

PE29 Vasu Kalariya

Aggregation Operation

Create database Company.

```
> use company
```

```
switched to db company
```

```
>
```

```
> show collections
```

```
employee
```

```
>
```

```
> db.employee.find().pretty().limit(1)
```

```
{
  "_id" : ObjectId("607bd69e051525164347d06d"),
  "firstName" : "James",
  "lastName" : "Smith",
  "age" : 20,
  "Address" : {
    "streetAddress" : "777 Brockton Avenue",
    "city" : "Abington",
    "state" : "MA",
    "postalCode" : 2351
  },
  "phoneNumber" : [
    {
      "type" : "home",
      "number" : 4661632082
    },
    {
      "type" : "fax",
      "number" : 2899829351
    }
  ],
  "emailAddress" : [
    "jamesS@gamil.com",
    "SJames@gmail.com"
  ]
}
```

```
>
```

```
>
```

```
> db.employee.count()
```

```
23
```

```
>
```

-----Display state vise total employee-----

```
> db.employee.aggregate([
... {$group: {_id: "$Address.state", Count: {$sum: 1}}}
... ])
{ "_id" : "AL", "Count" : 1 }
{ "_id" : "MA", "Count" : 7 }
{ "_id" : "CT", "Count" : 3 }
{ "_id" : "NY", "Count" : 12 }
>
```

-----Display count of employees of 'NY' state-----

```
> db.employee.aggregate([
... {$match: {"Address.state": "NY"}},
... {$group: {_id: "$Address.state", Count: {$sum: 1}}}
... ])
{ "_id" : "NY", "Count" : 12 }
```

-----Display all the states where more than 10 employees are working-----

```
> db.employee.aggregate([
... {$group: {_id: "$Address.state", Count: {$sum: {$gt: 10}}}},
... ])
```

uncaught exception: Error: command failed: {

```
  "ok" : 0,
  "errmsg" : "Expression $gt takes exactly 2 arguments. 1 were passed in.",
  "code" : 16020,
  "codeName" : "Location16020"
```

} with original command request: {

```
  "aggregate" : "employee",
  "pipeline" : [
    {
      "$group" : {
        "_id" : "$Address.state",
        "Count" : {
          "$sum" : {
            "$gt" : 10
          }
        }
      }
    }
  ]
}
```

```
  ],
  "cursor" : {
```

```
  },
  "lsid" : {
    "id" : UUID("6f1850ea-f8f0-4cc3-acf7-10a6e7fdf357")
  }
}
```

```
} on connection: connection to 127.0.0.1:27017 : aggregate failed :
_getErrorWithCode@src/mongo/shell/utils.js:25:13
doassert@src/mongo/shell/assert.js:18:14
_assertCommandWorked@src/mongo/shell/assert.js:719:17
assert.commandWorked@src/mongo/shell/assert.js:811:16
DB.prototype._runAggregate@src/mongo/shell/db.js:268:5
DBCollection.prototype.aggregate@src/mongo/shell/collection.js:1056:12
@(shell):1:1
```

```
>
> db.employee.aggregate([
... {$group: {_id: "$Address.state", Count: {$sum: 1}}},
... {$match: {Count: {$gt: 10}}}
... ])
{ "_id" : "NY", "Count" : 12 }
>
```

```
*****
-----Display count of employees having age less than 30-----
```

```
> db.employee.aggregate([
... {$match: {age: {$lt: 30}}},
... {$group: {_id: null, Count: {$sum: 1}}},
... ])
{ "_id" : null, "Count" : 13 }
>
```

```
*****
-----Display name of employees having more than two phone nos.-----
```

```
> db.employee.aggregate([
... {$group: {_id: "phoneNumber", Count: {$sum: 1}}},
... {$match: {Count: {$gt: 2}}},
... {$project: {_id: 0, firstName: 1, lastName: 1}}
... ])
{ }
>
> db.employee.aggregate([
... {$project: {_id: 0, firstName: 1, lastName: 1, Count: {"$size": "$phoneNumber"}}},
... {$match: {Count: {$gt: 2}}}
... ])
{ "firstName" : "Alise", "lastName" : "Pickrell", "Count" : 3 }
{ "firstName" : "Leticia", "lastName" : "Wrobel", "Count" : 3 }
{ "firstName" : "Michele", "lastName" : "Gault", "Count" : 3 }
{ "firstName" : "Azalee", "lastName" : "Racey", "Count" : 3 }
{ "firstName" : "Will", "lastName" : "Strout", "Count" : 3 }
{ "firstName" : "Cesar", "lastName" : "Bannon", "Count" : 3 }
{ "firstName" : "Yvonne", "lastName" : "Gingerich", "Count" : 3 }
>
```

-----How many employees have provided home phone no-----

```
> db.employee.aggregate([
... {$match:{"phoneNumber.type":"home"}},
... {$group: {_id:null,Count:{$sum:1}}}
... ])
{ "_id" : null, "Count" : 23 }
>
```

-----Display employee wise count of email addresses.-----

```
> db.employee.aggregate([
... {$project: {_id:0, firstName:1, lastName:1, Count:{"$size":"$emailAddress"}}}
... ])
{ "firstName" : "James", "lastName" : "Smith", "Count" : 2 }
{ "firstName" : "Michael", "lastName" : "Smith", "Count" : 2 }
{ "firstName" : "Robert", "lastName" : "Smith", "Count" : 2 }
{ "firstName" : "Maria", "lastName" : "Garcia", "Count" : 2 }
{ "firstName" : "David", "lastName" : "Smith", "Count" : 2 }
{ "firstName" : "Maria", "lastName" : "Rodriguez", "Count" : 2 }
{ "firstName" : "Mary", "lastName" : "Smith", "Count" : 2 }
{ "firstName" : "Maria", "lastName" : "Hernandez", "Count" : 2 }
{ "firstName" : "Lilly", "lastName" : "Martinez", "Count" : 2 }
{ "firstName" : "James", "lastName" : "Johnson", "Count" : 2 }
{ "firstName" : "Kamilah", "lastName" : "Earhart", "Count" : 3 }
{ "firstName" : "Alise", "lastName" : "Pickrell", "Count" : 2 }
{ "firstName" : "Leticia", "lastName" : "Wrobel", "Count" : 3 }
{ "firstName" : "Caridad", "lastName" : "Kendall", "Count" : 2 }
{ "firstName" : "Michele", "lastName" : "Gault", "Count" : 3 }
{ "firstName" : "Azalee", "lastName" : "Racey", "Count" : 2 }
{ "firstName" : "Kathlyn", "lastName" : "Hackenberg", "Count" : 2 }
{ "firstName" : "Edie", "lastName" : "Burststein", "Count" : 3 }
{ "firstName" : "Will", "lastName" : "Strout", "Count" : 2 }
{ "firstName" : "Cesar", "lastName" : "Bannon", "Count" : 2 }
Type "it" for more
> it
{ "firstName" : "Hanna", "lastName" : "Voliva", "Count" : 3 }
{ "firstName" : "Yvonne", "lastName" : "Gingerich", "Count" : 2 }
{ "firstName" : "Jackie", "lastName" : "Wolfenbarger", "Count" : 2 }
>
```

```
> db.employee.find({"Address.postalCode":1524}).explain()
{
  "explainVersion" : "1",
  "queryPlanner" : {
```

```

    "namespace" : "company.employee",
    "indexFilterSet" : false,
    "parsedQuery" : {
      "Address.postalCode" : {
        "$eq" : 1524
      }
    },
    "queryHash" : "E28F6A5F",
    "planCacheKey" : "E28F6A5F",
    "maxIndexedOrSolutionsReached" : false,
    "maxIndexedAndSolutionsReached" : false,
    "maxScansToExplodeReached" : false,
    "winningPlan" : {
      "stage" : "COLLSCAN",
      "filter" : {
        "Address.postalCode" : {
          "$eq" : 1524
        }
      }
    },
    "direction" : "forward"
  },
  "rejectedPlans" : [ ]
},
"command" : {
  "find" : "employee",
  "filter" : {
    "Address.postalCode" : 1524
  },
  "$db" : "company"
},
"serverInfo" : {
  "host" : "DESKTOP-43A64G1",
  "port" : 27017,
  "version" : "4.9.0-rc0",
  "gitVersion" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
},
"serverParameters" : {
  "internalQueryFacetBufferSizeBytes" : 104857600,
  "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
  "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
  "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
  "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
  "internalQueryProhibitBlockingMergeOnMongoS" : 0,
  "internalQueryMaxAddToSetBytes" : 104857600,
  "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
},
"ok" : 1
}
>

