

CS-340 Client/Server Development

1. Creating the database:

```

(base) kennedy.uzoho_snhu@msnv-snhu3-1001: /usr/local/datasets$ ls
aac.csv              city_inspections.json  companies1.json        companiesFail.json     enron.json            new.csv
snhu_companies.json  aac_shelter_outcomes.csv  companies0.json        companies2.json        companies.json         'Grazioso Salvare Logo.png'  ProjectTwoDashboard.ipynb
(base) kennedy.uzoho_snhu@msnv-snhu3-1001: /usr/local/datasets$ mongod --port 54632 --db companies --collection research -- /companies.json
+++ Starting MongoDB (NOAUTH): Port=54632 Unix Socket=/tmp/mongod-54632.sock Dir=/home/kennedy.uzoho_snhu/mongod
(base) kennedy.uzoho_snhu@msnv-snhu3-1001: /usr/local/datasets$ mongoimport --port 54632 --db companies --collection research -- /companies.json
connected to: mongod://localhost:54632/
18801 document(s) imported successfully. 0 document(s) failed to import.

```

```

File Edit View Search Terminal Help

> show dbs
AAC          0.003GB
admin        0.000GB
city         0.010GB
companies    0.031GB
config       0.000GB
enron        0.007GB
local        0.000GB
test         0.000GB

> use companies
switched to db companies

> show collections
research

> db.research.find({"name" : "AdventNet"})
{ "_id" : ObjectId("52cdefc74bab8bd675297d8b"), "name" : "AdventNet", "permalink" : "abc3", "crunchbase_url" : "http://www.crunchbase.com/company/adventnet", "homepage_url" : "http://adventnet.com", "blog_url" : "", "blog_feed_url" : "", "twitter_username" : "manageengine", "category_code" : "enterprise", "number_of_employees" : 600, "founded_year" : 1996, "deadpooled_year" : 2, "tag_list" : "", "alias_list" : "Zoho ManageEngine", "email_address" : "pr@adventnet.com", "phone_number" : "925-924-9500", "description" : "Server Management Software", "created_at" : ISODate("2007-05-25T19:24:22Z"), "updated_at" : "Wed Oct 31 18:26:09 UTC 2012", "overview" : "<p>AdventNet is now <a href='\"/company/zoho-manageengine/\"' title='\"Zoho ManageEngine\"' rel='\"nofollow\"'>Zoho ManageEngine</a>.</p>\n\n<p>Founded in 1996, AdventNet has served a diverse range of enterprise IT, networking and telecom customers.</p>\n\n<p>AdventNet supplies server and network management software.</p>", "image" : { "available_sizes" : [ [ 150, 55 ], "assets/images/resized/0001/9732/19732v1-max-150x150.png" ], [ 150, 55 ], "assets/images/resized/0001/9732/19732v1-max-250x250.png" ], [ 150, 55 ], "assets/images/resized/0001/9732/19732v1-max-450x450.png" ] }, "products" : [ ], "relationships" : [ { "is_past" : true, "title" : "CEO and Co-Founder", "person" : { "first_name" : "Sridhar", "last_name" : "Vembu", "permalink" : "sridhar-vembu" } }, { "is_past" : true, "title" : "VP of Business Development", "person" : { "first_name" : "Neil", "last_name" : "Butani", "permalink" : "neil-butani" } }, { "is_past" : true, "title" : "Usability Engineer", "person" : { "first_name" : "Bharath", "last_name" : "Balasubramanian", "permalink" : "bharath-balasubramanian" } }, { "is_past" : true, "title" : "Director of Engineering", "person" : { "first_name" : "Rajendran", "last_name" : "Dandapani", "permalink" : "rajendran-dandapani" } }, { "is_past" : true, "title" : "Market Analyst", "person" : { "first_name" : "Aravind", "last_name" : "Natarajan", "permalink" : "aravind-natarajan" } }, { "is_past" : true, "title" : "Director of Product Management", "person" : { "first_name" : "Hyther", "last_name" : "Nizam", "permalink" : "hyther-nizam" } }, { "is_past" : true, "title" : "Western Regional OEM Sales Manager", "person" : { "first_name" : "Ian", "last_name" : "Wenig", "permalink" : "ian-wenig" } }, "competitions" : [ ], "providerships" : [ { "title" : "DHFH", "is_past" : true, "provider" : { "name" : "A Small Orange", "permalink" : "a-small-orange" } }, "total_money_raised" : "$0", "funding_rounds" : [ ], "investments" : [ ], "acquisition" : null, "acquisitions" : [ ], "offices" : [ { "description" : "Headquarters", "address1" : "4900 Hopyard Rd.", "address2" : "Suite 310", "zip_code" : "94588", "city" : "Pleasanton", "state_code" : "CA", "country_code" : "USA", "latitude" : 37.692934, "longitude" : -121.994945 }, "milestones" : [ ], "video_embeds" : [ ], "screenshots" : [ { "available_sizes" : [ [ 150, 94 ], "assets/images/resized/0004/3400/43400v1-max-150x150.png" ], [ 250, 156 ], "assets/images/resized/0004/3400/43400v1-max-250x250.png" ], [ 450, 282 ], "assets/images/resized/0004/3400/43400v1-max-450x450.png" ], "attribution" : null }, "external_links" : [ ], "partners" : [ ] }
>

