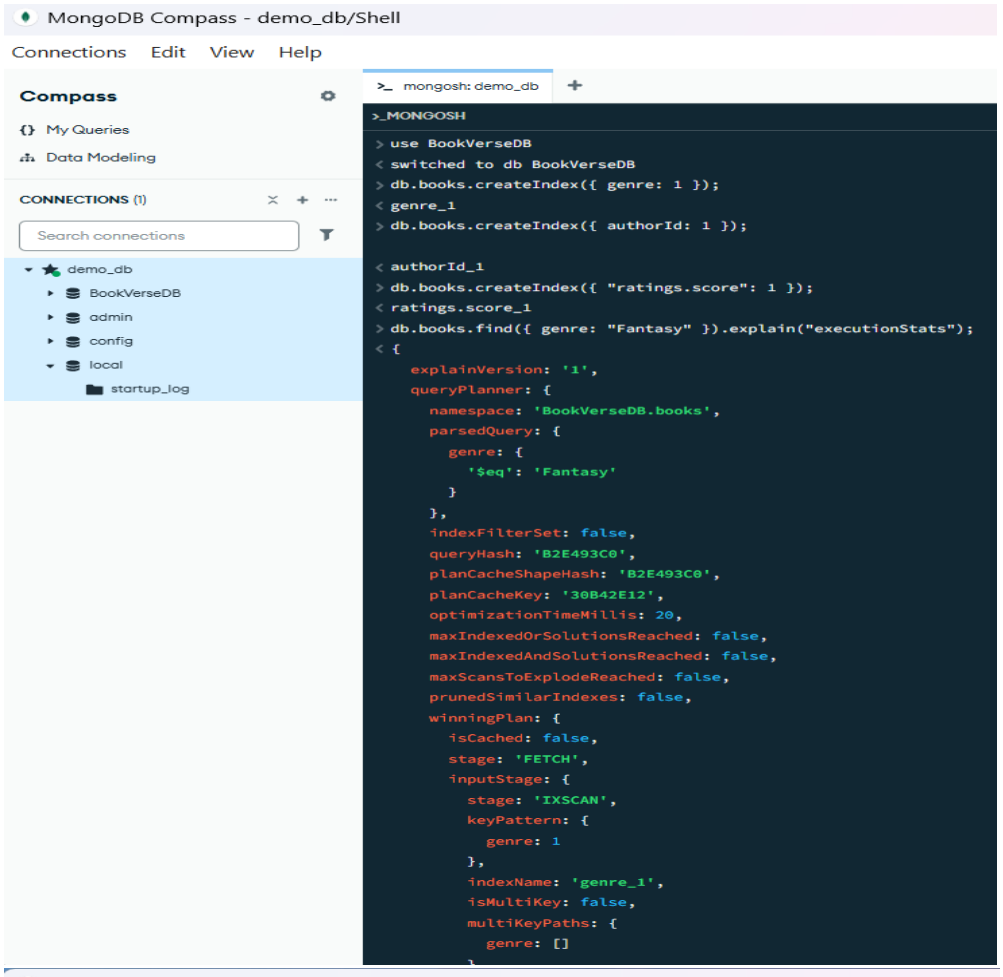
Day 8 Coding Assignment — Indexing, Aggregation, and MongoDB Atlas

