

Atelier 3 Agrégation

```
C:\Users\Roua>mongoimport --db atelier2 --collection cities --file C:/Users/Roua/Downloads/zips.json
2024-12-02T15:53:26.846+0100 connected to: localhost
2024-12-02T15:53:26.958+0100 error inserting documents: E11000 duplicate key error collection: atelier2.cities index:
  _id_ dup key: { : "32350" }
2024-12-02T15:53:27.037+0100 error inserting documents: E11000 duplicate key error collection: atelier2.cities index:
  _id_ dup key: { : "63673" }
2024-12-02T15:53:27.118+0100 error inserting documents: E11000 duplicate key error collection: atelier2.cities index:
  _id_ dup key: { : "42223" }
2024-12-02T15:53:27.156+0100 imported 29470 documents
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```
> use atelier2
switched to db atelier2
> db.cities.aggregate([
... { $group: { _id: "$state", cities: { $push: "$city" } } }, // Group by state and push cities into an array
... { $sort: { "_id": 1 } } // Sort the results by state name (_id)
... ])
{ "_id" : "AK", "cities" : [ "ANCHORAGE", "98791", "ANCHORAGE", "ANCHORAGE", "ANCHORAGE", "FORT RICHARDSON", "ELMENDORF
AFB", "ANCHORAGE", "ANCHORAGE", "ANCHORAGE", "ANCHORAGE", "ANCHORAGE", "PORT HEIDEN", "AKIAK", "AKUTAN", "A
LAKANUK", "AKIACHAK", "COPPER CENTER", "COOPER LANDING", "CHENEGA BAY", "CROOKED CREEK", "KOLIGANEK", "EAGLE RIVER", "EE
K", "EGEGIK", "EKWOK", "FALSE PASS", "EMMONAK", "NELSON LAGOON", "GLENNALLEN", "MARSHALL", "SLANA", "GOODNEWS BAY", "GRA
YLING", "PORT GRAHAM", "HOLY CROSS", "SAINT GEORGE ISL", "KOKHANOK", "KALSKAG", "KASILOF", "HOOPER BAY", "KING COVE", "I
GIUGIG", "KENAT", "CHEFORNAK", "ALEKNAGIK", "NIKOLAEVSK", "KIPNUK", "CHEVAK", "KOTLIK", "KWETHLUK", "AKHIOK", "KWIGILLIN
GOK", "LEVELOCH", "LOWER KALSKAG", "MC GRATH", "MANOKOTAK", "MEKORYUK", "MOOSE PASS", "NAKNEK", "MOUNTAIN VILLAGE", "NEW
STUYAHOK", "NAPAKIAK", "NINILCHIK", "NIKOLSKI", "NONDALTON", "ANVIK", "CHIGNIK", "CHUATHBALUK", "CHIGNIK LAGOON", "WASI
LLA", "QUINHAGAK", "RUSSIAN MISSION", "RED DEVIL", "SAINT MICHAEL", "SAINT MARYS", "SAINT PAUL ISLAN", "SAND POINT", "SC
AMMON BAY", "SEWARD", "SHAGELUK", "SLEETHMUTE", "SOLDOTNA", "SOUTH NAKNEK", "PORT ALSWORTH", "STEBBINS", "STERLING", "TAL
KEETNA", "TUNUNAK", "TULUKSAK", "TRAPPER CREEK", "UNALAKLEET", "TYONEK", "VALDEZ", "UNALASKA", "WASILLA", "WILLOW", "YAK
UTAT", "NIKOLAI", "DUTCH HARBOR", "COLDFOOT", "EIELSON AFB", "CHUGIAK", "ATMAUTLUAK", "FAIRBANKS", "FAIRBANKS", "SALCHA",
"ALLAKAKET", "ANAKTUVUK PASS", "BARROW", "ARCTIC VILLAGE", "BETTLES FIELD", "BUCKLAND", "BEAVER", "NORTH POLÉ", "CENTR
AL", "CANTWELL", "CIRCLE", "PRUDHOE BAY", "DOT LAKE", "DEERING", "ELIM", "FORT YUKON", "GAMBELL", "GALENA", "HUGHES", "A
NDERSON", "HEALY", "KAKTOVIK", "KALTAG", "HUSLIA", "KIANA", "FORT WAINWRIGHT", "CLAM GULCH", "KOYUK", "CLEAR", "DENALI N
ATIONAL", "LAKE MINCHUMINA", "MINTO", "POINT LAY", "NENANA", "NOATAK", "GOLOVIN", "NOORVIK", "NULATO", "POINT HOPE", "RA
