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OFFICE HOURS

Sunday 11am
Mon 7pm
Tues 3:30pm
Thurs 8pm

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QUIZ!

- The next quiz will be available from Friday to Sunday of this week
- Topics:
  - JSON, AJAX, SQL

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BEST AND WORST …

- Worst website!
  - http://www.suzannecollinsbooks.com/works.htm
- Best Website!
  - https://www.katevassgalerie.com/

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FINAL PROJECT TIMELINE

- Week 12 (4/5): finalize concept, set up dev environment, establish roles, project architected
- Week 13 (4/12): coding, "trial and error" testing
- Week 14 (4/19): MVP working / Lightening talks
- Week 15 (4/26): testing and enhancements

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RECALL: NOSQL DATABASE

- Better for massive amount of data
- No schema
- No tables (documents)
- Key value pairs
- No query language

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- Document based
- JSON format
- High performance
- Easily Scalable
- Open source
- Data stored as BSON: Binary encoded JSON documents

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MONGODB.ATLAS

- Online environment for hosting databases
- Can connect to server side program (node.js)
- Allows for insert/update/query of data
- Allows for users / data access permissions
- Sample data can be loaded as a sandbox to practice

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SET UP A MONGODB ATLAS ACCOUNT

- Go to https://www.mongodb.com/cloud/atlas
- Create a project
- Create a cluster
- Load sample data
- Add your own data

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COLLECTIONS AND DOCUMENTS

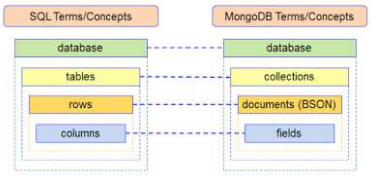

Image credit: https://www.analyticsvidhya.com/blog/2015/06/beginners-guide-mongodb/

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EXAMPLE

Products
id, name, price

RDBMS: store data in a table called products

Id	Name	Price
10	Widget	3.5

MongoDB: create a collection which has only one document in this case

```
{
  id: 10,
  name: "Widget",
  price: 3.5
}
```

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TRY IT

- Create a MongoDB collection of textbooks
- Book 1: Competitive Swimming by Bob Smith
- Book 2: Coding for Dummies by John Jones

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SQL VS MONGODB DATABASE

- When designing the database, think about the entities and the corresponding data
- Redundant data is ok. Memory is cheap. *Optimize for performance.*

Key Point
Data is "joined" as you create a document
– NOT when you retrieve the data

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EXAMPLE

RDBMS:

- *Tables are related* via a primary key – foreign key relationship
- "Join" the data on retrieval
- select * from products
  inner join suppliers
  on products.supplier_id = suppliers.id

MongoDB:"join" the data as you create it:

```
{
  id: 10
  name:"widget"
  price: 3.5,
  supplier {
    id: 101
    name: "Acme Inc"
    phone:"999-999-9999" }
}
```

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TRY IT: ADD A PUBLISHER FOR EACH BOOK

- Book 1: Competitive Swimming by Bob Smith, Published by Wiley, NJ
- Book 2: Coding for Dummies by John Jones, Published by Pearson, UK

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COLLECTION OPTIONS

- Capped Collection
  - When you create a collection you can specify that it is capped
    - Limit memory size
    - Limit of # of documents
  - When the specified limits are reached, it automatically deletes the oldest entries
- Auto index
  - _id field must be unique in a document
  - Specify the autoIndexId option to have it automatically assigned

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DATA TYPES

- String
- Integer
- Double
- Boolean
- Array
- Object
- … and more

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QUERY FILTERS: FIND

- Analogous to WHERE clause in SQL
- Equality (field equals a value)
  - {"field" :"value"}
- Comparison (less than/greater than/etc.)
  - $lt, $lte, $gt, $gte, $ne
  - {"field" : {$gt: 10}}

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TRY IT

- In the sample_mflix database
  - Find the document for the movie: Gertie the Dinosaur
  - Find all movies from 2015
  - Find all movies with a running time of 30 min or less

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QUERY FILTERS: AND / OR

- $and, $or

```
{
    $and: [
      {"field1":"value1"}, {"field2":"value2"}
    ]
}
```

```
{
    $or: [
      {"field1":"value1"}, {"field2":"value2"}   ]
}
```

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TRY IT

- In the sample_supplies database
  - Find sales that occurred in Austin or Denver
  - Find all online sales from London

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"LIKE" QUERIES

- To find a patterned value, use a regular expression:
- {"field": /val/} … find anywhere
- {"field": /^val/} … starts with

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TRY IT

- In the sample_mflix database,
  - Find movies that start with the letter "L"
  - Find movies with the word "men" in the plot

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QUERYING ARRAYS

- Check if the array contains at least one document with a value
  - {"field":"val"}
- Find documents with the exact array structure
  - { "field": ["val1","val2"] }
  - { "pet_name": ["fido","fifi"] }
- Find documents that match all specified items: $all
  - Order does not matter
  - There can be other items in the array as well
  - { "field": { $all: ["val1", "val2"] } }

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TRY IT

- In the sample_mflix database,
  - Find comedy movies (hint: look in the "genre")
  - Find comedy movies that are also a drama

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