**A2 MongoDB Aggregation Assignment**

**Atlanta Population**

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

db.zipcodes.find({$and:[{city:"ATLANTA"},{state:"GA"}]})

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

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

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

db.zipcodes.aggregate([{$match:{city:"ATLANTA"}},{$group:{\_id:"$city", zipcodes:{$sum:1}}}])

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

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

**Populations By State**

*Query 1: use aggregate to calculate the total population for each state*

db.zipcodes.aggregate([{$group:{\_id:"$state", totalPopulation:{$sum:"$pop"}}}])

*Query 2: sort the results by population, highest first*

db.zipcodes.aggregate([{$group:{\_id:"$state",

totalPopulation:{$sum:"$pop"}}},{$sort:{totalPopulation:-1}}])

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

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

Therefore, the top 3 states in population are: CA, NY and TX.

**Populations By City**

*Query 1: use aggregate to calculate the total population for each city*

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

*Query 2: sort the results by population, highest first*

db.zipcodes.aggregate([{$group:{\_id:{city:"$city", state:"$state"}, population:{$sum:"$pop"}}},{$sort:{population:-1}}])

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

db.zipcodes.aggregate([{$group:{\_id:{city:"$city", state:"$state"}, population:{$sum:"$pop"}}},{$sort:{population: -1}},{$limit:3}])

Therefore, the top 3 cities in population are: CHICAGO, BROOKLYN and LOS ANGELES.

*Query 4: What are the top 3 cities in population in Texas?*

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

Therefore, the top 3 cities are: HOUSTON, DALLAS and SAN ANTONIO.

**Bonus**

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

db.zipcodes.aggregate( [ { $group: { \_id: { state: "$state", city: "$city" }, population: { $sum: "$pop" }}}, { $group: { \_id: "$\_id.state", avgCityPop: { $avg: "$population" }}}])

*Query 2: What are the top 3 states in terms of average city population?*

db.zipcodes.aggregate( [ { $group: { \_id: { state: "$state", city: "$city" }, population: { $sum: "$pop" } } }, { $group: { \_id: "$\_id.state", avgCityPop: { $avg: "$population" } } }, { $sort: {avgCityPop: -1 } }, { $limit: 3}])

GITHUB LINK : <https://github.com/nairakhil8/Akhil-S-Nair/tree/master/MongoDB>