------- **Part 1: Queries**

Q1: Complete info about people who have 7 children

db.thePeople.find({'numChildren': 7})

Returns 16 objects

Q2: pid, state, and name of the children for people who have 7 children

db.thePeople.find({'numChildren': 7}, {'_id': 0, 'pid': 1, 'state':1, 'children': 1,})

Returns 16 objects

Q3: Complete info of people who live in CA and have 6 children

db.thePeople.find({'state': 'CA', 'numChildren': 6})

Returns 2 objects

```
> db.thePeople.find({'state': 'CA', 'numChildren': 6})
{ "_id" : ObjectId("618fd4473a832dfc77adbdb2"), "pid" : 467, "firstName" : "Priya", "MI" : "M", "lastName" : "Martinez", "state" : "CA", "age" : 24, "birth" : 1995, "salary" : 70797, "numChildren" : 6, "children" : [ "Santiago N Martinez", "Bob Y Martinez", "Sofia Y Martinez", "Linda N Martinez", "Daniella C Martinez", "William V Martinez" ], "weight" : 89, "height" : 180 }
{ "_id" : ObjectId("618fd4483a832dfc77adc0c0"), "pid" : 1249, "firstName" : "Linda", "MI" : "S", "lastName" : "Gonzalez", "state" : "CA", "age" : 26, "birth" : 1993, "salary" : 72713, "numChildren" : 6, "children" : [ "Ashley P Gonzalez", "Vivek W Gonzalez", "Vivek Y Gonzalez", "Ashley Q Gonzalez", "Ashley E Gonzalez", "John W Gonzalez" ], "weight" : 45, "height" : 167 }
>
```

Q4: Complete info of people who live in CA and have 6 or 7 children

db.thePeople.find({'state': 'CA', 'numChildren' : { '$gte' : 6, '$lte' : 7}})

Returns 3 Objects

```
> db.thePeople.find({'state': 'CA', 'numChildren' : { '$gte' :  6, '$lte' : 7}})
{ "_id" : ObjectId("618fd4473a832dfc77adbdb2"),"pid" : 467, "firstName" : "Priya", "MI" : "M", "lastName" : "Martinez", "state" : "CA", "age" : 24, "birth" : 1995, "salary" : 70797, "numChildren" : 6, "children" : [ "Santiago N Martinez", "Bob Y Martinez", "Sofia Y Martinez", "Linda N Martinez", "Daniella C Martinez", "William V Martinez" ], "weight" : 89, "height" : 180 }
{ "_id" : ObjectId("618fd4483a832dfc77adc0c0"), "pid" : 1249, "firstName" : "Linda", "MI" : "S", "lastName" : "Gonzalez", "state" : "CA", "age" : 26, "birth" : 1993, "salary" : 72713, "numChildren" : 6, "children" : [ "Ashley P Gonzalez", "Vivek W Gonzalez", "Vivek Y Gonzalez", "Ashley Q Gonzalez", "Ashley E Gonzalez", "John W Gonzalez" ], "weight" : 45, "height" : 167 }
{ "_id" : ObjectId("618fd4493a832dfc77adc296"), "pid" : 1719, "firstName" : "Jayla", "MI" : "J", "lastName" : "Liu", "state" : "CA", "age" : 116, "birth" : 1903, "salary" : 77104, "numChildren" : 7, "children" : [ "Priya Z Liu", "Sarah W Liu", "Peter U Liu", "Sofia R Liu", "William X Liu", "John D Liu", "Mary Y Liu" ], "weight" : 81, "height" : 161 }
```

Q5: List the pid and children names for all people who have a child whose name contains 'Bob A' => hint - use $regex

db.thePeople.find({'children': {'$regex': 'Bob A'}}, {'_id': 0, 'pid': 1, 'children': 1,})