```

```

> db.employee.find({"Address.postalCode":1524}).explain("executionStats")
{
  "explainVersion" : "1",
  "queryPlanner" : {
    "namespace" : "company.employee",
    "indexFilterSet" : false,
    "parsedQuery" : {
      "Address.postalCode" : {
        "$eq" : 1524
      }
    },
    "maxIndexedOrSolutionsReached" : false,
    "maxIndexedAndSolutionsReached" : false,
    "maxScansToExplodeReached" : false,
    "winningPlan" : {
      "stage" : "COLLSCAN",
      "filter" : {
        "Address.postalCode" : {
          "$eq" : 1524
        }
      },
      "direction" : "forward"
    },
    "rejectedPlans" : [ ]
  },
  "executionStats" : {
    "executionSuccess" : true,
    "nReturned" : 1,
    "executionTimeMillis" : 0,
    "totalKeysExamined" : 0,
    "totalDocsExamined" : 23,
    "executionStages" : {
      "stage" : "COLLSCAN",
      "filter" : {
        "Address.postalCode" : {
          "$eq" : 1524
        }
      },
      "nReturned" : 1,
      "executionTimeMillisEstimate" : 0,
      "works" : 25,
      "advanced" : 1,
      "needTime" : 23,
      "needYield" : 0,
      "saveState" : 0,
      "restoreState" : 0,
      "isEOF" : 1,
      "direction" : "forward",
      "docsExamined" : 23
    }
  }
}

```

```

    },
    "command" : {
      "find" : "employee",
      "filter" : {
        "Address.postalCode" : 1524
      },
      "$db" : "company"
    },
    "serverInfo" : {
      "host" : "DESKTOP-43A64G1",
      "port" : 27017,
      "version" : "4.9.0-rc0",
      "gitVersion" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
    },
    "serverParameters" : {
      "internalQueryFacetBufferSizeBytes" : 104857600,
      "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
      "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
      "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
      "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
      "internalQueryProhibitBlockingMergeOnMongoS" : 0,
      "internalQueryMaxAddToSetBytes" : 104857600,
      "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
    },
    "ok" : 1
  }
}
>

```

```

*****

> db.employee.find({"firstName":"Kathlyn"}).explain("executionStats")
{
  "explainVersion" : "1",
  "queryPlanner" : {
    "namespace" : "company.employee",
    "indexFilterSet" : false,
    "parsedQuery" : {
      "firstName" : {
        "$eq" : "Kathlyn"
      }
    },
    "maxIndexedOrSolutionsReached" : false,
    "maxIndexedAndSolutionsReached" : false,
    "maxScansToExplodeReached" : false,
    "winningPlan" : {

```

```

        "stage" : "COLLSCAN",
        "filter" : {
            "firstName" : {
                "$eq" : "Kathlyn"
            }
        },
        "direction" : "forward"
    },
    "rejectedPlans" : [ ]
},
"executionStats" : {
    "executionSuccess" : true,
    "nReturned" : 1,
    "executionTimeMillis" : 0,
    "totalKeysExamined" : 0,
    "totalDocsExamined" : 23,
    "executionStages" : {
        "stage" : "COLLSCAN",
        "filter" : {
            "firstName" : {
                "$eq" : "Kathlyn"
            }
        },
        "nReturned" : 1,
        "executionTimeMillisEstimate" : 0,
        "works" : 25,
        "advanced" : 1,
        "needTime" : 23,
        "needYield" : 0,
        "saveState" : 0,
        "restoreState" : 0,
        "isEOF" : 1,
        "direction" : "forward",
        "docsExamined" : 23
    }
},
"command" : {
    "find" : "employee",
    "filter" : {
        "firstName" : "Kathlyn"
    },
    "$db" : "company"
},
"serverInfo" : {
    "host" : "DESKTOP-43A64G1",
    "port" : 27017,
    "version" : "4.9.0-rc0",
    "gitVersion" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
},
"serverParameters" : {

```



```

        "internalQueryFacetBufferSizeBytes" : 104857600,
        "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
        "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
        "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
        "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
        "internalQueryProhibitBlockingMergeOnMongoS" : 0,
        "internalQueryMaxAddToSetBytes" : 104857600,
        "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
    },
    "ok" : 1
}
>

```

```

> db.employee.find({"emailAddress":"WLeticia@gmail.com"}).explain("executionStats")
{
  "explainVersion" : "1",
  "queryPlanner" : {
    "namespace" : "company.employee",
    "indexFilterSet" : false,
    "parsedQuery" : {
      "emailAddress" : {
        "$eq" : "WLeticia@gmail.com"
      }
    },
    "maxIndexedOrSolutionsReached" : false,
    "maxIndexedAndSolutionsReached" : false,
    "maxScansToExplodeReached" : false,
    "winningPlan" : {
      "stage" : "COLLSCAN",
      "filter" : {
        "emailAddress" : {
          "$eq" : "WLeticia@gmail.com"
        }
      }
    },
    "direction" : "forward"
  },
  "rejectedPlans" : [ ]
},
  "executionStats" : {
    "executionSuccess" : true,
    "nReturned" : 1,
    "executionTimeMillis" : 0,
    "totalKeysExamined" : 0,
    "totalDocsExamined" : 23,
    "executionStages" : {

