In this lecture, we will discuss…

- ✧ SQL to Mongo mapping
- ✧ Aggregation framework
- ✧ Aggregation pipelines
- ✧ Aggregation example

SQL to Mongo (Aggregation)

SQL	Mongo
WHERE	$match
GROUP BY	$group
SELECT	$project
ORDER BY	$sort
LIMIT	$limit
SUM()	$sum
COUNT()	$count

SQL	Mongo
SELECT COUNT(*) AS count FROM zips	db[:zips].find.aggregate([{:$group => { :_id => 0,count:{:$sum => 1}}}])
SELECT SUM(pop) AS total FROM zips	db[:zips].find.aggregate([{ :$group => { :_id =>0, total: {:$sum => "$pop" }}}])

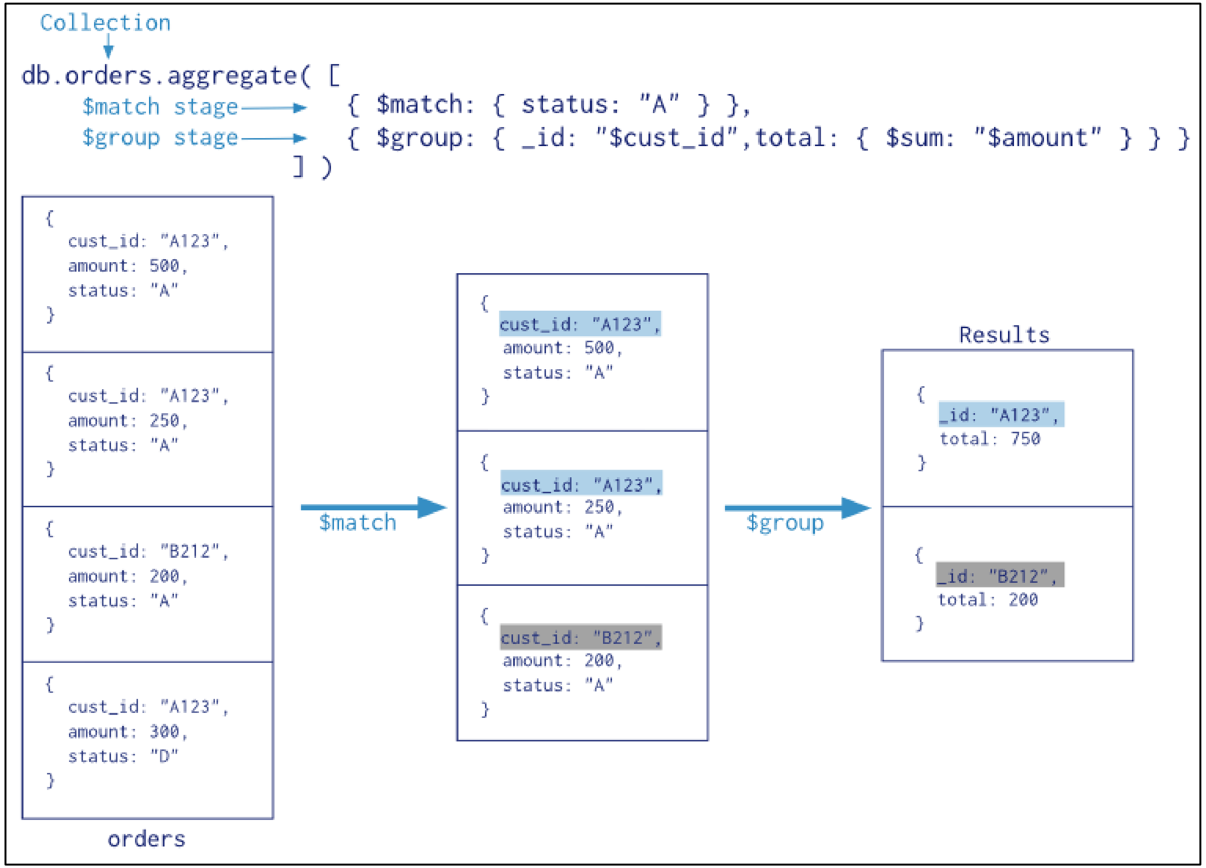
Aggregation Framework

- ✧ Aggregations - operations that process data records and return computed results
- ✧ MongoDB provides a rich set of aggregation operations like:
  - $project, $group, $match, $unwind, $sum, $limit
- ✧ Running data aggregation on the mongo instance simplifies application code and limits resource requirements