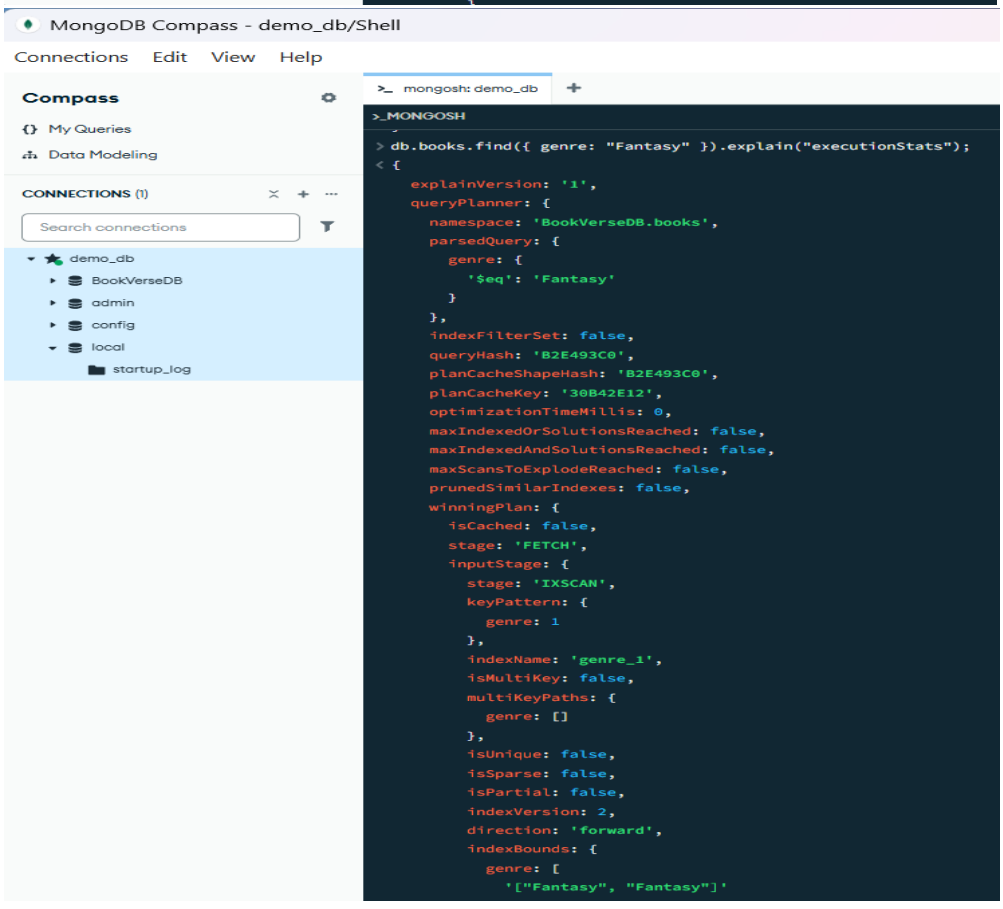
User Story 1 — Indexing and Query Optimization

Code:-

```
// create an index
db.books.createIndex({ genre: 1 });
db.books.createIndex({ authorId: 1 });
db.books.createIndex({ "ratings.score": 1 });
//before and after index
db.books.find({ genre: "Fantasy" }).explain("executionStats");
db.books.find({ genre: "Fantasy" }).explain("executionStats");
// drop an index
db.books.getIndexes();
db.books.dropIndex("genre_1");
```