MPART", "RUBY", "SAVOONGA", "SHAKTOOLIK", "SELAWIK", "SHISHMAREF", "MANLEY HOT SPRIN", "SHUNGNAK", "TANANA", "STEVENS VI
```

```
> db.cities.aggregate([
... { $group: { _id: "$state", cities: { $push: "$city" } } }, //
... { $project: { state: "$_id", numberOfCities: { $size: "$cities" } } },
... { $sort: { "state": 1 } } // Sort by state
... ])
{ "_id" : "AK", "state" : "AK", "numberOfCities" : 196 }
{ "_id" : "AL", "state" : "AL", "numberOfCities" : 567 }
{ "_id" : "AR", "state" : "AR", "numberOfCities" : 578 }
{ "_id" : "AZ", "state" : "AZ", "numberOfCities" : 270 }
{ "_id" : "CA", "state" : "CA", "numberOfCities" : 1523 }
{ "_id" : "CO", "state" : "CO", "numberOfCities" : 416 }
{ "_id" : "CT", "state" : "CT", "numberOfCities" : 263 }
{ "_id" : "DC", "state" : "DC", "numberOfCities" : 24 }
{ "_id" : "DE", "state" : "DE", "numberOfCities" : 53 }
{ "_id" : "FL", "state" : "FL", "numberOfCities" : 826 }
{ "_id" : "GA", "state" : "GA", "numberOfCities" : 635 }
{ "_id" : "HI", "state" : "HI", "numberOfCities" : 80 }
{ "_id" : "IA", "state" : "IA", "numberOfCities" : 923 }
{ "_id" : "ID", "state" : "ID", "numberOfCities" : 244 }
{ "_id" : "IL", "state" : "IL", "numberOfCities" : 1240 }
{ "_id" : "IN", "state" : "IN", "numberOfCities" : 677 }
{ "_id" : "KS", "state" : "KS", "numberOfCities" : 726 }
{ "_id" : "KY", "state" : "KY", "numberOfCities" : 826 }
{ "_id" : "LA", "state" : "LA", "numberOfCities" : 469 }
{ "_id" : "MA", "state" : "MA", "numberOfCities" : 474 }
Type "it" for more
>
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4/

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> db.cities.aggregate([
...   {
...     $project: {
...       city: 1,
...       nameLength: { $strLenCP: "$city" },
...       cityLowerCase: { $toLower: "$city" }
...     }
...   }
... ])
{"_id": "35020", "city": "BESSEMER", "nameLength": 8, "cityLowerCase": "bessemer" }
{"_id": "35005", "city": "ADAMSVILLE", "nameLength": 10, "cityLowerCase": "adamsville" }
{"_id": "35023", "city": "HUEYTOWN", "nameLength": 8, "cityLowerCase": "hueytown" }
{"_id": "35043", "city": "CHELSEA", "nameLength": 7, "cityLowerCase": "chelsea" }
{"_id": "35045", "city": "CLANTON", "nameLength": 7, "cityLowerCase": "clanton" }
{"_id": "35044", "city": "COOSA PINES", "nameLength": 11, "cityLowerCase": "coosa pines" }
{"_id": "35049", "city": "CLEVELAND", "nameLength": 9, "cityLowerCase": "cleveland" }
{"_id": "35051", "city": "COLUMBIANA", "nameLength": 10, "cityLowerCase": "columbiana" }
{"_id": "35053", "city": "CRANE HILL", "nameLength": 10, "cityLowerCase": "crane hill" }
{"_id": "35054", "city": "CROPWELL", "nameLength": 8, "cityLowerCase": "cropwell" }
{"_id": "35061", "city": "DOLOMITE", "nameLength": 8, "cityLowerCase": "dolomite" }
{"_id": "35040", "city": "CALERA", "nameLength": 6, "cityLowerCase": "calera" }
{"_id": "35062", "city": "DORA", "nameLength": 4, "cityLowerCase": "dora" }
{"_id": "35064", "city": "FAIRFIELD", "nameLength": 9, "cityLowerCase": "fairfield" }