```

```
kennedy.uzoho_snhu@msnv-snhu3-l001: /usr/local/datasets
File Edit View Search Terminal Help

> db.research.find({"founded_year": 1996},{ "name": 1}).limit(10)
{ "_id" : ObjectId("52cdef7c4bab8bd675297d8b"), "name" : "AdventNet" }
{ "_id" : ObjectId("52cdef7c4bab8bd675297e24"), "name" : "RegOnline" }
{ "_id" : ObjectId("52cdef7c4bab8bd675297e42"), "name" : "LiveWorld" }
{ "_id" : ObjectId("52cdef7c4bab8bd675297f26"), "name" : "Shopzilla" }
{ "_id" : ObjectId("52cdef7c4bab8bd675297fca"), "name" : "LinkShare" }
{ "_id" : ObjectId("52cdef7c4bab8bd675298032"), "name" : "MSNBC" }
{ "_id" : ObjectId("52cdef7c4bab8bd6752980cf"), "name" : "TheStreet" }
{ "_id" : ObjectId("52cdef7c4bab8bd6752980d0"), "name" : "Omniture" }
{ "_id" : ObjectId("52cdef7c4bab8bd6752980df"), "name" : "Blucora" }
{ "_id" : ObjectId("52cdef7c4bab8bd675298223"), "name" : "Alexa" }
```

2. Using MongoDB queries:

- a. List only the first 20 names of companies founded after the year 2010, ordered alphabetically.

```
db.research.find({"founded_year":{"$gt":2010}},{"name":1}).sort({"name":1}).limit(20)
```

```
kennedy.uzoho_snhu@msnv-snhu3-1001: /usr/local/datasets
File Edit View Search Terminal Help
> show collections
research
> db.research.find({"founded_year":{"$gt":2010}},{"name":1}).sort({"name":1}).limit(20)
{"_id": "ObjectId('52cdef7e4bab8bd67529b2f3")", "name": "4shared" }
{"_id": "ObjectId('52cdef7c4bab8bd6752982d4")", "name": "Advaliant" }
{"_id": "ObjectId('52cdef7d4bab8bd675299308")", "name": "Advisor" }
{"_id": "ObjectId('52cdef7d4bab8bd67529a048")", "name": "Baveo" }
{"_id": "ObjectId('52cdef7d4bab8bd6752992f7")", "name": "Bling Easy" }
{"_id": "ObjectId('52cdef7d4bab8bd675298da5")", "name": "Carfeine" }
{"_id": "ObjectId('52cdef7c4bab8bd675297f78")", "name": "CircleUp" }
{"_id": "ObjectId('52cdef7e4bab8bd67529a3b8")", "name": "Cloudy" }
{"_id": "ObjectId('52cdef7e4bab8bd67529b30f")", "name": "CompareChecker" }
{"_id": "ObjectId('52cdef7e4bab8bd67529a38a")", "name": "Cyphercor" }
{"_id": "ObjectId('52cdef7f4bab8bd67529c6eb")", "name": "DocASAP" }
{"_id": "ObjectId('52cdef7e4bab8bd67529bb4d")", "name": "Easel" }
{"_id": "ObjectId('52cdef7d4bab8bd67529915f")", "name": "EasyBib" }
{"_id": "ObjectId('52cdef7d4bab8bd67529a0b4")", "name": "Emotive Communications" }
{"_id": "ObjectId('52cdef7e4bab8bd67529ae2a")", "name": "FAT Media" }
{"_id": "ObjectId('52cdef7d4bab8bd675299f92")", "name": "FamilyDen" }
{"_id": "ObjectId('52cdef7d4bab8bd6752989f3")", "name": "FirstString" }
{"_id": "ObjectId('52cdef7c4bab8bd675297fec")", "name": "Fixya" }
{"_id": "ObjectId('52cdef7e4bab8bd67529b1ef")", "name": "Fliggo" }
{"_id": "ObjectId('52cdef7c4bab8bd67529830a")", "name": "Fluc" }
```