Returns 5 Objects

```
> db.thePeople.find({'children': {'$regex': 'Bob A'}}, {'_id': 0, 'pid': 1, 'children': 1,})
{ "pid" : 2, "children" : [ "Vicky U Wilson", "Noah X Wilson", "Bob A Wilson" ] }
{ "pid" : 338, "children" : [ "Madison J Li", "Madison B Li", "Rahul E Li", "Neha J Li", "Bob A Li", "Hasan A Li", "Raj C Li" ] }
{ "pid" : 1040, "children" : [ "Bob A Zhao", "Tanya F Zhao", "Vicky M Zhao" ] }
{ "pid" : 1210, "children" : [ "Kayla W Jackson", "Bob A Jackson", "Rahul S Jackson", "Vivek J Jackson" ] }
{ "pid" : 1411, "children" : [ "Neha C Chan", "Bob A Chan", "Tanya K Chan", "Jayla C Chan" ] }
```

Q6: Aggregation : number of people who have 0, 1, ... 8 children

db.thePeople.aggregate([{$group: {_id: '$numChildren', numInGroup: {$sum:1}}},{$sort: {"_id":1}}])

Returns 9 Objects

```
> db.thePeople.aggregate([{$group: {_id: '$numChildren', numInGroup: {$sum:1}}},{$sort: {"_id":1}}])
{ "_id" : 0, "numInGroup" : 67 }
{ "_id" : 1, "numInGroup" : 173 }
{ "_id" : 2, "numInGroup" : 408 }
{ "_id" : 3, "numInGroup" : 569 }
{ "_id" : 4, "numInGroup" : 437 }
{ "_id" : 5, "numInGroup" : 250 }
{ "_id" : 6, "numInGroup" : 78 }
{ "_id" : 7, "numInGroup" : 16 }
{ "_id" : 8, "numInGroup" : 2 }
>
```

Q7: Aggregation: average salary for each state:

db.thePeople.aggregate([{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, numInGroup: {$sum:1}}},{$sort: {"_id":1}}])