```

```

        "stage" : "COLLSCAN",
        "filter" : {
            "emailAddress" : {
                "$eq" : "WLeticia@gmail.com"
            }
        },
        "nReturned" : 1,
        "executionTimeMillisEstimate" : 0,
        "works" : 25,
        "advanced" : 1,
        "needTime" : 23,
        "needYield" : 0,
        "saveState" : 0,
        "restoreState" : 0,
        "isEOF" : 1,
        "direction" : "forward",
        "docsExamined" : 23
    },
    "command" : {
        "find" : "employee",
        "filter" : {
            "emailAddress" : "WLeticia@gmail.com"
        },
        "$db" : "company"
    },
    "serverInfo" : {
        "host" : "DESKTOP-43A64G1",
        "port" : 27017,
        "version" : "4.9.0-rc0",
        "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
    },
    "serverParameters" : {
        "internalQueryFacetBufferSizeBytes" : 104857600,
        "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
        "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
        "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
        "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
        "internalQueryProhibitBlockingMergeOnMongoS" : 0,
        "internalQueryMaxAddToSetBytes" : 104857600,
        "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
    },
    "ok" : 1
}
>

```

```

> db.employee.createIndex({"Address.postalCode":1},{name:"postalCode_index"})
{

```

```

        "numIndexesBefore" : 1,
        "numIndexesAfter" : 2,
        "createdCollectionAutomatically" : false,
        "ok" : 1
    }
>

> db.employee.createIndex({firstName:1, age:-1},{name:"firstname_index"})
{
    "numIndexesBefore" : 2,
    "numIndexesAfter" : 3,
    "createdCollectionAutomatically" : false,
    "ok" : 1
}
>

> db.employee.createIndex({emailAddress:1},{name:"email_index"})
{
    "numIndexesBefore" : 3,
    "numIndexesAfter" : 4,
    "createdCollectionAutomatically" : false,
    "ok" : 1
}
>

> db.employee.getIndexes()
[
    {
        "v" : 2,
        "key" : {
            "_id" : 1
        },
        "name" : "_id_"
    },
    {
        "v" : 2,
        "key" : {
            "Address.postalCode" : 1
        },
        "name" : "postalCode_index"
    },
    {
        "v" : 2,
        "key" : {
            "firstName" : 1,
            "age" : -1
        },
        "name" : "firstname_index"
    },
]

```

```

    {
        "v" : 2,
        "key" : {
            "emailAddress" : 1
        },
        "name" : "email_index"
    }
]
>

*****

>
db.employee.find({"Address.postalCode":1524}).hint("postalCode_index").explain("executionStats")
{
    "explainVersion" : "1",
    "queryPlanner" : {
        "namespace" : "company.employee",
        "indexFilterSet" : false,
        "parsedQuery" : {
            "Address.postalCode" : {
                "$eq" : 1524
            }
        },
        "maxIndexedOrSolutionsReached" : false,
        "maxIndexedAndSolutionsReached" : false,
        "maxScansToExplodeReached" : false,
        "winningPlan" : {
            "stage" : "FETCH",
            "inputStage" : {
                "stage" : "IXSCAN",
                "keyPattern" : {
                    "Address.postalCode" : 1
                },
                "indexName" : "postalCode_index",
                "isMultiKey" : false,
                "multiKeyPaths" : {
                    "Address.postalCode" : [ ]
                },
                "isUnique" : false,
                "isSparse" : false,
                "isPartial" : false,
                "indexVersion" : 2,
                "direction" : "forward",
                "indexBounds" : {
                    "Address.postalCode" : [
                        "[1524.0, 1524.0]"
                    ]
                }
            }
        }
    }
}

```

```

        }
    },
    "rejectedPlans" : [ ]
},
"executionStats" : {
    "executionSuccess" : true,
    "nReturned" : 1,
    "executionTimeMillis" : 40,
    "totalKeysExamined" : 1,
    "totalDocsExamined" : 1,
    "executionStages" : {
        "stage" : "FETCH",
        "nReturned" : 1,
        "executionTimeMillisEstimate" : 30,
        "works" : 2,
        "advanced" : 1,
        "needTime" : 0,
        "needYield" : 0,
        "saveState" : 1,
        "restoreState" : 1,
        "isEOF" : 1,
        "docsExamined" : 1,
        "alreadyHasObj" : 0,
        "inputStage" : {
            "stage" : "IXSCAN",
            "nReturned" : 1,
            "executionTimeMillisEstimate" : 30,
            "works" : 2,
            "advanced" : 1,
            "needTime" : 0,
            "needYield" : 0,
            "saveState" : 1,
            "restoreState" : 1,
            "isEOF" : 1,
            "keyPattern" : {
                "Address.postalCode" : 1
            },
            "indexName" : "postalCode_index",
            "isMultiKey" : false,
            "multiKeyPaths" : {
                "Address.postalCode" : [ ]
            },
            "isUnique" : false,
            "isSparse" : false,
            "isPartial" : false,
            "indexVersion" : 2,
            "direction" : "forward",
            "indexBounds" : {
                "Address.postalCode" : [
                    "[1524.0, 1524.0]"
                ]
            }
        }
    }
}

```

```

        ],
        "keysExamined" : 1,
        "seeks" : 1,
        "dupsTested" : 0,
        "dupsDropped" : 0
    }
}
},
"command" : {
    "find" : "employee",
    "filter" : {
        "Address.postalCode" : 1524
    },
    "hint" : "postalCode_index",
    "$db" : "company"
},
"serverInfo" : {
    "host" : "DESKTOP-43A64G1",
    "port" : 27017,
    "version" : "4.9.0-rc0",
    "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
},
"serverParameters" : {
    "internalQueryFacetBufferSizeBytes" : 104857600,
    "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
    "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
    "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
    "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
    "internalQueryProhibitBlockingMergeOnMongoS" : 0,
    "internalQueryMaxAddToSetBytes" : 104857600,
    "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
},
"ok" : 1
}
>

```

```

>
db.employee.find({"firstName":"Kathlyn"}).hint("firstname_index").explain("execution
Stats")
{
    "explainVersion" : "1",
    "queryPlanner" : {
        "namespace" : "company.employee",
        "indexFilterSet" : false,
        "parsedQuery" : {
            "firstName" : {
                "$eq" : "Kathlyn"
            }
        }
    }
}

