

1.How many records does each airline class have? Use \$project to show result as { class: "Z", total: 999 }

```
> db.airlines.aggregate([
...   { $group: { _id: "$class", total: { $sum: 1 } } },
...   { $project: { _id: 0, class: "$_id", total: "$total" } }
... ])
{ "class" : "F", "total" : 140343 }
{ "class" : "P", "total" : 5683 }
{ "class" : "G", "total" : 17499 }
{ "class" : "L", "total" : 23123 }
```

2.What are the top 3 destination cities outside of the United States (destCountry field, not included) with the highest average passengers count? Show result as { "avgPassengers" : 2312.380, "city" : "Minsk, Belarus" }

```
> db.airlines.aggregate([
...   { $match: { "destCountry" : { $ne: "United States" } } },
...   { $group: { _id: "$destCity", avg: { $avg: "$passengers" } } },
...   { $sort: { avg: -1 } },
...   { $project: { _id: 0, avgPassengers: "$avg", city: "$_id" } },
...   { $limit: 3 }
... ])
{ "avgPassengers" : 8052.380952380952, "city" : "Abu Dhabi, United Arab Emirates" }
{ "avgPassengers" : 7176.596638655462, "city" : "Dubai, United Arab Emirates" }
{ "avgPassengers" : 7103.333333333333, "city" : "Guangzhou, China" }
```

3.Which carriers provide flights to Latvia (destCountry)? Show result as one document { "\_id" : "Latvia", "carriers" : [ "carrier1", "carrier2", ...] }

```
> db.airlines.aggregate([
...   { $match: { "destCountry": "Latvia" } },
...   { $group: { _id: "$destCountry", carriers: { $addToSet: "$carrier" } } }
... ])
{ "_id" : "Latvia", "carriers" : [ "Uzbekistan Airways", "JetClub AG", "Blue Jet SP Z o o" ] }
```

4.What are the carriers which flue the most number of passengers from the United State to either Greece, Italy or Spain? Find top 10 carriers, but provide the last 7 carriers (do not include the first 3). Show result as { "\_id" : "<carrier>", "total" : 999 }

```
> db.airlines.aggregate([
...   { $match: {
...     "originCountry": "United States",
...     "destCountry": { $in: ["Spain","Italy","Greece"] } }
...   },
...   { $group: { _id: "$carrier", total: { $sum: 1 } } },
...   { $sort: { total: -1 } },
...   { $limit: 10 },
...   { $skip: 3 }
... ])
{ "_id" : "Iberia Air Lines Of Spain", "total" : 41 }
{ "_id" : "VistaJet Limited", "total" : 38 }
{ "_id" : "Compagnia Aerea Italiana", "total" : 33 }
{ "_id" : "Cargolux Airlines International S.A", "total" : 21 }
{ "_id" : "Air Europa", "total" : 20 }
{ "_id" : "TAG Aviation Espana S.L.", "total" : 18 }
{ "_id" : "Atlas Air Inc.", "total" : 13 }
```

5. Find the city (originCity) with the highest sum of passengers for each state (originState) of the United States (originCountry). Provide the city for the first 5 states ordered by state alphabetically (you should see the city for Alaska, Arizona and etc). Show result as { "totalPassengers" : 999, "location" : { "state" : "abc", "city" : "xyz" } }

```
> db.airlines.aggregate([
...   { $match: { "originCountry": "United States" } },
...   { $group: { _id: { state: "$originState", city: "$originCity" }, passengers: { $sum: "$passengers" } } },
...   { $sort: { "passengers": -1 } },
...   { $group: { _id: "$_id.state", other: { $push: { passengers: "$passengers", city: "$_id.city" } } } },
...   { $project: { _id: "$_id", other: { $arrayElemAt: [ "$other", 0 ] } } },
...   { $project: { totalPassengers: "$other.passengers", location: { state: "$_id", city: "$other.city" }, _id: 0 } },
...   { $sort: { "location.state": 1 } },
...   { $limit: 5 }
... ])
{ "totalPassengers" : 760120, "location" : { "state" : "Alabama", "city" : "Birmingham, AL" } }
{ "totalPassengers" : 1472404, "location" : { "state" : "Alaska", "city" : "Anchorage, AK" } }
{ "totalPassengers" : 13152753, "location" : { "state" : "Arizona", "city" : "Phoenix, AZ" } }
{ "totalPassengers" : 571452, "location" : { "state" : "Arkansas", "city" : "Little Rock, AR" } }
{ "totalPassengers" : 23701556, "location" : { "state" : "California", "city" : "Los Angeles, CA" } }
```

## Aggregate Enron Collection

Which pair of people have the greatest number of messages in the dataset?

```
> db.enron.aggregate([{$addFields: {'headers.ToUnique': {'$setUnion': ['$headers.To', []]}}, {$unwind: {'path': '$headers.ToUnique'}}, {$group: {'_id': {'from': '$headers.From', 'to': '$headers.ToUnique'}, 'count': {'$sum': 1}}}, {$sort: {'count': -1}}, {$limit: 1}]).pretty()
{
  "_id" : {
    "from" : "susan.mara@enron.com",
    "to" : "jeff.dasovich@enron.com"
  },
  "count" : 750
}
```