output:-


MongoDB Compass - demo_db/Shell
Connections Edit View Help
Compass
My Queries
Data Modeling
CONNECTIONS (1)
Search connections
demo_db
BookVerseDB
admin
config
local
startup_log
mongosh: demo_db
>_MONGOSH
> use BookVerseDB
< switched to db BookVerseDB
> db.books.createIndex({ genre: 1 });
< genre_1
> db.books.createIndex({ authorId: 1 });
< authorId_1
> db.books.createIndex({ "ratings.score": 1 });
< ratings.score_1
> db.books.find({ genre: "Fantasy" }).explain("executionStats");
< {
explainVersion: '1',
queryPlanner: {
namespace: 'BookVerseDB.books',
parsedQuery: {
genre: {
'$eq': 'Fantasy'
}
},
indexFilterSet: false,
queryHash: 'B2E493C0',
planCacheShapeHash: 'B2E493C0',
planCacheKey: '30B42E12',
optimizationTimeMillis: 20,
maxIndexedOrSolutionsReached: false,
maxIndexedAndSolutionsReached: false,
maxScansToExplodeReached: false,
prunedSimilarIndexes: false,
winningPlan: {
isCached: false,
stage: 'FETCH',
inputStage: {
stage: 'IXSCAN',
keyPattern: {
genre: 1
},
indexName: 'genre_1',
isMultiKey: false,
multiKeyPaths: {
genre: []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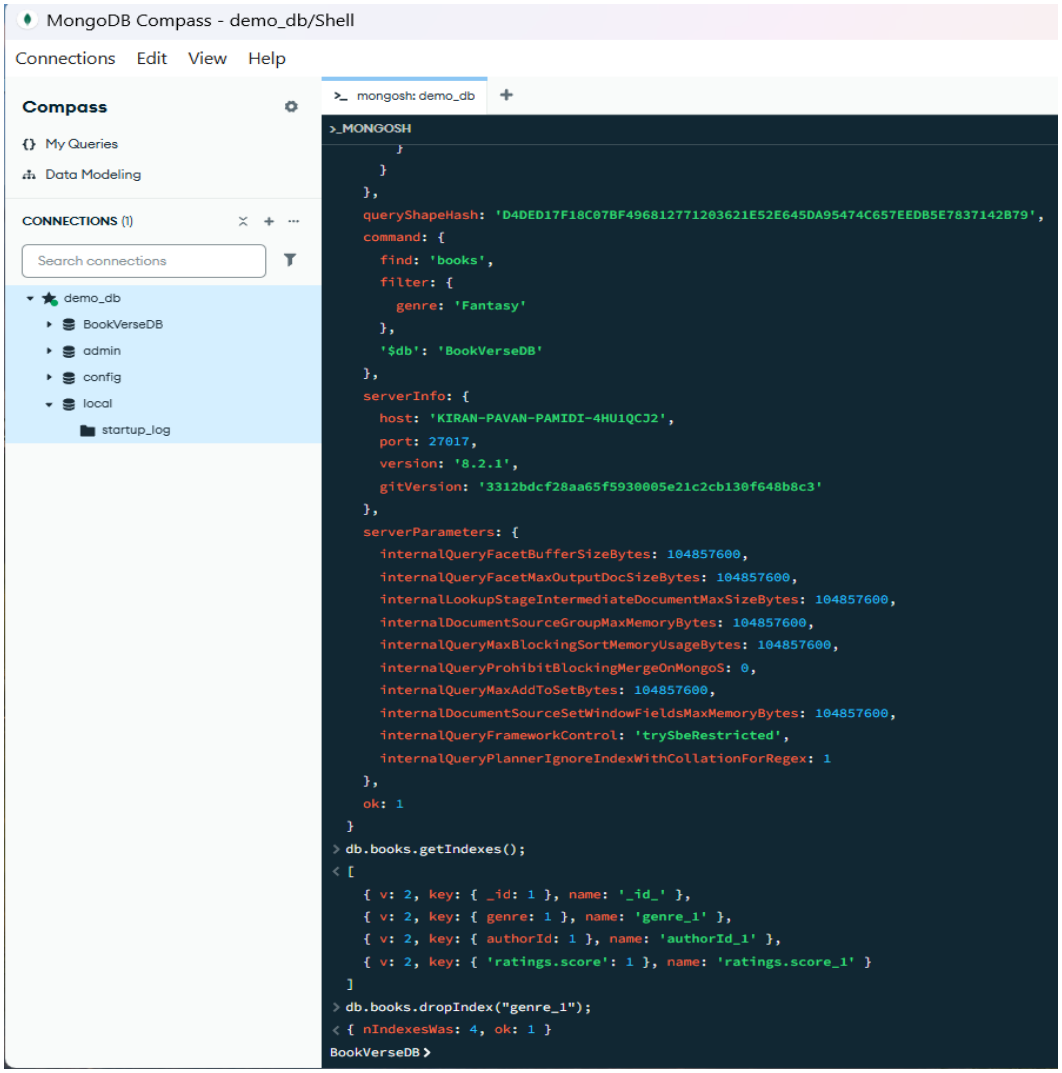
< {
explainVersion: '1',
queryPlanner: {
namespace: 'BookVerseDB.books',
parsedQuery: {
genre: {
'$eq': 'Fantasy'
}
},
indexFilterSet: false,
queryHash: 'B2E493C0',
planCacheShapeHash: 'B2E493C0',
planCacheKey: '30B42E12',
optimizationTimeMillis: 0,
maxIndexedOrSolutionsReached: false,
maxIndexedAndSolutionsReached: false,
maxScansToExplodeReached: false,
prunedSimilarIndexes: false,
winningPlan: {
isCached: false,
stage: 'FETCH',
inputStage: {
stage: 'IXSCAN',
keyPattern: {
genre: 1
},
indexName: 'genre_1',
isMultiKey: false,
multiKeyPaths: {
genre: []
},
isUnique: false,
isSparse: false,
isPartial: false,
indexVersion: 2,
direction: 'forward',
indexBounds: {
genre: [
'["Fantasy", "Fantasy"]'