```

```

        }
    },
    "maxIndexedOrSolutionsReached" : false,
    "maxIndexedAndSolutionsReached" : false,
    "maxScansToExplodeReached" : false,
    "winningPlan" : {
        "stage" : "FETCH",
        "inputStage" : {
            "stage" : "IXSCAN",
            "keyPattern" : {
                "firstName" : 1,
                "age" : -1
            },
            "indexName" : "firstname_index",
            "isMultiKey" : false,
            "multiKeyPaths" : {
                "firstName" : [ ],
                "age" : [ ]
            },
            "isUnique" : false,
            "isSparse" : false,
            "isPartial" : false,
            "indexVersion" : 2,
            "direction" : "forward",
            "indexBounds" : {
                "firstName" : [
                    "["Kathlyn\"", "\"Kathlyn\""
                ],
                "age" : [
                    "[MaxKey, MinKey]"
                ]
            }
        }
    },
    "rejectedPlans" : [ ]
},
"executionStats" : {
    "executionSuccess" : true,
    "nReturned" : 1,
    "executionTimeMillis" : 31,
    "totalKeysExamined" : 1,
    "totalDocsExamined" : 1,
    "executionStages" : {
        "stage" : "FETCH",
        "nReturned" : 1,
        "executionTimeMillisEstimate" : 32,
        "works" : 2,
        "advanced" : 1,
        "needTime" : 0,
        "needYield" : 0,

```

```

        "saveState" : 1,
        "restoreState" : 1,
        "isEOF" : 1,
        "docsExamined" : 1,
        "alreadyHasObj" : 0,
        "inputStage" : {
            "stage" : "IXSCAN",
            "nReturned" : 1,
            "executionTimeMillisEstimate" : 32,
            "works" : 2,
            "advanced" : 1,
            "needTime" : 0,
            "needYield" : 0,
            "saveState" : 1,
            "restoreState" : 1,
            "isEOF" : 1,
            "keyPattern" : {
                "firstName" : 1,
                "age" : -1
            },
            "indexName" : "firstname_index",
            "isMultiKey" : false,
            "multiKeyPaths" : {
                "firstName" : [ ],
                "age" : [ ]
            },
            "isUnique" : false,
            "isSparse" : false,
            "isPartial" : false,
            "indexVersion" : 2,
            "direction" : "forward",
            "indexBounds" : {
                "firstName" : [
                    "["Kathlyn\"", "\"Kathlyn\""
                ],
                "age" : [
                    "[MaxKey, MinKey]"
                ]
            },
            "keysExamined" : 1,
            "seeks" : 1,
            "dupsTested" : 0,
            "dupsDropped" : 0
        }
    },
    "command" : {
        "find" : "employee",
        "filter" : {
            "firstName" : "Kathlyn"
        }
    }
}

```



```

    },
    "hint" : "firstname_index",
    "$db" : "company"
  },
  "serverInfo" : {
    "host" : "DESKTOP-43A64G1",
    "port" : 27017,
    "version" : "4.9.0-rc0",
    "gitVersion" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
  },
  "serverParameters" : {
    "internalQueryFacetBufferSizeBytes" : 104857600,
    "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
    "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
    "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
    "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
    "internalQueryProhibitBlockingMergeOnMongoS" : 0,
    "internalQueryMaxAddToSetBytes" : 104857600,
    "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
  },
  "ok" : 1
}
>

*****

>
db.employee.find({"emailAddress":"WLeticia@gmail.com"}).hint("email_index").explain(
"executionStats")
{
  "explainVersion" : "1",
  "queryPlanner" : {
    "namespace" : "company.employee",
    "indexFilterSet" : false,
    "parsedQuery" : {
      "emailAddress" : {
        "$eq" : "WLeticia@gmail.com"
      }
    },
    "maxIndexedOrSolutionsReached" : false,
    "maxIndexedAndSolutionsReached" : false,
    "maxScansToExplodeReached" : false,
    "winningPlan" : {
      "stage" : "FETCH",
      "inputStage" : {
        "stage" : "IXSCAN",
        "keyPattern" : {
          "emailAddress" : 1
        },
        "indexName" : "email_index",

```

```

        "isMultiKey" : true,
        "multiKeyPaths" : {
            "emailAddress" : [
                "emailAddress"
            ]
        },
        "isUnique" : false,
        "isSparse" : false,
        "isPartial" : false,
        "indexVersion" : 2,
        "direction" : "forward",
        "indexBounds" : {
            "emailAddress" : [
                "[\"WLeticia@gmail.com\"]",
                "[\"WLeticia@gmail.com\"]"
            ]
        }
    },
    "rejectedPlans" : [ ]
},
"executionStats" : {
    "executionSuccess" : true,
    "nReturned" : 1,
    "executionTimeMillis" : 16,
    "totalKeysExamined" : 1,
    "totalDocsExamined" : 1,
    "executionStages" : {
        "stage" : "FETCH",
        "nReturned" : 1,
        "executionTimeMillisEstimate" : 11,
        "works" : 2,
        "advanced" : 1,
        "needTime" : 0,
        "needYield" : 0,
        "saveState" : 1,
        "restoreState" : 1,
        "isEOF" : 1,
        "docsExamined" : 1,
        "alreadyHasObj" : 0,
        "inputStage" : {
            "stage" : "IXSCAN",
            "nReturned" : 1,
            "executionTimeMillisEstimate" : 11,
            "works" : 2,
            "advanced" : 1,
            "needTime" : 0,
            "needYield" : 0,
            "saveState" : 1,
            "restoreState" : 1,

```

```

        "isEOF" : 1,
        "keyPattern" : {
            "emailAddress" : 1
        },
        "indexName" : "email_index",
        "isMultiKey" : true,
        "multiKeyPaths" : {
            "emailAddress" : [
                "emailAddress"
            ]
        },
        "isUnique" : false,
        "isSparse" : false,
        "isPartial" : false,
        "indexVersion" : 2,
        "direction" : "forward",
        "indexBounds" : {
            "emailAddress" : [
                "[\"WLeticia@gmail.com\"]"
            ]
        },
        "keysExamined" : 1,
        "seeks" : 1,
        "dupsTested" : 1,
        "dupsDropped" : 0
    }
},
"command" : {
    "find" : "employee",
    "filter" : {
        "emailAddress" : "WLeticia@gmail.com"
    },
    "hint" : "email_index",
    "$db" : "company"
},
"serverInfo" : {
    "host" : "DESKTOP-43A64G1",
    "port" : 27017,
    "version" : "4.9.0-rc0",
    "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
},
"serverParameters" : {
    "internalQueryFacetBufferSizeBytes" : 104857600,
    "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
    "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
    "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
    "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
    "internalQueryProhibitBlockingMergeOnMongoS" : 0,