Returns 49 Objects

```
> db.thePeople.aggregate([{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, numInGroup: {$sum:1}}},{$sort: {"_id":1}}])
{ "_id" : "AK", "averageSalary" : 86931.97619047618, "numInGroup" : 42 }
{ "_id" : "AL", "averageSalary" : 76397.41304347826, "numInGroup" : 46 }
{ "_id" : "AZ", "averageSalary" : 80633.58666666667, "numInGroup" : 75 }
{ "_id" : "CA", "averageSalary" : 77116.1282051282, "numInGroup" : 39 }
{ "_id" : "CO", "averageSalary" : 83968.02222222222, "numInGroup" : 45 }
{ "_id" : "CT", "averageSalary" : 86389.48148148147, "numInGroup" : 27 }
{ "_id" : "DE", "averageSalary" : 81791.9, "numInGroup" : 40 }
{ "_id" : "FL", "averageSalary" : 85303.60869565218, "numInGroup" : 46 }
{ "_id" : "GA", "averageSalary" : 85883.92307692308, "numInGroup" : 39 }
{ "_id" : "HI", "averageSalary" : 75374.06976744186, "numInGroup" : 43 }
{ "_id" : "IA", "averageSalary" : 84773.19230769231, "numInGroup" : 26 }
{ "_id" : "ID", "averageSalary" : 81497.725, "numInGroup" : 40 }
{ "_id" : "IL", "averageSalary" : 80329.17948717948, "numInGroup" : 39 }
{ "_id" : "IN", "averageSalary" : 80722.02564102564, "numInGroup" : 39 }
{ "_id" : "KS", "averageSalary" : 82822.25, "numInGroup" : 36 }
{ "_id" : "KY", "averageSalary" : 75237.83333333333, "numInGroup" : 36 }
{ "_id" : "LA", "averageSalary" : 78642.43589743589, "numInGroup" : 39 }
{ "_id" : "MA", "averageSalary" : 76031.4255319149, "numInGroup" : 47 }
{ "_id" : "MD", "averageSalary" : 82684.55555555556, "numInGroup" : 45 }
{ "_id" : "ME", "averageSalary" : 64820.44827586207, "numInGroup" : 29 }
Type "it" for more
> it
{ "_id" : "MI", "averageSalary" : 77196.51351351352, "numInGroup" : 37 }
{ "_id" : "MN", "averageSalary" : 79788.08333333333, "numInGroup" : 36 }
{ "_id" : "MO", "averageSalary" : 71023.06976744186, "numInGroup" : 43 }
{ "_id" : "MS", "averageSalary" : 76276.27272727272, "numInGroup" : 44 }
{ "_id" : "MT", "averageSalary" : 77147.83333333333, "numInGroup" : 42 }
{ "_id" : "NC", "averageSalary" : 74043.69444444444, "numInGroup" : 36 }
{ "_id" : "ND", "averageSalary" : 92167.31818181818, "numInGroup" : 44 }
{ "_id" : "NE", "averageSalary" : 72756.17391304347, "numInGroup" : 46 }
{ "_id" : "NH", "averageSalary" : 78727.33333333333, "numInGroup" : 36 }
{ "_id" : "NJ", "averageSalary" : 91666.93103448275, "numInGroup" : 29 }
{ "_id" : "NM", "averageSalary" : 84028.53488372093, "numInGroup" : 43 }
{ "_id" : "NV", "averageSalary" : 80805.23809523809, "numInGroup" : 42 }
{ "_id" : "NY", "averageSalary" : 83155.72222222222, "numInGroup" : 54 }
{ "_id" : "OH", "averageSalary" : 81560.09302325582, "numInGroup" : 43 }
{ "_id" : "OK", "averageSalary" : 82044.42424242424, "numInGroup" : 33 }
{ "_id" : "OR", "averageSalary" : 76614.54545454546, "numInGroup" : 44 }
{ "_id" : "PA", "averageSalary" : 75458.61538461539, "numInGroup" : 39 }
{ "_id" : "RI", "averageSalary" : 81733.62068965517, "numInGroup" : 29 }
{ "_id" : "SC", "averageSalary" : 81701.57777777778, "numInGroup" : 45 }
{ "_id" : "SD", "averageSalary" : 81560.26, "numInGroup" : 50 }
Type "it" for more
> it
```

```
{ "_id" : "TN", "averageSalary" : 90134, "numInGroup" : 29 }
{ "_id" : "TX", "averageSalary" : 78097.27272727272, "numInGroup" : 44 }
{ "_id" : "UT", "averageSalary" : 82353.93023255814, "numInGroup" : 43 }
{ "_id" : "VA", "averageSalary" : 80331, "numInGroup" : 39 }
{ "_id" : "VT", "averageSalary" : 69773.73469387754, "numInGroup" : 49 }
{ "_id" : "WA", "averageSalary" : 79021.79591836735, "numInGroup" : 49 }
{ "_id" : "WI", "averageSalary" : 81550.875, "numInGroup" : 24 }
{ "_id" : "WV", "averageSalary" : 71989.26190476191, "numInGroup" : 42 }
{ "_id" : "WY", "averageSalary" : 80849.47916666667, "numInGroup" : 48 }
>
```

Q8: Aggregation: average salary and how many people in the grouping for those living in WI state:

db.thePeople.aggregate([{$match: {state: 'WI'}},{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, numInGroup: {$sum:1}}}])

Returns 1 Objects

```
> db.thePeople.aggregate([{$match: {state: 'WI'}},{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, numInGroup: {$sum:1}}}])
{ "_id" : "WI", "averageSalary" : 81550.875, "numInGroup" : 24 }
```

Q9: Aggregation: average/min/max salary for midwest state:

db.thePeople.aggregate([{$match: {$or:[{state: 'IA'}, {state: 'IL'},{state: 'ND'}, {state: 'SD'}, {state:
'MI'},{state: 'NE'}, {state: 'KS'}, {state: 'MO'}, {state: 'MN'}, {state: 'OH'},{state: 'WI'}, {state: 'IN'}
]}},{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, minSalary :{$min:"$salary"}, maxSalary
:{$max:"$salary"}, numInGroup: {$sum:1}}}, {$sort: {"_id":1}}])