{"_id": "35063", "city": "EMPIRE", "nameLength": 6, "cityLowerCase": "empire" }
{"_id": "35068", "city": "COALBURG", "nameLength": 8, "cityLowerCase": "coalburg" }
{"_id": "35071", "city": "GARDENDALE", "nameLength": 10, "cityLowerCase": "gardendale" }
{"_id": "35072", "city": "GOODWATER", "nameLength": 9, "cityLowerCase": "goodwater" }
{"_id": "35073", "city": "ALDEN", "nameLength": 5, "cityLowerCase": "alden" }
{"_id": "35077", "city": "HANCEVILLE", "nameLength": 10, "cityLowerCase": "hanceville" }
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5/

```
> db.cities.find(
...   { pop: { $gt: 40000 } },
...   { _id: 1, city: 1, state: 1 } )
{"_id": "35020", "city": "BESSEMER", "state": "AL" }
{"_id": "35215", "city": "CENTER POINT", "state": "AL" }
{"_id": "35401", "city": "TUSCALOOSA", "state": "AL" }
{"_id": "35901", "city": "SOUTHSIDE", "state": "AL" }
{"_id": "85008", "city": "PHOENIX", "state": "AZ" }
{"_id": "85009", "city": "PHOENIX", "state": "AZ" }
{"_id": "85023", "city": "PHOENIX", "state": "AZ" }
{"_id": "85029", "city": "PHOENIX", "state": "AZ" }
{"_id": "85032", "city": "PHOENIX", "state": "AZ" }
{"_id": "85033", "city": "PHOENIX", "state": "AZ" }
{"_id": "85040", "city": "PHOENIX", "state": "AZ" }
{"_id": "85201", "city": "MESA", "state": "AZ" }
{"_id": "85202", "city": "MESA", "state": "AZ" }
{"_id": "85204", "city": "MESA", "state": "AZ" }
{"_id": "85224", "city": "CHANDLER", "state": "AZ" }
{"_id": "85282", "city": "TEMPE", "state": "AZ" }
{"_id": "85281", "city": "TEMPE", "state": "AZ" }
{"_id": "85301", "city": "GLENDALE", "state": "AZ" }
{"_id": "85364", "city": "YUMA", "state": "AZ" }
{"_id": "85710", "city": "TUCSON", "state": "AZ" }
Type "it" for more
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6/

```
> db.cities.aggregate([
...   { $match: { city: { $regex: "^AD", $options: "i" } } },
...   { $group: { _id: null, totalPopulation: { $sum: "$pop" } } }
... ])
{ "_id" : null, "totalPopulation" : 340517 }
```

7/

```
> db.cities.aggregate([
...   { $group: { _id: "$state", maxPopulation: { $max: "$pop" } } }
... ])
{ "_id" : "WY", "maxPopulation" : 33107 }
{ "_id" : "WI", "maxPopulation" : 57187 }
{ "_id" : "VA", "maxPopulation" : 68525 }
{ "_id" : "UT", "maxPopulation" : 55999 }
{ "_id" : "TX", "maxPopulation" : 79463 }
{ "_id" : "SD", "maxPopulation" : 45328 }
{ "_id" : "SC", "maxPopulation" : 66990 }
{ "_id" : "VT", "maxPopulation" : 39127 }
{ "_id" : "PA", "maxPopulation" : 80454 }
{ "_id" : "OH", "maxPopulation" : 66674 }
{ "_id" : "ND", "maxPopulation" : 42195 }
{ "_id" : "NY", "maxPopulation" : 111396 }
{ "_id" : "WV", "maxPopulation" : 70185 }
{ "_id" : "TN", "maxPopulation" : 60508 }
{ "_id" : "NJ", "maxPopulation" : 69646 }
{ "_id" : "NH", "maxPopulation" : 41438 }
{ "_id" : "NC", "maxPopulation" : 69179 }
{ "_id" : "MT", "maxPopulation" : 40121 }
{ "_id" : "MO", "maxPopulation" : 54994 }
{ "_id" : "MD", "maxPopulation" : 76002 }
Type "it" for more
```