```

```
        "internalQueryMaxAddToSetBytes" : 104857600,  
        "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600  
    },  
    "ok" : 1  
}  
>
```

```

1
2 Indexes
3
4 *****
5
6 C:\Users\kalar>mongoimport --db=company --collection=book --file=F:\T9\BDA\books.json
7 2021-04-26T00:05:23.163+0530    connected to: mongod://localhost/
8 2021-04-26T00:05:23.298+0530    431 document(s) imported successfully. 0 document(s)
   failed to import.
9
10 *****
11
12 > use company
13 switched to db company
14 > show collections
15 book
16 employee
17 >
18 > db.book.find().pretty().limit(2)
19 {
20     "_id" : 3,
21     "title" : "Specification by Example",
22     "isbn" : "1617290084",
23     "pageCount" : 0,
24     "publishedDate" : ISODate("2011-06-03T07:00:00Z"),
25     "thumbnailUrl" :
26     "https://s3.amazonaws.com/AKIAJC5RLADLUMVRPFDQ.book-thumb-images/adzic.jpg",
27     "status" : "PUBLISH",
28     "authors" : [
29         "Gojko Adzic"
30     ],
31     "categories" : [
32         "Software Engineering"
33     ]
34 }
35 {
36     "_id" : 8,
37     "title" : "Flex on Java",
38     "isbn" : "1933988797",
39     "pageCount" : 265,
40     "publishedDate" : ISODate("2010-10-15T07:00:00Z"),
41     "thumbnailUrl" :
42     "https://s3.amazonaws.com/AKIAJC5RLADLUMVRPFDQ.book-thumb-images/allmon.jpg",
43     "shortDescription" : "    A beautifully written book that is a must have for
   every Java Developer.    Ashish Kulkarni, Technical Director, E-Business
   Software Solutions Ltd.",
44     "longDescription" : "In the demo, a hip designer, a sharply-dressed marketer,
   and a smiling, relaxed developer sip lattes and calmly discuss how Flex is
   going to make customers happy and shorten the workday    all while boosting the
   bottom line. The software systems they're using have been carefully selected
   and built from the ground up to work together seamlessly. There are no legacy
   systems, data, or competing business concerns to manage.    Cut to reality.
   You're a Java developer. The marketing guy tells you that \"corporate\" wants a
   Flex-based site and you have to deliver it on top of what you already have.
   Your budget    Don't even ask. \"Make it look like the Discovery channel or
   something.\"    Flex on Java assumes you live in the real world    not the demo.
   This unique book shows you how to refactor an existing web application using
   the server-side you already know. You'll learn to use Flex 3 in concert with
   Spring, EJB 3, POJOs, JMS, and other standard technologies. Wherever possible,
   the examples use free or open source software.    The authors start with a
   typical Java web app and show you how to add a rich Flex interface. You also
   learn how to integrate Flex into your server-side Java via the BlazeDS
   framework, Adobe's open-source remoting and web messaging technology for
   Flex.    The book shows you how to deploy to not only the web but also to the
   desktop using the Adobe Integrated Runtime (AIR). You will learn how to
   integrate Flex into your existing applications in order to build a next
   generation application that will delight users.    Flex on Java is approachable
   for anyone beginning Java and Flex development.    ",
45     "status" : "PUBLISH",

```

```

44     "authors" : [
45         "Bernerd Allmon",
46         "Jeremy Anderson"
47     ],
48     "categories" : [
49         "Internet"
50     ]
51 }
52 > db.book.count()
53 431
54 >
55
56 > db.book.getIndexes()
57 [ { "v" : 2, "key" : { "_id" : 1 }, "name" : "_id_" } ]
58 >
59
60 *****
61
62 > db.book.find({"isbn":1933988495}).explain()
63 {
64     "explainVersion" : "1",
65     "queryPlanner" : {
66         "namespace" : "company.book",
67         "indexFilterSet" : false,
68         "parsedQuery" : {
69             "isbn" : {
70                 "$eq" : 1933988495
71             }
72         },
73         "queryHash" : "6966B058",
74         "planCacheKey" : "6966B058",
75         "maxIndexedOrSolutionsReached" : false,
76         "maxIndexedAndSolutionsReached" : false,
77         "maxScansToExplodeReached" : false,
78         "winningPlan" : {
79             "stage" : "COLLSCAN",
80             "filter" : {
81                 "isbn" : {
82                     "$eq" : 1933988495
83                 }
84             },
85             "direction" : "forward"
86         },
87         "rejectedPlans" : [ ]
88     },
89     "command" : {
90         "find" : "book",
91         "filter" : {
92             "isbn" : 1933988495
93         },
94         "$db" : "company"
95     },
96     "serverInfo" : {
97         "host" : "DESKTOP-43A64G1",
98         "port" : 27017,
99         "version" : "4.9.0-rc0",
100        "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
101    },
102    "serverParameters" : {
103        "internalQueryFacetBufferSizeBytes" : 104857600,
104        "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
105        "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
106        "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
107        "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
108        "internalQueryProhibitBlockingMergeOnMongoS" : 0,
109        "internalQueryMaxAddToSetBytes" : 104857600,
110        "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
111    },
112    "ok" : 1