User Story 2 — Aggregation Framework

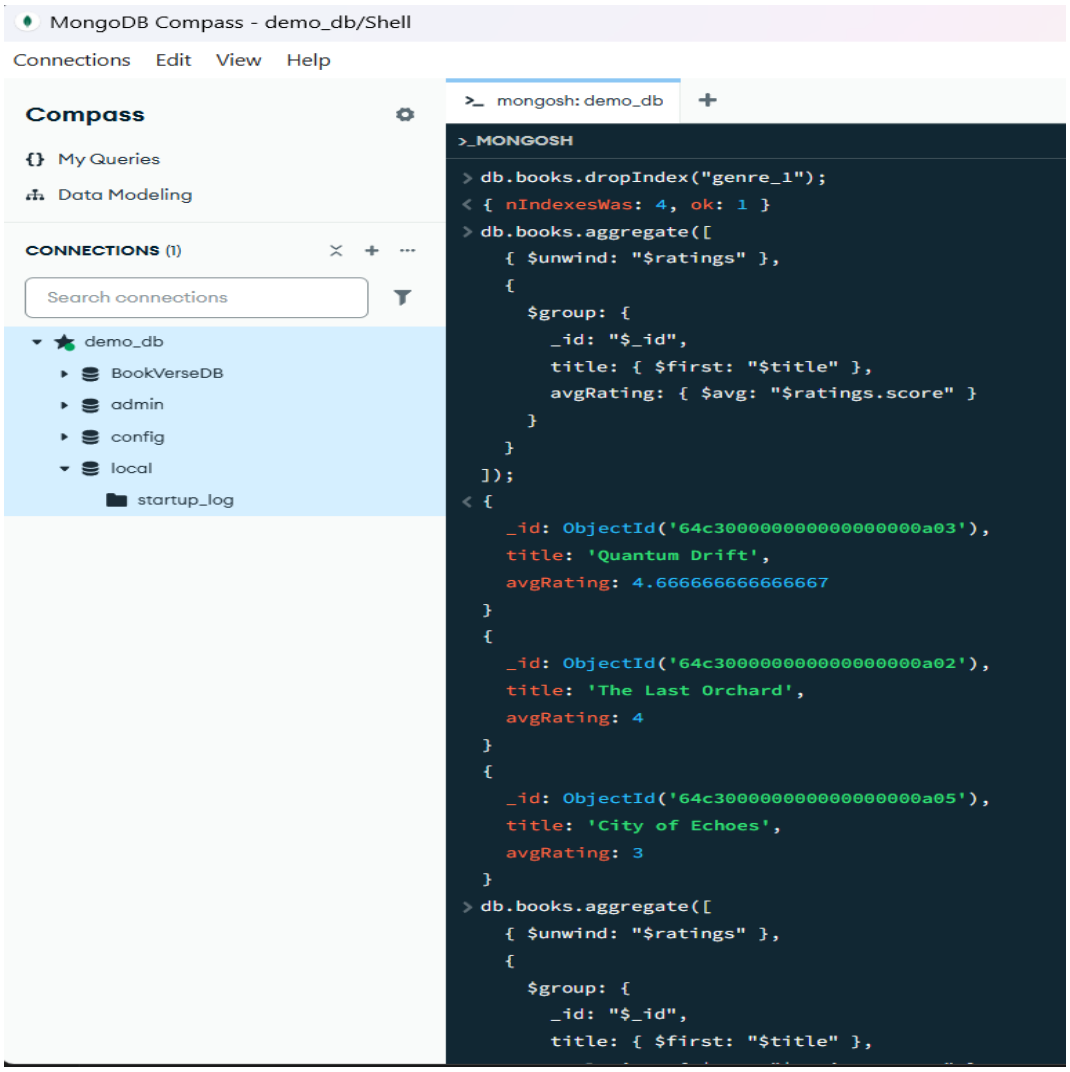
Code:-

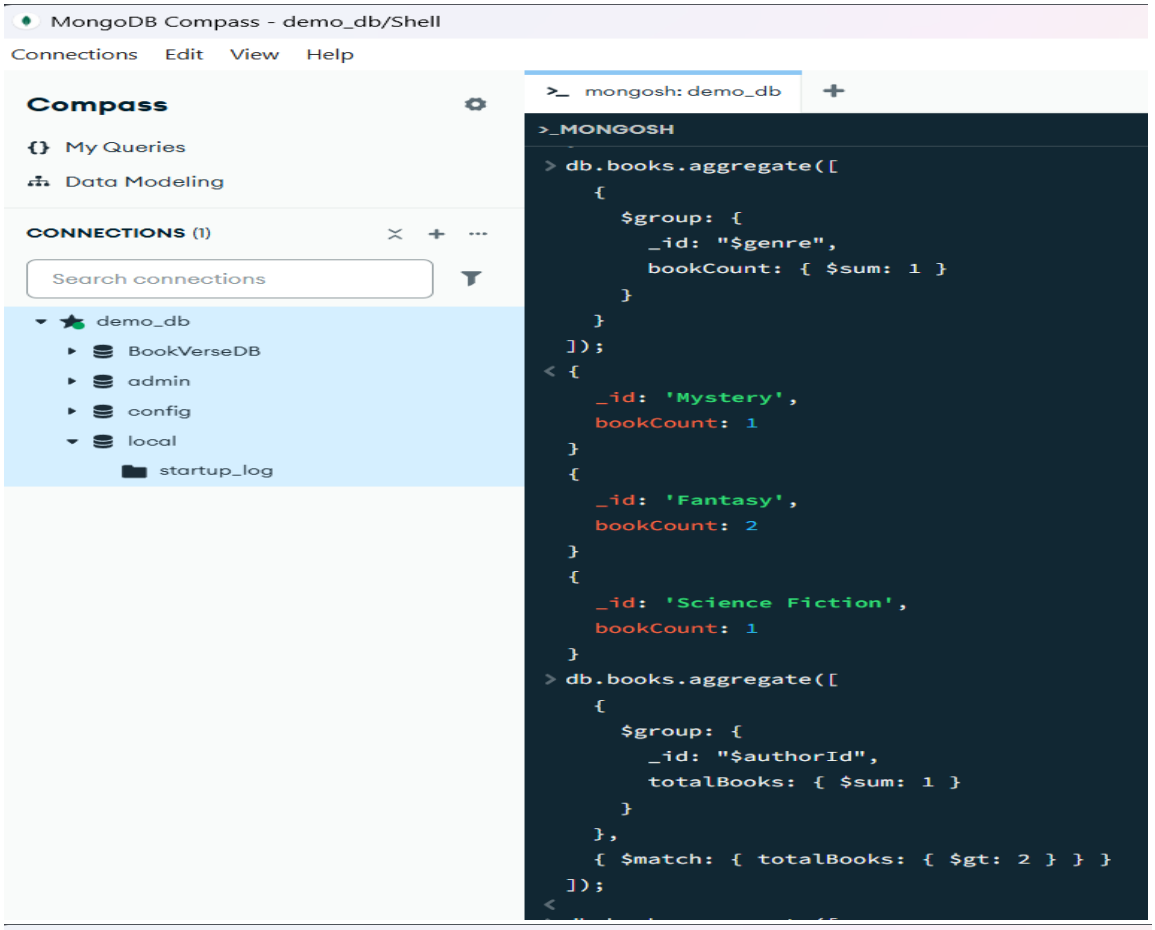
```
db.books.aggregate([
 { $unwind: "$ratings" },
 {
  $group: {
   _id: "$_id",
   title: { $first: "$title" },
   avgRating: { $avg: "$ratings.score" }
  }
```

```
  }
]);
db.books.aggregate([
  { $unwind: "$ratings" },
  {
    $group: {
      _id: "$_id",
      title: { $first: "$title" },
      avgRating: { $avg: "$ratings.score" }
    }
  },
  { $sort: { avgRating: -1 } },
  { $limit: 3 }
]);
db.books.aggregate([
  {
    $group: {
      _id: "$genre",
      bookCount: { $sum: 1 }
    }
  }
]);
db.books.aggregate([
  {
    $group: {
      _id: "$authorId",
      totalBooks: { $sum: 1 }
    }
  },
```

```
  { $match: { totalBooks: { $gt: 2 } } }
]);
db.books.aggregate([
  { $unwind: "$ratings" },
  {
    $group: {
      _id: "$authorId",
      totalPoints: { $sum: "$ratings.score" }
    }
  }
]);
```

