

# In this lecture, we will discuss...

- ✧ Single field command

- ✧ `explain` command

- ✧ Creating indexes

- `create_one`

- ✧ Compound Index

- `create_many`

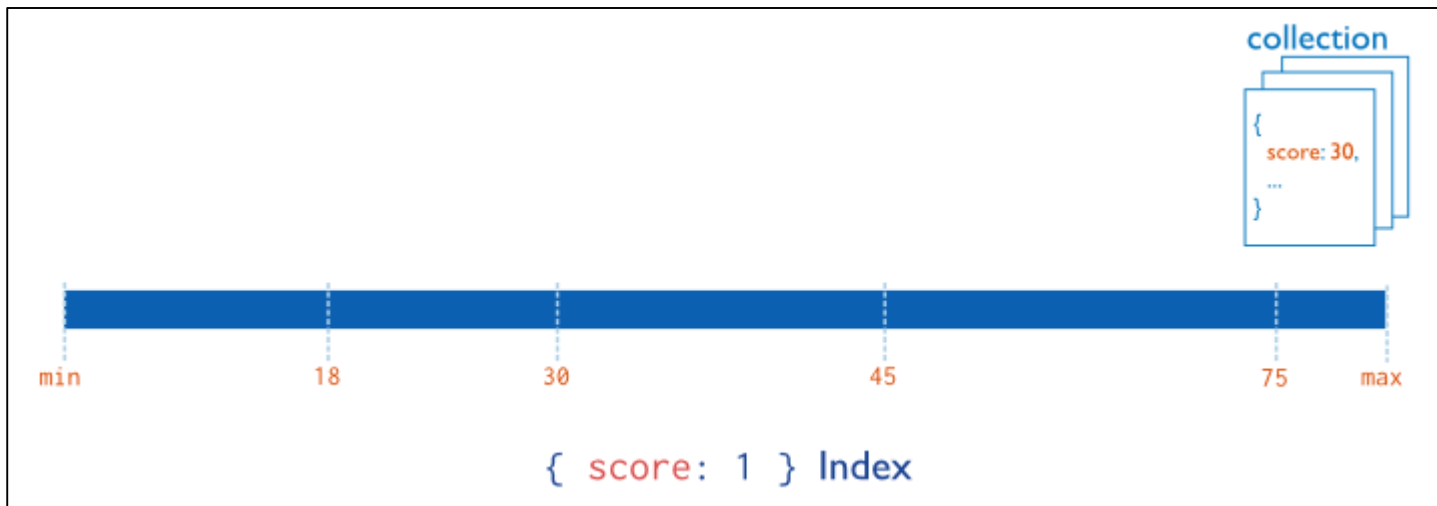


# Single Field Index

- ✧ By **default**, all collections have an **index** (\_id field)
- ✧ MongoDB supports indexes that contain **either** a single field **or** multiple fields depending on the **operations** that this index-type supports



# Single Field Index



Example: Index on the score field

*source: [mongodb.org](http://mongodb.org)*

# explain Command

- ✧ What is the database **doing** to your query?
  - Provides information on the **query plan**
- ✧ `pp db[:zip].find(:state => 'MD').explain`
- ✧ The explain() method **returns a document** with the query plan and, **optionally**, the execution statistics



# explain Command

✧ `pp db[:zips].find(:state => 'MD').explain`

✧ **Parsed Query**

✧ **Total documents scanned**

```
"namespace"=>"test.zips",
"indexFilterSet"=>false,
"parsedQuery"=>{"state"=>{"$eq"=>"MD"}},
"winningPlan"=>
{"stage"=>"COLLSCAN",
"filter"=>{"state"=>{"$eq"=>"MD"}},
"direction"=>"forward",
"rejectedPlans"=>[]},
executionStats"=>
{"executionSuccess"=>true,
"nReturned"=>421,
"executionTimeMillis"=>14,
"totalKeysExamined"=>0,
"totalDocsExamined"=>29354,
"executionStages"=>
{"stage"=>"COLLSCAN",
"filter"=>{"state"=>{"$eq"=>"MD"}},
"nReturned"=>421,
"executionTimeMillisEstimate"=>20,
"works"=>29356,
"advanced"=>421,
"needTime"=>28934,
"needFetch"=>0,
"saveState"=>229,
"restoreState"=>229,
"isEOF"=>1,
"invalidates"=>0,
"direction"=>"forward",
"docsExamined"=>29354},
"allPlansExecution"=>[]},
serverInfo"=>
{"host"=>"Falcon",
"port"=>27017,
"version"=>"3.0.4"}
```