Returns 12 Objects

```
> db.thePeople.aggregate([{$match: {$or:[{state: 'IA'}, {state: 'IL'},{state: 'ND'}, {state: 'SD'}, {state: 'MI'},{state: 'NE'}, {state: 'KS'}, {state: 'MO'}, {state: 'MN'}, {state: 'OH'},{state: 'WI'}, {state:
'IN'} ]}},{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, minSalary :{$min:"$salary"}, maxSalary :{$max:"$salary"}, numInGroup: {$sum:1}}}, {$sort: {"_id":1}}])
{ "_id" : "IA", "averageSalary" : 84773.19230769231, "minSalary" : 32278, "maxSalary" : 129977, "numInGroup" : 26 }
{ "_id" : "IL", "averageSalary" : 80329.17948717948, "minSalary" : 32045, "maxSalary" : 127126, "numInGroup" : 39 }
{ "_id" : "IN", "averageSalary" : 80722.02564102564, "minSalary" : 32116, "maxSalary" : 128675, "numInGroup" : 39 }
{ "_id" : "KS", "averageSalary" : 82822.25, "minSalary" : 30954, "maxSalary" : 129962, "numInGroup" : 36 }
{ "_id" : "MI", "averageSalary" : 77196.51351351352, "minSalary" : 35749, "maxSalary" : 128868, "numInGroup" : 37 }
{ "_id" : "MN", "averageSalary" : 79788.08333333333, "minSalary" : 31425, "maxSalary" : 125317, "numInGroup" : 36 }
{ "_id" : "MO", "averageSalary" : 71023.06976744186, "minSalary" : 30695, "maxSalary" : 128765, "numInGroup" : 43 }
{ "_id" : "ND", "averageSalary" : 92167.31818181818, "minSalary" : 38172, "maxSalary" : 129437, "numInGroup" : 44 }
{ "_id" : "NE", "averageSalary" : 72756.17391304347, "minSalary" : 30179, "maxSalary" : 129283, "numInGroup" : 46 }
{ "_id" : "OH", "averageSalary" : 81560.09302325582, "minSalary" : 31223, "maxSalary" : 129487, "numInGroup" : 43 }
{ "_id" : "SD", "averageSalary" : 81560.26, "minSalary" : 34495, "maxSalary" : 129228, "numInGroup" : 50 }
{ "_id" : "WI", "averageSalary" : 81550.875, "minSalary" : 34027, "maxSalary" : 124138, "numInGroup" : 24 }
```

Q10: Aggregation: average salary in states where the average salary within that state is >= 82,000 and how many people in the grouping for each state:

db.thePeople.aggregate([{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, numInGroup:
{$sum:1}}}, {$match: {averageSalary: {'$gte': 82000}}}, {$sort: {"_id":1}}])

Returns 15 Objects

```
> db.thePeople.aggregate([{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, numInGroup: {$sum:1}}}, {$match: {averageSalary: {'$gte': 82000}}}, {$sort: {"_id":1}}])
{ "_id" : "AK", "averageSalary" : 86931.97619047618, "numInGroup" : 42 }
{ "_id" : "CO", "averageSalary" : 83968.02222222222, "numInGroup" : 45 }
{ "_id" : "CT", "averageSalary" : 86389.48148148147, "numInGroup" : 27 }
{ "_id" : "FL", "averageSalary" : 85303.60869565218, "numInGroup" : 46 }
{ "_id" : "GA", "averageSalary" : 85883.92307692308, "numInGroup" : 39 }
{ "_id" : "IA", "averageSalary" : 84773.19230769231, "numInGroup" : 26 }
{ "_id" : "KS", "averageSalary" : 82822.25, "numInGroup" : 36 }
{ "_id" : "MD", "averageSalary" : 82684.55555555556, "numInGroup" : 45 }
{ "_id" : "ND", "averageSalary" : 92167.31818181818, "numInGroup" : 44 }
{ "_id" : "NJ", "averageSalary" : 91666.93103448275, "numInGroup" : 29 }
{ "_id" : "NM", "averageSalary" : 84028.53488372093, "numInGroup" : 43 }
{ "_id" : "NY", "averageSalary" : 83155.72222222222, "numInGroup" : 54 }
{ "_id" : "OK", "averageSalary" : 82044.42424242424, "numInGroup" : 33 }
{ "_id" : "TN", "averageSalary" : 90134, "numInGroup" : 29 }
{ "_id" : "UT", "averageSalary" : 82353.93023255814, "numInGroup" : 43 }
```

