790 },
  { _id: { state: 'NY', city: 'BRONX' }, pop: 1209548 },
  { _id: { state: 'CA', city: 'SAN DIEGO' }, pop: 1049298 },
  { _id: { state: 'MI', city: 'DETROIT' }, pop: 963243 },
  { _id: { state: 'TX', city: 'DALLAS' }, pop: 940191 },
  { _id: { state: 'AZ', city: 'PHOENIX' }, pop: 890853 },
  { _id: { state: 'FL', city: 'MIAMI' }, pop: 825232 },
  { _id: { state: 'CA', city: 'SAN JOSE' }, pop: 816653 },
  { _id: { state: 'TX', city: 'SAN ANTONIO' }, pop: 811792 },
  { _id: { state: 'MD', city: 'BALTIMORE' }, pop: 733081 },
  { _id: { state: 'CA', city: 'SAN FRANCISCO' }, pop: 723993 },
  { _id: { state: 'TN', city: 'MEMPHIS' }, pop: 632837 },
  { _id: { state: 'CA', city: 'SACRAMENTO' }, pop: 628279 },
  { _id: { state: 'FL', city: 'JACKSONVILLE' }, pop: 610160 },
  { _id: { state: 'GA', city: 'ATLANTA' }, pop: 609591 }
]
Type "it" for more
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate([ { $group: { _id: { state: "$state", city: "$city" }, pop: { $sum: "$pop" } } },{$sort:{pop : -1}},{$limit : 3}])
[
  { _id: { state: 'IL', city: 'CHICAGO' }, pop: 2452177 },
  { _id: { state: 'NY', city: 'BROOKLYN' }, pop: 2300504 },
  { _id: { state: 'CA', city: 'LOS ANGELES' }, pop: 2102295 }
]
```

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

```
Atlas atlas-maqh63-shard-0 [primary] population> db.zipcodes.aggregate([{$match :{state : 'TX'}},{$group:{_id:"$city",pop:{$sum:"$pop"}}},{$sort:{pop:-1}},{$limit:3}])
[
  { _id: 'HOUSTON', pop: 2095918 },
  { _id: 'DALLAS', pop: 940191 },
  { _id: 'SAN ANTONIO', pop: 811792 }
]
```