Aggregation “pipeline”

- ✧ Data processing pipeline
- ✧ Filters that operate like queries
- ✧ Grouping and sorting
- ✧ Use of operators to return calculated documents
- ✧ Ex: $limit, $sort, $skip etc…

Aggregation Example



```
db.orders.aggregate( [
      { $match: { status: "A" } },
      { $group: { _id: "$cust_id",total: { $sum: "$amount" } } }
   ] )
```

orders:

```
{
   cust_id: "A123",
   amount: 500,
   status: "A"
}
{
   cust_id: "A123",
   amount: 250,
   status: "A"
}
{
   cust_id: "B212",
   amount: 200,
   status: "A"
}
{
   cust_id: "A123",
   amount: 300,
   status: "D"
}
```

After $match:

```
{
   cust_id: "A123",
   amount: 500,
   status: "A"
}
{
   cust_id: "A123",
   amount: 250,
   status: "A"
}
{
   cust_id: "B212",
   amount: 200,
   status: "A"
}
```

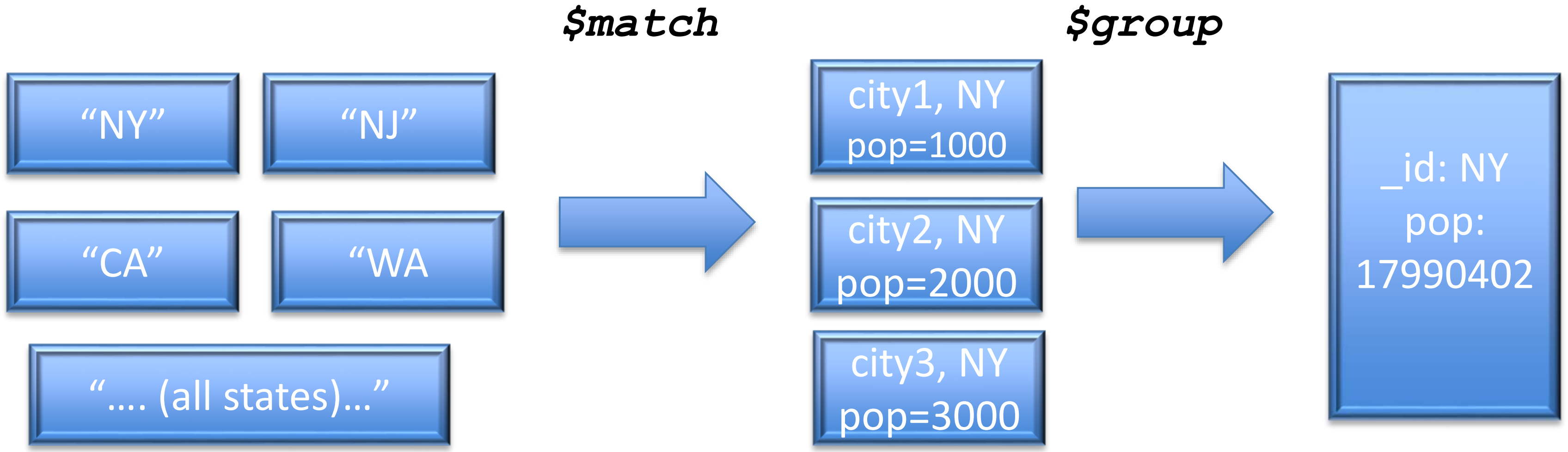
Results:

```
{
   _id: "A123",
   total: 750
}
{
   _id: "B212",
   total: 200
}
```

Source: mongodb.org

Aggregation Example

- `db[:zips].find().aggregate([{:$match=>{:state =>'NY'}}, {:$group=>{ :_id=>'NY', :population=>{:$sum=>'$pop'}}}]).to_a`



```
{ "_id" : "NY", "pop" : 17990402 }
```

Summary

- Aggregation – powerful operations to process data records and return customized results
- Document transformations that modify the form of the output document

What's Next?

- $project