Q11: Aggregation: average/min/max salary for midwest state whose average salary > 82000:

db.thePeople.aggregate([{$match: {$or:[{state: 'IA'}, {state: 'IL'},{state: 'ND'}, {state: 'SD'}, {state:
'MI'},{state: 'NE'}, {state: 'KS'}, {state: 'MO'}, {state: 'MN'}, {state: 'OH'},{state: 'WI'}, {state: 'IN'}
]}},{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, minSalary :{$min:"$salary"}, maxSalary
:{$max:"$salary"}, numInGroup: {$sum:1}}}, {$match: {averageSalary: {'$gte': 82000}}}, {$sort:
{"_id":1}}])

```
> db.thePeople.aggregate([{$match: {$or:[{state: 'IA'}, {state: 'IL'},{state: 'ND'}, {state: 'SD'}, {state: 'MI'},{state: 'NE'}, {state: 'KS'}, {state: 'MO'}, {state: 'MN'}, {state: 'OH'},{state: 'WI'}, {state:
'IN'} ]}},{$group: {_id: '$state',averageSalary :{$avg:"$salary"}, minSalary :{$min:"$salary"}, maxSalary :{$max:"$salary"}, numInGroup: {$sum:1}}}, {$match: {averageSalary: {'$gte': 82000}}}, {$sort: {"_id":1}}
])
{ "_id" : "IA", "averageSalary" : 84773.19230769231, "minSalary" : 32278, "maxSalary" : 129977, "numInGroup" : 26 }
{ "_id" : "KS", "averageSalary" : 82822.25, "minSalary" : 30954, "maxSalary" : 129962, "numInGroup" : 36 }
{ "_id" : "ND", "averageSalary" : 92167.31818181818, "minSalary" : 38172, "maxSalary" : 129437, "numInGroup" : 44 }
```

------- Part 2: Updates/Deletes

Write an example of an update for the collection you used in Part 1 that changes one document. Print the document before and after.

```
> db.thePeople.updateOne({'pid': 2}, {'$set': {'salary': 50000}})
{ "acknowledged" : true, "matchedCount" : 1, "modifiedCount" : 1 }
>
```

```
> db.thePeople.find({'pid': 2})
{ "_id" : ObjectId("618fd4473a832dfc77adbbe1"), "pid" : 2, "firstName" : "Fatimah", "MI" : "B", "lastName" : "Wilson", "state" : "WY", "age" : 66, "birth" : 1953, "salary" : 45198, "numChildren" : 3, "children"
: [ "Vicky U Wilson", "Noah X Wilson", "Bob A Wilson" ], "weight" : 77, "height" : 170 }
```

```
> db.thePeople.find({'pid': 2})
{ "_id" : ObjectId("618fd4473a832dfc77adbbe1"), "pid" : 2, "firstName" : "Fatimah", "MI" : "B", "lastName" : "Wilson", "
state" : "WY", "age" : 66, "birth" : 1953, "salary" : 50000, "numChildren" : 3, "children" : [ "Vicky U Wilson", "Noah X
 Wilson", "Bob A Wilson" ], "weight" : 77, "height" : 170 }
```