- b. List only the first 20 names of companies with offices in either California or Texas, ordered by the number of employees and sorted from largest to smallest.

```
db.research.find({$or:[{"offices.state_code":"CA"}, {"offices.state_code":"TX"}]}, {"name":1}).sort({"number_of_employees":-1}).limit(20)
```

```
kennedy.uzoho_snhu@msnv-snhu3-1001: /usr/local/datasets
File Edit View Search Terminal Help
> show collections
research
> db.research.find({$or:[{"offices.state_code":"CA"}, {"offices.state_code":"TX"}]}, {"name":1}).sort({"number_of_employees":-1}).limit(20)
{"_id": "ObjectId('52cdef7c4bab8bd675297e89")", "name": "PayPal" }
{"_id": "ObjectId('52cdef7d4bab8bd675298aa4")", "name": "Samsung Electronics" }
{"_id": "ObjectId('52cdef7d4bab8bd675298b99")", "name": "Accenture" }
{"_id": "ObjectId('52cdef7e4bab8bd67529aa51")", "name": "Flextronics International" }
{"_id": "ObjectId('52cdef7d4bab8bd675299156")", "name": "Safeway" }
{"_id": "ObjectId('52cdef7c4bab8bd675297e6f")", "name": "Sony" }
{"_id": "ObjectId('52cdef7c4bab8bd675297dc4")", "name": "Intel" }
{"_id": "ObjectId('52cdef7c4bab8bd675298189")", "name": "Apple" }
{"_id": "ObjectId('52cdef7c4bab8bd6752983b9")", "name": "Dell" }
{"_id": "ObjectId('52cdef7e4bab8bd67529b998")", "name": "ExxonMobil" }
{"_id": "ObjectId('52cdef7f4bab8bd67529c29e")", "name": "Affiliated Computer Services" }
{"_id": "ObjectId('52cdef7c4bab8bd675297da2")", "name": "Cisco" }
{"_id": "ObjectId('52cdef7c4bab8bd675297ee9")", "name": "Sun Microsystems" }
{"_id": "ObjectId('52cdef7c4bab8bd6752987ff")", "name": "Texas Instruments" }
{"_id": "ObjectId('52cdef7c4bab8bd675297dba")", "name": "Google" }
{"_id": "ObjectId('52cdef7c4bab8bd675297e8e")", "name": "The Walt Disney Company" }
{"_id": "ObjectId('52cdef7d4bab8bd675298cb5")", "name": "Avaya" }
{"_id": "ObjectId('52cdef7d4bab8bd67529912e")", "name": "AMD" }
{"_id": "ObjectId('52cdef7c4bab8bd6752982a8")", "name": "Experian" }
{"_id": "ObjectId('52cdef7c4bab8bd675297d9b")", "name": "eBay" }
```

