```
     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: mongodb://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" :
                   "https://s3.amazonaws.com/AKIAJC5RLADLUMVRPFDQ.book-thumb-images/adzic.jpg",
    26             "status" : "PUBLISH",
    27             "authors" : [
    28                     "Gojko Adzic"
    29             ],
    30             "categories" : [
    31                     "Software Engineering"
    32             ]
    33     }
    34     {
    35             "_id" : 8,
    36             "title" : "Flex on Java",
    37             "isbn" : "1933988797",
    38             "pageCount" : 265,
    39             "publishedDate" : ISODate("2010-10-15T07:00:00Z"),
    40             "thumbnailUrl" :
                   "https://s3.amazonaws.com/AKIAJC5RLADLUMVRPFDQ.book-thumb-images/allmon.jpg",
    41             "shortDescription" : "   A beautifully written book that is a must have for
                   every Java Developer.      Ashish Kulkarni, Technical Director, E-Business
                   Software Solutions Ltd.",
    42             "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.   ",
    43             "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" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
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" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
179            },
180            "serverParameters" : {
181                    "internalQueryFacetBufferSizeBytes" : 104857600,
```

```
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
```

```
251                         },
252                         "$db" : "company"
253                 },
254                 "serverInfo" : {
255                         "host" : "DESKTOP-43A64G1",
256                         "port" : 27017,
257                         "version" : "4.9.0-rc0",
258                         "gitVersion" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
259                 },
260                 "serverParameters" : {
261                         "internalQueryFacetBufferSizeBytes" : 104857600,
262                         "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
263                         "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
264                         "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
265                         "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
266                         "internalQueryProhibitBlockingMergeOnMongoS" : 0,
267                         "internalQueryMaxAddToSetBytes" : 104857600,
268                         "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
269                 },
270                 "ok" : 1
271 }
272 >
273 >
274
275 ********************************************************************
276
277 > db.book.find({"title":"ASP.NET MVC in Action"}).explain("executionStats")
278 {
279         "explainVersion" : "1",
280         "queryPlanner" : {
281                 "namespace" : "company.book",
282                 "indexFilterSet" : false,
283                 "parsedQuery" : {
284                         "title" : {
285                                 "$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,
```

```
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                     "$db" : "company"
334             },
335             "serverInfo" : {
336                     "host" : "DESKTOP-43A64G1",
337                     "port" : 27017,
338                     "version" : "4.9.0-rc0",
339                     "gitVersion" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
340             },
341             "serverParameters" : {
342                     "internalQueryFacetBufferSizeBytes" : 104857600,
343                     "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
344                     "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
345                     "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
346                     "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
347                     "internalQueryProhibitBlockingMergeOnMongoS" : 0,
348                     "internalQueryMaxAddToSetBytes" : 104857600,
349                     "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
350             },
351             "ok" : 1
352 }
353 >
354
355 **********************************************************************
356 > db.book.find({"categories":"Microsoft .NET"}).explain("executionStats")
357 {
358         "explainVersion" : "1",
359         "queryPlanner" : {
360                 "namespace" : "company.book",
361                 "indexFilterSet" : false,
362                 "parsedQuery" : {
363                         "categories" : {
364                                 "$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",
```

```
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" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
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",
```

```
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                                    ]
```

```
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                         "$db" : "company"
611                 },
612                 "serverInfo" : {
613                         "host" : "DESKTOP-43A64G1",
614                         "port" : 27017,
615                         "version" : "4.9.0-rc0",
616                         "gitVersion" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
617                 },
618                 "serverParameters" : {
619                         "internalQueryFacetBufferSizeBytes" : 104857600,
620                         "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
621                         "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
622                         "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
623                         "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
624                         "internalQueryProhibitBlockingMergeOnMongoS" : 0,
625                         "internalQueryMaxAddToSetBytes" : 104857600,
626                         "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
627                 },
628                 "ok" : 1
629 }
630 >
631
632 ********************************************************************
633
634 > db.book.find({"title":"ASP.NET MVC in
    Action"}).hint("title_index").explain("executionStats")
635 {
636         "explainVersion" : "1",
637         "queryPlanner" : {
638                 "namespace" : "company.book",
639                 "indexFilterSet" : false,
640                 "parsedQuery" : {
641                         "title" : {
642                                 "$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,
```

```
664                                            "isPartial" : false,
665                                            "indexVersion" : 2,
666                                            "direction" : "forward",
667                                            "indexBounds" : {
668                                                    "title" : [
669                                                            "[\"ASP.NET MVC in Action\", \"ASP.NET
                                                             MVC in Action\"]"
670                                                    ],
671                                                    "publisedDate" : [
672                                                            "[MaxKey, MinKey]"
673                                                    ]
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
                                                     MVC in Action\"]"
727                                            ],
728                                            "publisedDate" : [
729                                                    "[MaxKey, MinKey]"
730                                            ]
```

```
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                  "$db" : "company"
746          },
747          "serverInfo" : {
748                  "host" : "DESKTOP-43A64G1",
749                  "port" : 27017,
750                  "version" : "4.9.0-rc0",
751                  "gitVersion" : "64540ae7bb8b4298c780ecc154f866ddbc8d676c"
752          },
753          "serverParameters" : {
754                  "internalQueryFacetBufferSizeBytes" : 104857600,
755                  "internalQueryFacetMaxOutputDocSizeBytes" : 104857600,
756                  "internalLookupStageIntermediateDocumentMaxSizeBytes" : 104857600,
757                  "internalDocumentSourceGroupMaxMemoryBytes" : 104857600,
758                  "internalQueryMaxBlockingSortMemoryUsageBytes" : 104857600,
759                  "internalQueryProhibitBlockingMergeOnMongoS" : 0,
760                  "internalQueryMaxAddToSetBytes" : 104857600,
761                  "internalDocumentSourceSetWindowFieldsMaxMemoryBytes" : 104857600
762          },
763          "ok" : 1
764  }
765  >
766
767  *********************************************************************
768  > db.book.find({"categories":"Microsoft
     .NET"}).hint("categories_index").explain("executionStats")
769  {
770          "explainVersion" : "1",
771          "queryPlanner" : {
772                  "namespace" : "company.book",
773                  "indexFilterSet" : false,
774                  "parsedQuery" : {
775                          "categories" : {
776                                  "$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     >
```