```

```

113 }
114 >
115
116 > db.book.find({"isbn":1933988495}).explain("executionStats")
117 {
118     "explainVersion" : "1",
119     "queryPlanner" : {
120         "namespace" : "company.book",
121         "indexFilterSet" : false,
122         "parsedQuery" : {
123             "isbn" : {
124                 "$eq" : 1933988495
125             }
126         },
127         "maxIndexedOrSolutionsReached" : false,
128         "maxIndexedAndSolutionsReached" : false,
129         "maxScansToExplodeReached" : false,
130         "winningPlan" : {
131             "stage" : "COLLSCAN",
132             "filter" : {
133                 "isbn" : {
134                     "$eq" : 1933988495
135                 }
136             },
137             "direction" : "forward"
138         },
139         "rejectedPlans" : [ ]
140     },
141     "executionStats" : {
142         "executionSuccess" : true,
143         "nReturned" : 0,
144         "executionTimeMillis" : 0,
145         "totalKeysExamined" : 0,
146         "totalDocsExamined" : 431,
147         "executionStages" : {
148             "stage" : "COLLSCAN",
149             "filter" : {
150                 "isbn" : {
151                     "$eq" : 1933988495
152                 }
153             },
154             "nReturned" : 0,
155             "executionTimeMillisEstimate" : 0,
156             "works" : 433,
157             "advanced" : 0,
158             "needTime" : 432,
159             "needYield" : 0,
160             "saveState" : 0,
161             "restoreState" : 0,
162             "isEOF" : 1,
163             "direction" : "forward",
164             "docsExamined" : 431
165         }
166     },
167     "command" : {
168         "find" : "book",
169         "filter" : {
170             "isbn" : 1933988495
171         },
172         "$db" : "company"
173     },
174     "serverInfo" : {
175         "host" : "DESKTOP-43A64G1",
176         "port" : 27017,
177         "version" : "4.9.0-rc0",
178         "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
179     },
180     "serverParameters" : {
181         "internalQueryFacetBufferSizeBytes" : 104857600,

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182         "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
183         "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
184         "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
185         "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
186         "internalQueryProhibitBlockingMergeOnMongoS" : 0,
187         "internalQueryMaxAddToSetBytes" : 104857600,
188         "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
189     },
190     "ok" : 1
191 }
192 >
193
194 *****
195
196 > db.book.find({"isbn":1933988495}).explain("executionStats")
197 {
198     "explainVersion" : "1",
199     "queryPlanner" : {
200         "namespace" : "company.book",
201         "indexFilterSet" : false,
202         "parsedQuery" : {
203             "isbn" : {
204                 "$eq" : 1933988495
205             }
206         },
207         "maxIndexedOrSolutionsReached" : false,
208         "maxIndexedAndSolutionsReached" : false,
209         "maxScansToExplodeReached" : false,
210         "winningPlan" : {
211             "stage" : "COLLSCAN",
212             "filter" : {
213                 "isbn" : {
214                     "$eq" : 1933988495
215                 }
216             },
217             "direction" : "forward"
218         },
219         "rejectedPlans" : [ ]
220     },
221     "executionStats" : {
222         "executionSuccess" : true,
223         "nReturned" : 0,
224         "executionTimeMillis" : 0,
225         "totalKeysExamined" : 0,
226         "totalDocsExamined" : 431,
227         "executionStages" : {
228             "stage" : "COLLSCAN",
229             "filter" : {
230                 "isbn" : {
231                     "$eq" : 1933988495
232                 }
233             },
234             "nReturned" : 0,
235             "executionTimeMillisEstimate" : 0,
236             "works" : 433,
237             "advanced" : 0,
238             "needTime" : 432,
239             "needYield" : 0,
240             "saveState" : 0,
241             "restoreState" : 0,
242             "isEOF" : 1,
243             "direction" : "forward",
244             "docsExamined" : 431
245         }
246     },
247     "command" : {
248         "find" : "book",
249         "filter" : {
250             "isbn" : 1933988495

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```

251         },
252         "$db" : "company"
253     },
254     "serverInfo" : {
255         "host" : "DESKTOP-43A64G1",
256         "port" : 27017,
257         "version" : "4.9.0-rc0",
258         "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
259     },
260     "serverParameters" : {
261         "internalQueryFacetBufferSizeBytes" : 104857600,
262         "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
263         "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
264         "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
265         "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
266         "internalQueryProhibitBlockingMergeOnMongoS" : 0,
267         "internalQueryMaxAddToSetBytes" : 104857600,
268         "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
269     },
270     "ok" : 1
271 }
272 >
273 >
274
275 *****
276
277 > db.book.find({"title":"ASP.NET MVC in Action"}).explain("executionStats")
278 {
279     "explainVersion" : "1",
280     "queryPlanner" : {
281         "namespace" : "company.book",
282         "indexFilterSet" : false,
283         "parsedQuery" : {
284             "title" : {
285                 "$eq" : "ASP.NET MVC in Action"
286             }
287         },
288         "maxIndexedOrSolutionsReached" : false,
289         "maxIndexedAndSolutionsReached" : false,
290         "maxScansToExplodeReached" : false,
291         "winningPlan" : {
292             "stage" : "COLLSCAN",
293             "filter" : {
294                 "title" : {
295                     "$eq" : "ASP.NET MVC in Action"
296                 }
297             },
298             "direction" : "forward"
299         },
300         "rejectedPlans" : [ ]
301     },
302     "executionStats" : {
303         "executionSuccess" : true,
304         "nReturned" : 1,
305         "executionTimeMillis" : 0,
306         "totalKeysExamined" : 0,
307         "totalDocsExamined" : 431,
308         "executionStages" : {
309             "stage" : "COLLSCAN",
310             "filter" : {
311                 "title" : {
312                     "$eq" : "ASP.NET MVC in Action"
313                 }
314             },
315             "nReturned" : 1,
316             "executionTimeMillisEstimate" : 0,
317             "works" : 433,
318             "advanced" : 1,
319             "needTime" : 431,

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320         "needYield" : 0,
321         "saveState" : 0,
322         "restoreState" : 0,
323         "isEOF" : 1,
324         "direction" : "forward",
325         "docsExamined" : 431
326     }
327 },
328 "command" : {
329     "find" : "book",
330     "filter" : {
331         "title" : "ASP.NET MVC in Action"
332     },
333     "$db" : "company"
334 },
335 "serverInfo" : {
336     "host" : "DESKTOP-43A64G1",
337     "port" : 27017,
338     "version" : "4.9.0-rc0",
339     "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
340 },
341 "serverParameters" : {
342     "internalQueryFacetBufferSizeBytes" : 104857600,
343     "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
344     "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
345     "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
346     "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
347     "internalQueryProhibitBlockingMergeOnMongoS" : 0,
348     "internalQueryMaxAddToSetBytes" : 104857600,
349     "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
350 },
351 "ok" : 1
352 }
353 >
354
355 *****
356 > db.book.find({"categories":"Microsoft .NET"}).explain("executionStats")
357 {
358     "explainVersion" : "1",
359     "queryPlanner" : {
360         "namespace" : "company.book",
361         "indexFilterSet" : false,
362         "parsedQuery" : {
363             "categories" : {
364                 "$eq" : "Microsoft .NET"
365             }
366         },
367         "maxIndexedOrSolutionsReached" : false,
368         "maxIndexedAndSolutionsReached" : false,
369         "maxScansToExplodeReached" : false,
370         "winningPlan" : {
371             "stage" : "COLLSCAN",
372             "filter" : {
373                 "categories" : {
374                     "$eq" : "Microsoft .NET"
375                 }
376             },
377             "direction" : "forward"
378         },
379         "rejectedPlans" : [ ]
380     },
381     "executionStats" : {
382         "executionSuccess" : true,
383         "nReturned" : 34,
384         "executionTimeMillis" : 1,
385         "totalKeysExamined" : 0,
386         "totalDocsExamined" : 431,
387         "executionStages" : {
388             "stage" : "COLLSCAN",

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```

389         "filter" : {
390             "categories" : {
391                 "$eq" : "Microsoft .NET"
392             }
393         },
394         "nReturned" : 34,
395         "executionTimeMillisEstimate" : 0,
396         "works" : 433,
397         "advanced" : 34,
398         "needTime" : 398,
399         "needYield" : 0,
400         "saveState" : 0,
401         "restoreState" : 0,
402         "isEOF" : 1,
403         "direction" : "forward",
404         "docsExamined" : 431
405     }
406 },
407 "command" : {
408     "find" : "book",
409     "filter" : {
410         "categories" : "Microsoft .NET"
411     },
412     "$db" : "company"
413 },
414 "serverInfo" : {
415     "host" : "DESKTOP-43A64G1",
416     "port" : 27017,
417     "version" : "4.9.0-rc0",
418     "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
419 },
420 "serverParameters" : {
421     "internalQueryFacetBufferSizeBytes" : 104857600,
422     "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
423     "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
424     "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
425     "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
426     "internalQueryProhibitBlockingMergeOnMongoS" : 0,
427     "internalQueryMaxAddToSetBytes" : 104857600,
428     "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
429 },
430 "ok" : 1
431 }
432 >
433
434 *****
435 *****
436 Single Field Index
437
438 > db.book.createIndex({"isbn":1},{name:"isbn_index"})
439 {
440     "numIndexesBefore" : 1,
441     "numIndexesAfter" : 2,
442     "createdCollectionAutomatically" : false,
443     "ok" : 1
444 }
445
446
447 Compound Field Index
448
449 > db.book.createIndex({"title":1, publisedDate:-1},{name:"title_index"})
450 {
451     "numIndexesBefore" : 2,
452     "numIndexesAfter" : 3,
453     "createdCollectionAutomatically" : false,
454     "ok" : 1
455 }
456
457