# create\_one Command

- ✧ Creates indexes on **collections**
- ✧ `db[:zips].indexes.create_one({ :state  
=> 1 })`
- ✧ Above example creates an **ascending index** on the field `state`

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# create\_one Command

✧ `pp db[:zip].find(:state => 'MD').explain`

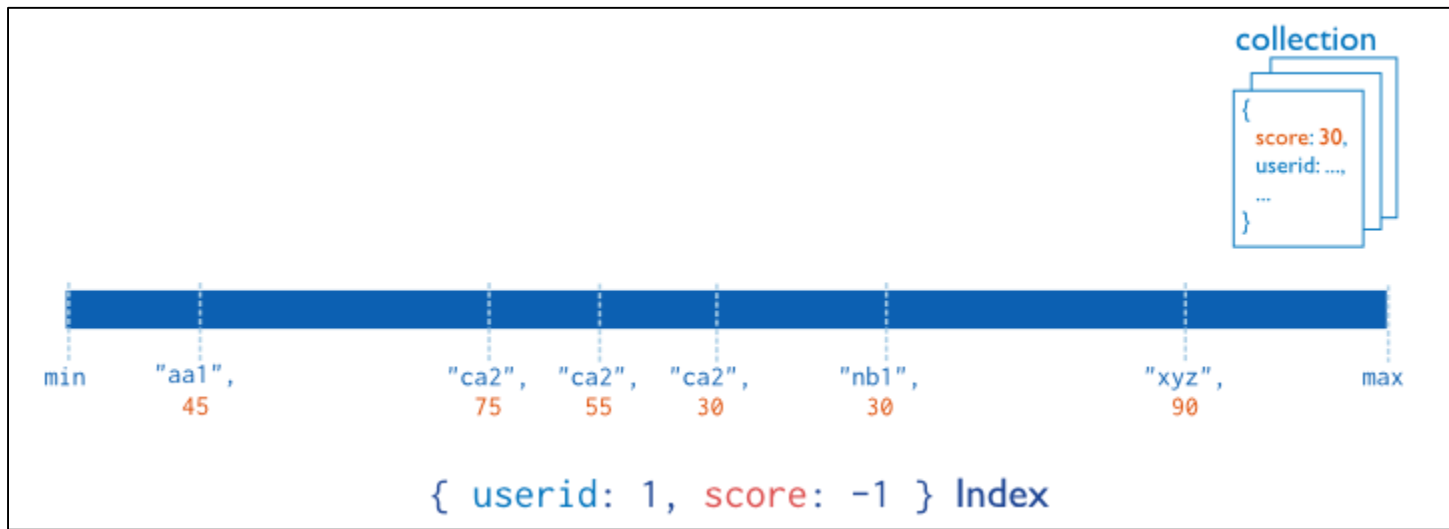
✧ Query

✧ Documents scanned

```
{ "plannerVersion" => 1,
  "namespace" => "test.zip",
  "indexFilterSet" => false,
  "parsedQuery" => {"state" => {"$eq" => "MD"}},
  "winningPlan" =>
    { "stage" => "FETCH",
      "inputStage" =>
        { "stage" => "IXSCAN",
          "keyPattern" => {"state" => 1},
          "indexName" => "state_1",
          "isMultiKey" => false,
          "direction" => "forward",
          "indexBounds" => {"state" => ["["MD", \\",
            "rejectedPlans" => []],
          "executionStats" =>
            { "executionSuccess" => true,
              "nReturned" => 421,
              "executionTimeMillis" => 7,
              "totalKeysExamined" => 421,
              "totalDocsExamined" => 421,
              "executionStages" =>
                { "stage" => "FETCH",
                  "nReturned" => 421,
                  "executionTimeMillisEstimate" => 0,
                  "works" => 422,
                  "advanced" => 421,
```

# Compound Indexes

- ✧ Single index structure holds references to multiple fields within a collection's documents



*source: mongodb.org*



# Compound Indexes

- ✧ `create_many` – will create **multiple** indexes on a collection
- ✧ 

```
db[:zip].indexes.create_many([ { :key =>
  { state: 1 } },
  { :key => { city: 1 } }])
```

*Note: **1** is ASC and **-1** is DESC*



# Summary

- ✧ Indexes support the efficient execution of queries in MongoDB
- ✧ Explain – provides execution plan details on your query

## What's Next?

- ✧ Listing and deleting index