3. Design and implement a MongoDB aggregation pipeline:

Design and implement a MongoDB aggregation pipeline to show the total number of employees by the state for all companies that have offices in the United States. Be sure that you account for the fact that some companies have offices in several states.

```
db.research.aggregate([{$match:{"offices.country_code":"USA"}},{$group:{_id:"$offices.state_code",sumQuantity:{$sum: "$number_of_employees"}}}])
```

```
kennedy.uzoho_snhu@msnv-snhu3-1001: /usr/local/datasets
File Edit View Search Terminal Help
> show collections
research
> db.research.aggregate([{$match:{'offices.country_code':"USA"}},{$group:{'_id':'$offices.state_code',sumQuantity:{$sum: "$number_of_employees"}}}])
{ "_id" : [ "MA", null ], "sumQuantity" : 61 }
{ "_id" : [ "AR", null ], "sumQuantity" : 12412 }
{ "_id" : [ "MA", "NV", null ], "sumQuantity" : 0 }
{ "_id" : [ "MD", "OR", null ], "sumQuantity" : 10 }
{ "_id" : [ "NJ", "NY", "PA", null ], "sumQuantity" : 0 }
{ "_id" : [ "CA", "NY", "IL", null ], "sumQuantity" : 0 }
{ "_id" : [ "CA", "NY", "PA", "VA", "CA", "TX", null ], "sumQuantity" : 10 }
{ "_id" : [ null, "ME", null ], "sumQuantity" : 25 }
{ "_id" : [ "CT", "IL", null ], "sumQuantity" : 0 }
{ "_id" : [ "IL", "NY", null ], "sumQuantity" : 500 }
{ "_id" : [ null, "NY", null, null, null ], "sumQuantity" : 300 }
{ "_id" : [ null, null, null, null, null, "NY", null ], "sumQuantity" : 60 }
{ "_id" : [ null, null, "NV", null ], "sumQuantity" : 75 }
{ "_id" : [ "KS", null ], "sumQuantity" : 337 }
{ "_id" : [ "CA", "MA", "CO", null ], "sumQuantity" : 0 }
{ "_id" : [ "GA", null ], "sumQuantity" : 90 }
{ "_id" : [ "CA", "WI", null ], "sumQuantity" : 0 }
{ "_id" : [ "CO", "WY", null ], "sumQuantity" : 72 }
{ "_id" : [ null, "CA", "NY", null, null, null, null, null ], "sumQuantity" : 150 }
{ "_id" : [ "MA", "CA", null, null ], "sumQuantity" : 100 }
Type "it" for more
> it
{ "_id" : [ "FL", "GA", null ], "sumQuantity" : 165 }
{ "_id" : [ "NY", "PA", null ], "sumQuantity" : 0 }
{ "_id" : [ "CA", null, "NY", null ], "sumQuantity" : 55 }
{ "_id" : [ "NY", "MA", null ], "sumQuantity" : 131 }
{ "_id" : [ "NC", "NC", null ], "sumQuantity" : 110 }
{ "_id" : [ "UT", "CA", "NY", null ], "sumQuantity" : 0 }
{ "_id" : [ null, null, "CA", null ], "sumQuantity" : 661 }
{ "_id" : [ "NJ", "PA", null ], "sumQuantity" : 6 }
{ "_id" : [ "NH", null, null ], "sumQuantity" : 8 }
{ "_id" : [ "MD", "DC", null ], "sumQuantity" : 38 }
{ "_id" : [ "CA", "NY", "IL", "AZ", "CA", null ], "sumQuantity" : 148 }
{ "_id" : [ null, null, "VA", null ], "sumQuantity" : 4 }
{ "_id" : [ "NY", null ], "sumQuantity" : 915 }
{ "_id" : [ null, "CA", null, null, null ], "sumQuantity" : 92 }
{ "_id" : [ "MA", "CA", "NY", null ], "sumQuantity" : 60 }
{ "_id" : [ "NV", "CA", null ], "sumQuantity" : 224 }
{ "_id" : [ "IL", "NC", "MA", "FL", "AZ", null, null ], "sumQuantity" : 500 }
{ "_id" : [ "MA", "WA", null ], "sumQuantity" : 0 }
{ "_id" : [ "NV", null ], "sumQuantity" : 206 }
{ "_id" : [ "IL", "NY", "CA", "NJ", null ], "sumQuantity" : 90 }
Type "it" for more
>
```

```
kennedy.uzoho_snhu@msnv-snhu3-1001: /usr/local/datasets
File Edit View Search Terminal Help
> exit
bye
(base) kennedy.uzoho_snhu@msnv-snhu3-1001:/usr/local/datasets$ mongod_ctl stop
+++ Stopping MongoDB for kennedy.uzoho_snhu
(base) kennedy.uzoho_snhu@msnv-snhu3-1001:/usr/local/datasets$
```