Output:-

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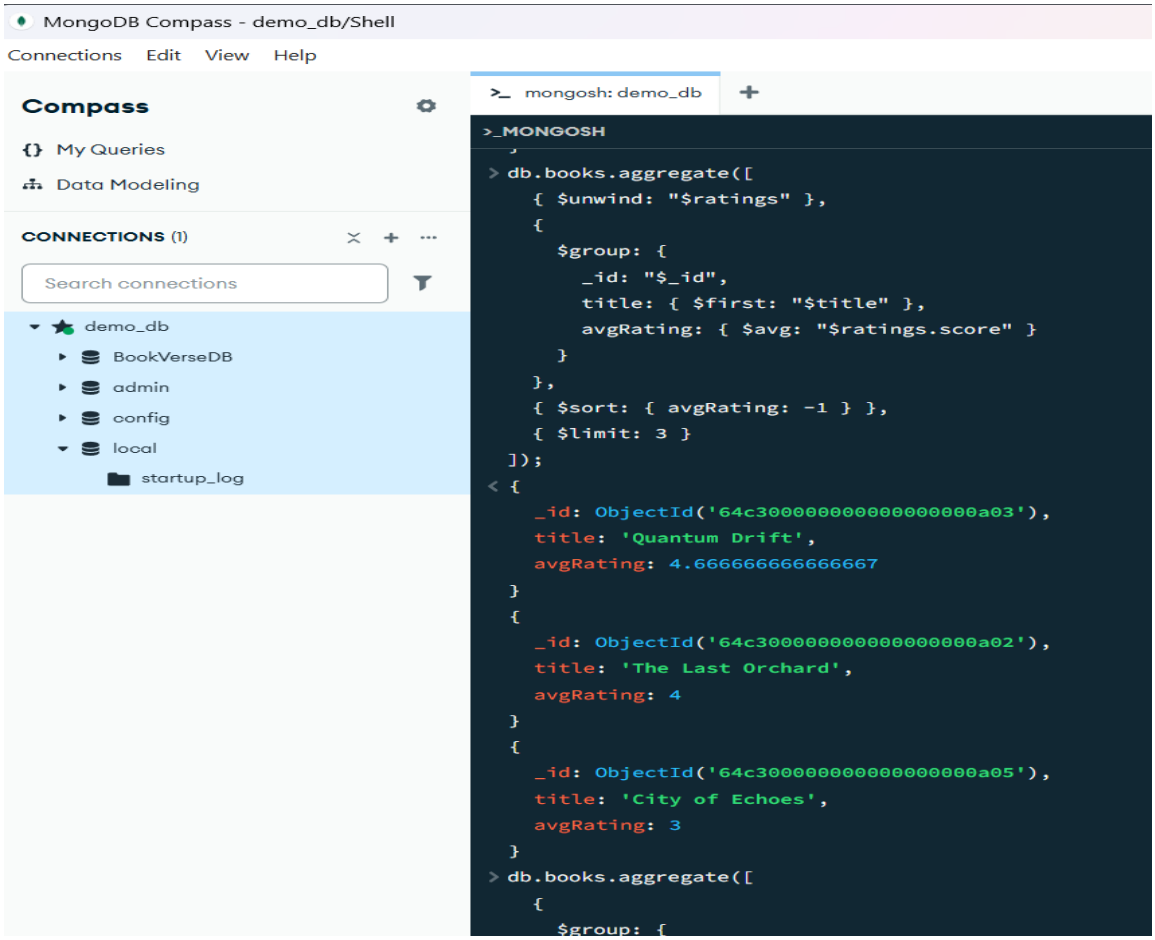
>_MONGOSH
> db.books.aggregate([
{
$group: {
_id: "$genre",
bookCount: { $sum: 1 }
}
}
]);
< {
_id: 'Mystery',
bookCount: 1
}
{
_id: 'Fantasy',
bookCount: 2
}
{
_id: 'Science Fiction',
bookCount: 1
}
> db.books.aggregate([
{
$group: {
_id: "$authorId",
totalBooks: { $sum: 1 }
}
},
{ $match: { totalBooks: { $gt: 2 } } }
]);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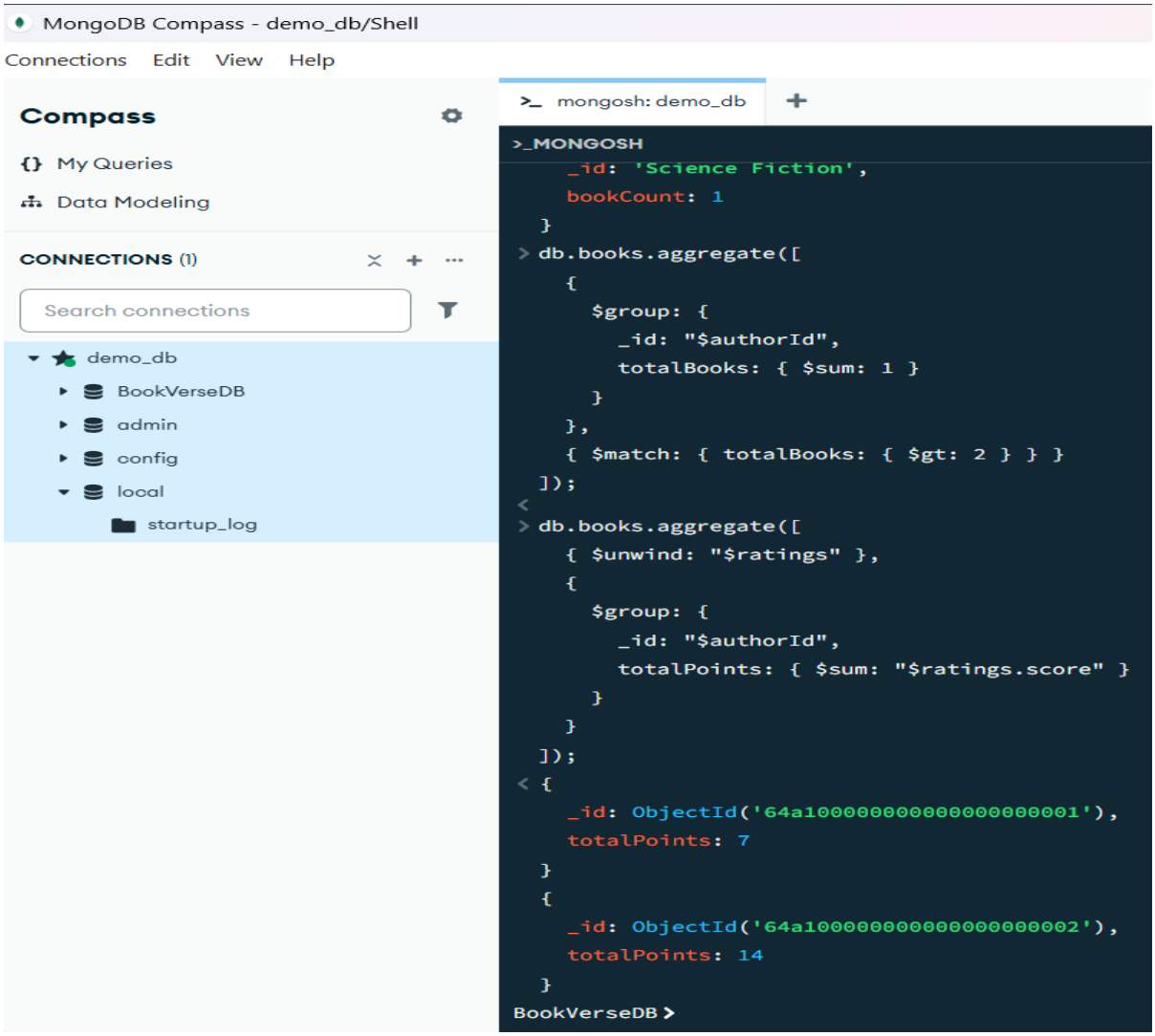
mongosh: demo_db
>_MONGOSH
> db.books.aggregate([
{ $unwind: "$ratings" },
{
$group: {
_id: "$_id",
title: { $first: "$title" },
avgRating: { $avg: "$ratings.score" }
}
},
{ $sort: { avgRating: -1 } },
{ $limit: 3 }
]);
< {
_id: ObjectId('64c30000000000000000a03'),
title: 'Quantum Drift',
avgRating: 4.666666666666667
}
{
_id: ObjectId('64c30000000000000000a02'),
title: 'The Last Orchard',
avgRating: 4
}
{
_id: ObjectId('64c30000000000000000a05'),
title: 'City of Echoes',
avgRating: 3
}
> db.books.aggregate([
{
$group: {



