MQL vs. The Aggregation Framework

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Terms

Terms to know in the context of MongoDB

- Database - An organized collection of structured data
- Collection - A collection of documents, analogous to a SQL table
- Document - A JSON (JavaScript Object Notation) document, a collection of fields and values
- Query - A request for data from a database

The Similarities - What We Can Do with Both

01	**CRUD operations**	• Create new documents • Read documents from the collection • Update values of fields in documents • Delete documents
02	**Filter Data**	• Find or match documents based on the values of their fields • Select which fields to display
03	**Accessed from mongosh**	• Both can be used from the MongoDB shell • Both are also usable with the MongoDB API

Differences - What Can We Do with MQL?

		MQL	Aggregation	Notes
1	Locate data, show or hide fields, perform calculations on data	✓	✓	• We can find data with the find() command • We can also show/hide fields with the find() command • We can do this with the aggregation pipeline too
2	Add and remove documents, update values	✓	✓	• Can be done with MQL or aggregation pipeline
3	Create new fields by performing operations on existing ones	✗	✓	• This is a functionality available only with the $project stage of the aggregation pipeline

Example - MQL

Query

```
use sample_training

db.zips.find({"state": "NY"})

db.zips.find({"state": "NY"}).count()

db.zips.find({"state": "NY", "city":
"ALBANY"}).pretty()

db.zips.find({"state": "NY", "city":
"ALBANY"},{"zip":1, "city":1, "pop":1,
"_id":0}).pretty()
```

Result

```
[
  { city: 'ALBANY', zip: '12204', pop: 6927 },
  { city: 'ALBANY', zip: '12206', pop: 17230 },
  { city: 'ALBANY', zip: '12207', pop: 2709 },
  { city: 'ALBANY', zip: '12208', pop: 22041 },
  { city: 'ALBANY', zip: '12209', pop: 10008 },
  { city: 'ALBANY', zip: '12202', pop: 11097 },
  { city: 'ALBANY', zip: '12210', pop: 9374 }
]
```

Adapted from M001, chapter 2

Differences - What Can We Do with Aggregation?

- Everything we can do with MQL and more!
- Perform transformations on our data in stages
  - The pipeline is an ordered collection of operations
  - The output of one stage is the input of the next
  - Just like a pipeline carrying water
- Filter documents within our collection
- Create new fields by performing calculations on existing ones
- Group documents using information about them

Activity

- A 10 minute activity explaining the stages of the aggregation framework and their applications
- The activity includes a visual representation of the pipeline
- It's a game, including a score and badges awarded for speed and correctness
- The goal is to assemble the data in the right order, such that the pipeline produces the correct output
- The game is meant to be expanded
- You can find it here:
  - https://replit.com/@EliUdler/MongoDB-Activity?c=176008
  - You will need to create a Replit account and fork the Repl for it to work properly