```

```

458 Multikey Index
459
460 > db.book.createIndex({"categories":1},{name:"categories_index"})
461 {
462     "numIndexesBefore" : 3,
463     "numIndexesAfter" : 4,
464     "createdCollectionAutomatically" : false,
465     "ok" : 1
466 }
467 >
468 >
469
470 *****
471 *****
472
473 > db.book.getIndexes()
474 [
475     {
476         "v" : 2,
477         "key" : {
478             "_id" : 1
479         },
480         "name" : "_id_"
481     },
482     {
483         "v" : 2,
484         "key" : {
485             "isbn" : 1
486         },
487         "name" : "isbn_index"
488     },
489     {
490         "v" : 2,
491         "key" : {
492             "title" : 1,
493             "publisedDate" : -1
494         },
495         "name" : "title_index"
496     },
497     {
498         "v" : 2,
499         "key" : {
500             "categories" : 1
501         },
502         "name" : "categories_index"
503     }
504 ]
505 >
506
507 *****
508
509 > db.book.find({"isbn":1933988495}).hint("isbn_index").explain("executionStats")
510 {
511     "explainVersion" : "1",
512     "queryPlanner" : {
513         "namespace" : "company.book",
514         "indexFilterSet" : false,
515         "parsedQuery" : {
516             "isbn" : {
517                 "$eq" : 1933988495
518             }
519         },
520         "maxIndexedOrSolutionsReached" : false,
521         "maxIndexedAndSolutionsReached" : false,
522         "maxScansToExplodeReached" : false,
523         "winningPlan" : {
524             "stage" : "FETCH",
525             "inputStage" : {
526                 "stage" : "IXSCAN",

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527         "keyPattern" : {
528             "isbn" : 1
529         },
530         "indexName" : "isbn_index",
531         "isMultiKey" : false,
532         "multiKeyPaths" : {
533             "isbn" : [ ]
534         },
535         "isUnique" : false,
536         "isSparse" : false,
537         "isPartial" : false,
538         "indexVersion" : 2,
539         "direction" : "forward",
540         "indexBounds" : {
541             "isbn" : [
542                 "[1933988495.0, 1933988495.0]"
543             ]
544         }
545     },
546     },
547     "rejectedPlans" : [ ]
548 },
549 "executionStats" : {
550     "executionSuccess" : true,
551     "nReturned" : 0,
552     "executionTimeMillis" : 33,
553     "totalKeysExamined" : 0,
554     "totalDocsExamined" : 0,
555     "executionStages" : {
556         "stage" : "FETCH",
557         "nReturned" : 0,
558         "executionTimeMillisEstimate" : 34,
559         "works" : 1,
560         "advanced" : 0,
561         "needTime" : 0,
562         "needYield" : 0,
563         "saveState" : 0,
564         "restoreState" : 0,
565         "isEOF" : 1,
566         "docsExamined" : 0,
567         "alreadyHasObj" : 0,
568         "inputStage" : {
569             "stage" : "IXSCAN",
570             "nReturned" : 0,
571             "executionTimeMillisEstimate" : 34,
572             "works" : 1,
573             "advanced" : 0,
574             "needTime" : 0,
575             "needYield" : 0,
576             "saveState" : 0,
577             "restoreState" : 0,
578             "isEOF" : 1,
579             "keyPattern" : {
580                 "isbn" : 1
581             },
582             "indexName" : "isbn_index",
583             "isMultiKey" : false,
584             "multiKeyPaths" : {
585                 "isbn" : [ ]
586             },
587             "isUnique" : false,
588             "isSparse" : false,
589             "isPartial" : false,
590             "indexVersion" : 2,
591             "direction" : "forward",
592             "indexBounds" : {
593                 "isbn" : [
594                     "[1933988495.0, 1933988495.0]"
595                 ]

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596         },
597         "keysExamined" : 0,
598         "seeks" : 1,
599         "dupsTested" : 0,
600         "dupsDropped" : 0
601     }
602 }
603 },
604 "command" : {
605     "find" : "book",
606     "filter" : {
607         "isbn" : 1933988495
608     },
609     "hint" : "isbn_index",
610     "$db" : "company"
611 },
612 "serverInfo" : {
613     "host" : "DESKTOP-43A64G1",
614     "port" : 27017,
615     "version" : "4.9.0-rc0",
616     "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
617 },
618 "serverParameters" : {
619     "internalQueryFacetBufferSizeBytes" : 104857600,
620     "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
621     "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
622     "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
623     "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
624     "internalQueryProhibitBlockingMergeOnMongoS" : 0,
625     "internalQueryMaxAddToSetBytes" : 104857600,
626     "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
627 },
628 "ok" : 1
629 }
630 >
631
632 *****
633
634 > db.book.find({"title":"ASP.NET MVC in
Action"}).hint("title_index").explain("executionStats")
635 {
636     "explainVersion" : "1",
637     "queryPlanner" : {
638         "namespace" : "company.book",
639         "indexFilterSet" : false,
640         "parsedQuery" : {
641             "title" : {
642                 "$eq" : "ASP.NET MVC in Action"
643             }
644         },
645         "maxIndexedOrSolutionsReached" : false,
646         "maxIndexedAndSolutionsReached" : false,
647         "maxScansToExplodeReached" : false,
648         "winningPlan" : {
649             "stage" : "FETCH",
650             "inputStage" : {
651                 "stage" : "IXSCAN",
652                 "keyPattern" : {
653                     "title" : 1,
654                     "publisedDate" : -1
655                 },
656                 "indexName" : "title_index",
657                 "isMultiKey" : false,
658                 "multiKeyPaths" : {
659                     "title" : [ ],
660                     "publisedDate" : [ ]
661                 },
662                 "isUnique" : false,
663                 "isSparse" : false,

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664         "isPartial" : false,
665         "indexVersion" : 2,
666         "direction" : "forward",
667         "indexBounds" : {
668             "title" : [
669                 ["ASP.NET MVC in Action\\", \\ASP.NET
670                     MVC in Action\\"]
671             ],
672             "publisedDate" : [
673                 ["MaxKey, MinKey"]
674             ]
675         }
676     },
677     "rejectedPlans" : [ ]
678 },
679 "executionStats" : {
680     "executionSuccess" : true,
681     "nReturned" : 1,
682     "executionTimeMillis" : 14,
683     "totalKeysExamined" : 1,
684     "totalDocsExamined" : 1,
685     "executionStages" : {
686         "stage" : "FETCH",
687         "nReturned" : 1,
688         "executionTimeMillisEstimate" : 10,
689         "works" : 2,
690         "advanced" : 1,
691         "needTime" : 0,
692         "needYield" : 0,
693         "saveState" : 0,
694         "restoreState" : 0,
695         "isEOF" : 1,
696         "docsExamined" : 1,
697         "alreadyHasObj" : 0,
698         "inputStage" : {
699             "stage" : "IXSCAN",
700             "nReturned" : 1,
701             "executionTimeMillisEstimate" : 10,
702             "works" : 2,
703             "advanced" : 1,
704             "needTime" : 0,
705             "needYield" : 0,
706             "saveState" : 0,
707             "restoreState" : 0,
708             "isEOF" : 1,
709             "keyPattern" : {
710                 "title" : 1,
711                 "publisedDate" : -1
712             },
713             "indexName" : "title_index",
714             "isMultiKey" : false,
715             "multiKeyPaths" : {
716                 "title" : [ ],
717                 "publisedDate" : [ ]
718             },
719             "isUnique" : false,
720             "isSparse" : false,
721             "isPartial" : false,
722             "indexVersion" : 2,
723             "direction" : "forward",
724             "indexBounds" : {
725                 "title" : [
726                     ["ASP.NET MVC in Action\\", \\ASP.NET
727                         MVC in Action\\"]
728                 ],
729                 "publisedDate" : [
730                     ["MaxKey, MinKey"]

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731         },
732         "keysExamined" : 1,
733         "seeks" : 1,
734         "dupsTested" : 0,
735         "dupsDropped" : 0
736     }
737 }
738 },
739 "command" : {
740     "find" : "book",
741     "filter" : {
742         "title" : "ASP.NET MVC in Action"
743     },
744     "hint" : "title_index",
745     "$db" : "company"
746 },
747 "serverInfo" : {
748     "host" : "DESKTOP-43A64G1",
749     "port" : 27017,
750     "version" : "4.9.0-rc0",
751     "gitVersion" : "64540ae7bb8b4298c780ecc154f866dddbc8d676c"
752 },
753 "serverParameters" : {
754     "internalQueryFacetBufferSizeBytes" : 104857600,
755     "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
756     "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
757     "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
758     "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
759     "internalQueryProhibitBlockingMergeOnMongoS" : 0,
760     "internalQueryMaxAddToSetBytes" : 104857600,
761     "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
762 },
763 "ok" : 1
764 }
765 >
766
767 *****
768 > db.book.find({"categories":"Microsoft
.NET"}).hint("categories_index").explain("executionStats")
769 {
770     "explainVersion" : "1",
771     "queryPlanner" : {
772         "namespace" : "company.book",
773         "indexFilterSet" : false,
774         "parsedQuery" : {
775             "categories" : {
776                 "$eq" : "Microsoft .NET"
777             }
778         },
779         "maxIndexedOrSolutionsReached" : false,
780         "maxIndexedAndSolutionsReached" : false,
781         "maxScansToExplodeReached" : false,
782         "winningPlan" : {
783             "stage" : "FETCH",
784             "inputStage" : {
785                 "stage" : "IXSCAN",
786                 "keyPattern" : {
787                     "categories" : 1
788                 },
789                 "indexName" : "categories_index",
790                 "isMultiKey" : true,
791                 "multiKeyPaths" : {
792                     "categories" : [
793                         "categories"
794                     ]
795                 },
796                 "isUnique" : false,
797                 "isSparse" : false,
798                 "isPartial" : false,

