ADSD HW9 Aggregation

In this homework I will mongodb as main test databset.

I use `mongodb://<dbuser>:<dbpassword>@ds027415.mongolab.com:27415/todoshuchang`

Mongo command line to test aggregation.

```
db.zipcodes.aggregate( [

  { $group: { _id: { state: "$state", city: "$city" }, pop: { $sum: "$pop" } } },

  { $group: { _id: "$_id.state", avgCityPop: { $avg: "$pop" } } }

] )
```

```
rs-ds027415:PRIMARY> db.exampels.aggregate([
... { $group: { _id: "$state", totalPop: { $sum: "$pop" } } }, { $match: { totalPop: { $gt
e: 10*1000*1000 } } }
... ])
{ "_id" : "CA", "totalPop" : 29754890 }
{ "_id" : "TX", "totalPop" : 16984601 }
{ "_id" : "FL", "totalPop" : 12686644 }
{ "_id" : "PA", "totalPop" : 11881643 }
{ "_id" : "OH", "totalPop" : 10846517 }
{ "_id" : "IL", "totalPop" : 11427576 }
{ "_id" : "NY", "totalPop" : 17990402 }
rs-ds027415:PRIMARY>
```

Example2:

```
db.zipcodes.aggregate( [
  { $group:
    {
      _id: { state: "$state", city: "$city" },
      pop: { $sum: "$pop" }
    }
  },
  { $sort: { pop: 1 } },
  { $group:
    {
      _id : "$_id.state",
      biggestCity:  { $last: "$_id.city" },
      biggestPop:   { $last: "$pop" },
      smallestCity: { $first: "$_id.city" },
      smallestPop:  { $first: "$pop" }
    }
  }
] )
```

```
rs-ds027415:PRIMARY>  db.exampels.aggregate( [
...     { $group:
...         {
...             _id: { state: "$city" , city: "$state"},
...             pop: { $sum: "$pop" }
...         }
...     },
...     { $sort: {pop:1}} ,
...     { $group:
...         {
...             _id: "$_id.state",
...             biggestCity: {$last: "$_id.city"},
...             biggestPop: { $last: "$pop" },
...             smallestCity: { $first: "$_id.city" },
...             smalestPop: {$first: "$pop"}
...         }
...     }
... ])
{ "_id" : "CHICAGO", "biggestCity" : "IL", "biggestPop" : 2452177, "smallestCity" : "IL", "smalestPop" : 2452177 }
{ "_id" : "NEW YORK", "biggestCity" : "NY", "biggestPop" : 1476790, "smallestCity" : "NY", "smalestPop" : 1476790 }
{ "_id" : "SAN FRANCISCO", "biggestCity" : "CA", "biggestPop" : 723993, "smallestCity" : "CA", "smalestPop" : 723993 }
{ "_id" : "MILWAUKEE", "biggestCity" : "WI", "biggestPop" : 597324, "smallestCity" : "WI", "smalestPop" : 597324 }
{ "_id" : "SEATTLE", "biggestCity" : "WA", "biggestPop" : 520096, "smallestCity" : "WA", "smalestPop" : 520096 }
{ "_id" : "NEW ORLEANS", "biggestCity" : "LA", "biggestPop" : 496937, "smallestCity" : "LA", "smalestPop" : 496937 }
{ "_id" : "FORT WORTH", "biggestCity" : "TX", "biggestPop" : 451415, "smallestCity" : "TX", "smalestPop" : 451415 }
{ "_id" : "HONOLULU", "biggestCity" : "HI", "biggestPop" : 396643, "smallestCity" : "HI", "smalestPop" : 396643 }
{ "_id" : "OKLAHOMA CITY", "biggestCity" : "OK", "biggestPop" : 368141, "smallestCity" : "OK", "smalestPop" : 368141 }
{ "_id" : "COLORADO SPRINGS", "biggestCity" : "CO", "biggestPop" : 340404, "smallestCity" : "CO", "smalestPop" : 340404 }
{ "_id" : "BATON ROUGE", "biggestCity" : "LA", "biggestPop" : 291688, "smallestCity" : "LA", "smalestPop" : 291688 }
{ "_id" : "SAINT PETERSBURG", "biggestCity" : "FL", "biggestPop" : 290866, "smallestCity" : "FL", "smalestPop" : 290866 }
{ "_id" : "FORT WAYNE", "biggestCity" : "IN", "biggestPop" : 261863, "smallestCity" : "IN", "smalestPop" : 261863 }
{ "_id" : "SANTA ANA", "biggestCity" : "CA", "biggestPop" : 234472, "smallestCity" : "CA", "smalestPop" : 234472 }
{ "_id" : "JERSEY CITY", "biggestCity" : "NJ", "biggestPop" : 228537, "smallestCity" : "NJ", "smalestPop" : 228537 }
{ "_id" : "LUBBOCK", "biggestCity" : "TX", "biggestPop" : 201288, "smallestCity" : "TX", "smalestPop" : 201288 }
{ "_id" : "WINSTON SALEM", "biggestCity" : "NC", "biggestPop" : 196581, "smallestCity" : "NC", "smalestPop" : 196581 }
{ "_id" : "TACOMA", "biggestCity" : "WA", "biggestPop" : 194282, "smallestCity" : "WA", "smalestPop" : 194282 }
{ "_id" : "CRANSTON", "biggestCity" : "RI", "biggestPop" : 176404, "smallestCity" : "RI", "smalestPop" : 176404 }
{ "_id" : "SCOTTSDALE", "biggestCity" : "AZ", "biggestPop" : 169083, "smallestCity" : "AZ", "smalestPop" : 169083 }
Type "it" for more
rs-ds027415:PRIMARY>
```