Write an example of an update for the collection you used in Part 1 that changes multiple documents. Print the documents before and after.

```
> db.thePeople.updateMany({'children': {'$regex': 'Bob A'}}, {'$set': {'state': 'AK'}})
{ "acknowledged" : true, "matchedCount" : 5, "modifiedCount" : 5 }
>
```

```
> db.thePeople.find({'children': {'$regex': 'Bob A'}}, {'_id': 0, 'pid': 1, 'state': 1, 'children': 1,})
{ "pid" : 2, "state" : "WY", "children" : [ "Vicky U Wilson", "Noah X Wilson", "Bob A Wilson" ] }
{ "pid" : 338, "state" : "GA", "children" : [ "Madison J Li", "Madison B Li", "Rahul E Li", "Neha J Li", "Bob A Li", "Hasan A Li", "Raj C Li" ] }
{ "pid" : 1040, "state" : "TX", "children" : [ "Bob A Zhao", "Tanya F Zhao", "Vicky M Zhao" ] }
{ "pid" : 1210, "state" : "MT", "children" : [ "Kayla W Jackson", "Bob A Jackson", "Rahul S Jackson", "Vivek J Jackson" ] }
{ "pid" : 1411, "state" : "IN", "children" : [ "Neha C Chan", "Bob A Chan", "Tanya K Chan", "Jayla C Chan" ] }
>
```

After Update:

```
> db.thePeople.find({'children': {'$regex': 'Bob A'}}, {'_id': 0, 'pid': 1, 'state': 1, 'children': 1,})
{ "pid" : 2, "state" : "AK", "children" : [ "Vicky U Wilson", "Noah X Wilson", "Bob A Wilson" ] }
{ "pid" : 338, "state" : "AK", "children" : [ "Madison J Li", "Madison B Li", "Rahul E Li", "Neha J Li", "Bob A Li", "Hasan A Li", "Raj C Li" ] }
{ "pid" : 1040, "state" : "AK", "children" : [ "Bob A Zhao", "Tanya F Zhao", "Vicky M Zhao" ] }
{ "pid" : 1210, "state" : "AK", "children" : [ "Kayla W Jackson", "Bob A Jackson", "Rahul S Jackson", "Vivek J Jackson" ] }
{ "pid" : 1411, "state" : "AK", "children" : [ "Neha C Chan", "Bob A Chan", "Tanya K Chan", "Jayla C Chan" ] }
```

Write an example of a delete command for the collection you used in Part 1 that deletes more than one document. Print a subset of the documents before and after that shows the delete worked.

Update: Delete all people without children

```
> db.thePeople.deleteMany({'numChildren': 0})
{ "acknowledged" : true, "deletedCount" : 67 }
>
```

Before Update:

```
> db.thePeople.aggregate([{$group: {_id: '$numChildren', numInGroup: {$sum:1}}},{$sort: {"_id":1}}])
{ "_id" : 0, "numInGroup" : 67 }
{ "_id" : 1, "numInGroup" : 173 }
{ "_id" : 2, "numInGroup" : 408 }
{ "_id" : 3, "numInGroup" : 569 }
{ "_id" : 4, "numInGroup" : 437 }
{ "_id" : 5, "numInGroup" : 250 }
{ "_id" : 6, "numInGroup" : 78 }
{ "_id" : 7, "numInGroup" : 16 }
{ "_id" : 8, "numInGroup" : 2 }
>
```

After Update:

```
> db.thePeople.aggregate([{$group: {_id: '$numChildren', numInGroup: {$sum:1}}},{$sort: {"_id":1}}])
{ "_id" : 1, "numInGroup" : 173 }
{ "_id" : 2, "numInGroup" : 408 }
{ "_id" : 3, "numInGroup" : 569 }
{ "_id" : 4, "numInGroup" : 437 }
{ "_id" : 5, "numInGroup" : 250 }
{ "_id" : 6, "numInGroup" : 78 }
{ "_id" : 7, "numInGroup" : 16 }
{ "_id" : 8, "numInGroup" : 2 }
```