```



```

799         "indexVersion" : 2,
800         "direction" : "forward",
801         "indexBounds" : {
802             "categories" : [
803                 "[\"Microsoft .NET\", \"Microsoft
.NET\"]"
804             ]
805         }
806     },
807     },
808     "rejectedPlans" : [ ]
809 },
810 "executionStats" : {
811     "executionSuccess" : true,
812     "nReturned" : 34,
813     "executionTimeMillis" : 16,
814     "totalKeysExamined" : 34,
815     "totalDocsExamined" : 34,
816     "executionStages" : {
817         "stage" : "FETCH",
818         "nReturned" : 34,
819         "executionTimeMillisEstimate" : 11,
820         "works" : 35,
821         "advanced" : 34,
822         "needTime" : 0,
823         "needYield" : 0,
824         "saveState" : 1,
825         "restoreState" : 1,
826         "isEOF" : 1,
827         "docsExamined" : 34,
828         "alreadyHasObj" : 0,
829         "inputStage" : {
830             "stage" : "IXSCAN",
831             "nReturned" : 34,
832             "executionTimeMillisEstimate" : 11,
833             "works" : 35,
834             "advanced" : 34,
835             "needTime" : 0,
836             "needYield" : 0,
837             "saveState" : 1,
838             "restoreState" : 1,
839             "isEOF" : 1,
840             "keyPattern" : {
841                 "categories" : 1
842             },
843             "indexName" : "categories_index",
844             "isMultiKey" : true,
845             "multiKeyPaths" : {
846                 "categories" : [
847                     "categories"
848                 ]
849             },
850             "isUnique" : false,
851             "isSparse" : false,
852             "isPartial" : false,
853             "indexVersion" : 2,
854             "direction" : "forward",
855             "indexBounds" : {
856                 "categories" : [
857                     "[\"Microsoft .NET\", \"Microsoft
.NET\"]"
858                 ]
859             },
860             "keysExamined" : 34,
861             "seeks" : 1,
862             "dupsTested" : 34,
863             "dupsDropped" : 0
864         }
865     }

```

```
866 },
867 "command" : {
868     "find" : "book",
869     "filter" : {
870         "categories" : "Microsoft .NET"
871     },
872     "hint" : "categories_index",
873     "$db" : "company"
874 },
875 "serverInfo" : {
876     "host" : "DESKTOP-43A64G1",
877     "port" : 27017,
878     "version" : "4.9.0-rc0",
879     "gitVersion" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
880 },
881 "serverParameters" : {
882     "internalQueryFacetBufferSizeBytes" : 104857600,
883     "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
884     "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
885     "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
886     "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
887     "internalQueryProhibitBlockingMergeOnMongoS" : 0,
888     "internalQueryMaxAddToSetBytes" : 104857600,
889     "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
890 },
891 "ok" : 1
892 }
893 >
```