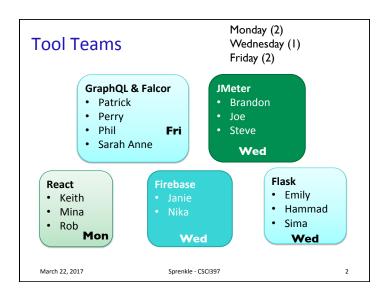
Objectives

- Project Prep
- Data: MongoDB

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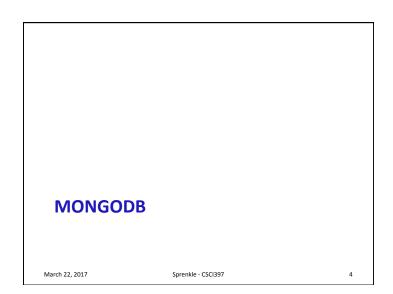


Review

- What data storage/search mechanisms have we talked about so far?
 - > How do we access them?
 - > What can we do with them?
 - ➤ What are their relative strengths and limitations?

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MongoDB Overview

- NoSQL
 - > Documents rather than records
- Represents JSON documents in BSON (binaryencoded format)
 - ➤ Benefits: provide additional data types, ordered fields, efficient for encoding and decoding within different languages

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MongoDB

db.getCollectionNames()

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CRUD Examples

```
> db.user.find ({
    "first" : "John",
> db.user.insert({
    first: "John",
    last: "Doe",
                                  "last" : "Doe",
                                  "age" : 39
    age: 39
})
                             })
> db.user.update(
    {"_id" :
ObjectId("51...")},
                              > db.user.remove({
                                  "first": /^J/
       $set: {
                              })
          age: 40,
          salary: 7000}
                             DELETE * FROM user WHERE
                             first LIKE "J%";
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```

Inserting

- db.collectionname.insert(document)
 - ➤ Document → JSON
 - b db.customers.insert({"name": "Jane Doe"})

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Search: find()

- db.bank.findOne()
- db.bank.find()
- db.bank.find().pretty()
- db.bank.find({lastname: "Johnson"})

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What are these queries finding?

- db.bank.find({ age : { \$gt : 35 }})db.bank.find({ age : { \$gte : 40 }})
- odb.bank.find({ state : { \$in : ["VA",
 "PA"] }})
- db.bank.find({ \$and : [{ balance :
 {\$gt : 40000} }, {age : {\$lt : 25 }}] })

Now, find just the women

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Functions

- count(query, options)
 - https://docs.mongodb.com/manual/reference/ method/db.collection.count/#db.collection.count
- distinct(field, query, options)
 - https://docs.mongodb.com/manual/reference/ method/db.collection.distinct/#db.collection.distinct

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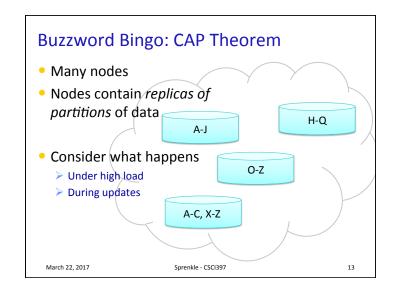
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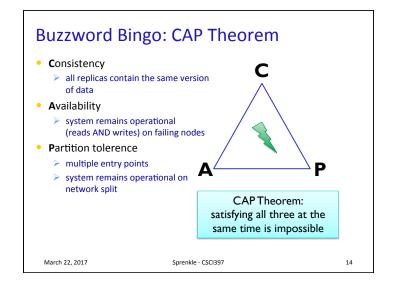
Comparing Schema Design

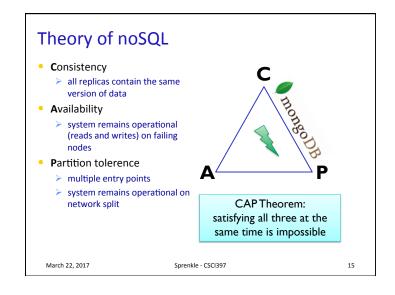
- SQL: Optimizing how data is stored
- MongoDB: Optimize how data is used
- SQL: What answers do I have?
- MongoDB: What questions do I have?

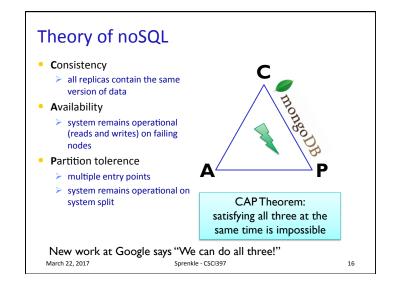
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Benefits

- Speed!
- Rich dynamic queries
- Lazy creation
- Schema-less
- Returns JSON
- Easy Replication and Failover
- Auto-Sharding
- MapReduce

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Looking Ahead

- Fri: Tool Team work
- Mon: Tool Team work
- Wed
 - > Richard Marmorstein's talk
 - Due: Assign 7
 - ➤ Tool: What do we need installed?

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Limitations

- No Transactions
 - ➤ Not good for purchases, banking, inventory
- No Joins
- RAM intensive
- No referential integrity
- Eventual Consistency

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