USER STORY 3 — MongoDB Atlas Connection

Code:-

// connect to Atlas

mongosh "mongodb+srv://kiranpavanpamidi:Kiran%40321@cluster0.jnzx4vp.mongodb.net/"

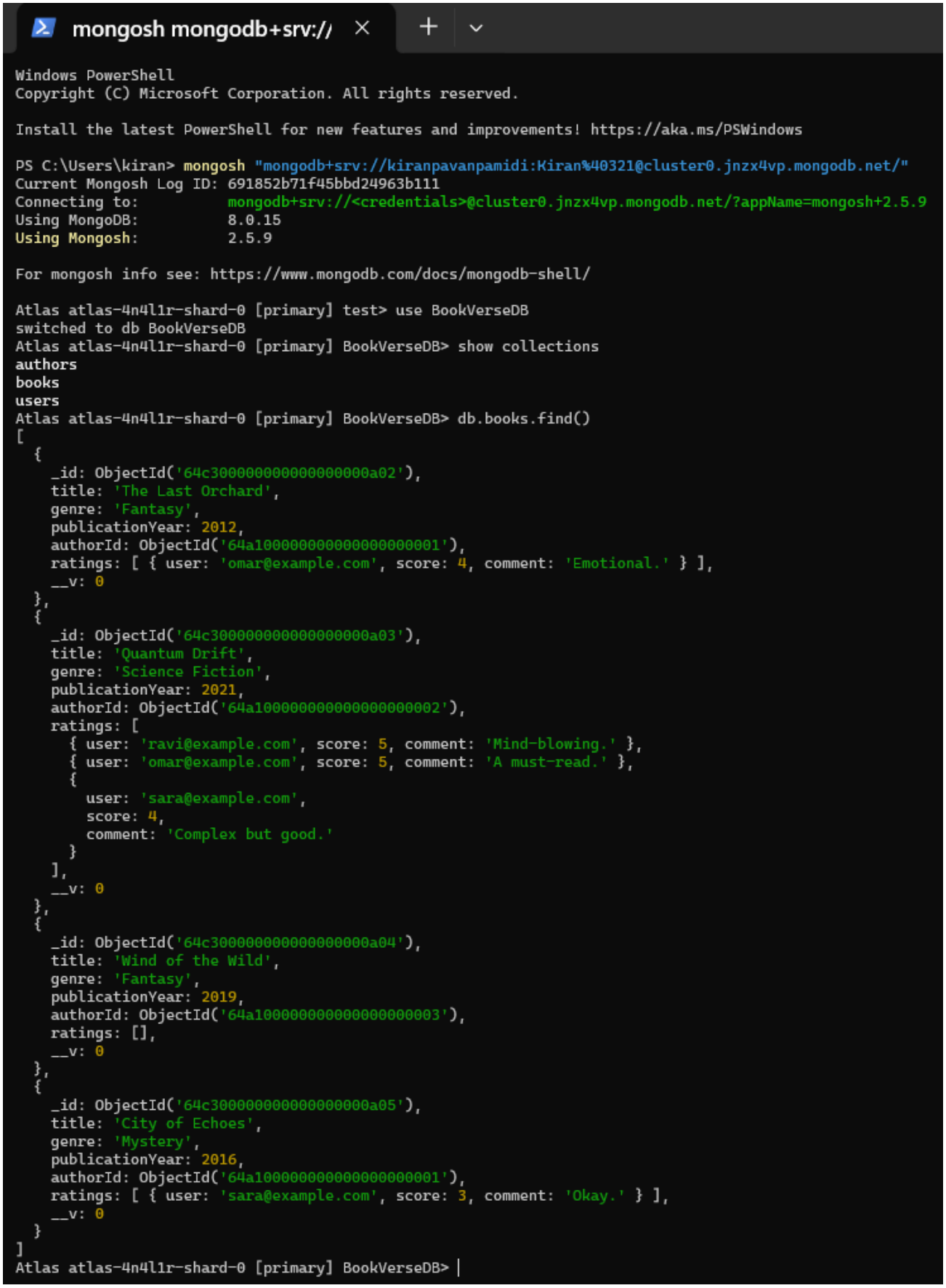
//database

use BookVerseDB

show collections

db.books.find()

Output:-


mongosh mongodb+srv://
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS C:\Users\kiran> mongosh "mongodb+srv://kiranpavanpamidi:Kiran%40321@cluster0.jnzx4vp.mongodb.net/"
Current Mongosh Log ID: 691852b71f45bbd24963b111
Connecting to: mongodb+srv://<credentials>@cluster0.jnzx4vp.mongodb.net/?appName=mongosh+2.5.9
Using MongoDB: 8.0.15
Using Mongosh: 2.5.9
For mongosh info see: https://www.mongodb.com/docs/mongodb-shell/
Atlas atlas-4n4l1r-shard-0 [primary] test> use BookVerseDB
switched to db BookVerseDB
Atlas atlas-4n4l1r-shard-0 [primary] BookVerseDB> show collections
authors
books
users
Atlas atlas-4n4l1r-shard-0 [primary] BookVerseDB> db.books.find()
[
{
_id: ObjectId('64c30000000000000000a02'),
title: 'The Last Orchard',
genre: 'Fantasy',
publicationYear: 2012,
authorId: ObjectId('64a10000000000000000001'),
ratings: [{ user: 'omar@example.com', score: 4, comment: 'Emotional.' }],
__v: 0
},
{
_id: ObjectId('64c30000000000000000a03'),
title: 'Quantum Drift',
genre: 'Science Fiction',
publicationYear: 2021,
authorId: ObjectId('64a10000000000000000002'),
ratings: [
{ user: 'ravi@example.com', score: 5, comment: 'Mind-blowing.' },
{ user: 'omar@example.com', score: 5, comment: 'A must-read.' },
{
user: 'sara@example.com',
score: 4,
comment: 'Complex but good.'
}
],
__v: 0
},
{
_id: ObjectId('64c30000000000000000a04'),
title: 'Wind of the Wild',
genre: 'Fantasy',
publicationYear: 2019,
authorId: ObjectId('64a10000000000000000003'),
ratings: [],
__v: 0
},
{
_id: ObjectId('64c30000000000000000a05'),
title: 'City of Echoes',
genre: 'Mystery',
publicationYear: 2016,
authorId: ObjectId('64a10000000000000000001'),
ratings: [{ user: 'sara@example.com', score: 3, comment: 'Okay.' }],
__v: 0
}
]
Atlas atlas-4n4l1r-shard-0 [primary] BookVerseDB>