Questions:

1)What genre is the movie CopyCat in?

db.movies.find({"Title": /Copycat/ }).pretty()

```
> db.movies.find({"Title": /Copycat/}).pretty()
{
        "_id" : ObjectId("58a12862ca7267baaae5b8f6"),
        "MovieID" : "22",
        "Title" : "Copycat (1995)",
        "Genres" : "Crime|Drama|Horror|Mystery|Thriller\n"
}
```

the Genres are Crime, Drama, Horror, Mystery, and Thriller.

2)what genre has the most movies?

the genre which has the most movies is Drama, the following diagram is query language.

```
> action=db.movies.find({"Genres": { $in: ['Action']}}).count()
1473
> adventure=db.movies.find({"Genres": { $in: ['Adventure']}}).count()
1025
> animation=db.movies.find({"Genres": { $in: ['Animation']}}).count()
286
> children=db.movies.find({"Genres": { $in: ["Children's"]}}).count()
0
> comedy=db.movies.find({"Genres": { $in: ["Comedy"]}}).count()
3703
> crime=db.movies.find({"Genres": { $in: ["Crime"]}}).count()
1118
> documentary=db.movies.find({"Genres": { $in: ["Documentary"]}}).count()
482
> drama=db.movies.find({"Genres": { $in: ["Drama"]}}).count()
5339
> fantacy=db.movies.find({"Genres": { $in: ["Fantasy"]}}).count()
543
> filmnoir=db.movies.find({"Genres": { $in: ["Film-Noir"]}}).count()
148
> horror=db.movies.find({"Genres": { $in: ["Horror"]}}).count()
1013
> musical=db.movies.find({"Genres": { $in: ["Musical"]}}).count()
436
> mystery=db.movies.find({"Genres": { $in: ["Musical"]}}).count()
436
> mystery=db.movies.find({"Genres": { $in: ["Mystery"]}}).count()
509
> romance=db.movies.find({"Genres": { $in: ["Romance"]}}).count()
1685
> scifi=db.movies.find({"Genres": { $in: ["Sci-Fi"]}}).count()
754
> thriller=db.movies.find({"Genres": { $in: ["Thriller"]}}).count()
1706
> war=db.movies.find({"Genres": { $in: ["War"]}}).count()
511
> western=db.movies.find({"Genres": { $in: ["Western"]}}).count()
275
>
```

3)what tags did user 146 use to describe the movie "2001: A Space Odyssey"

```
> db.movies.find({"Title": /A Space Odyssey/}).pretty()
{
        "_id" : ObjectId("58a12863ca7267baaae5bc6c"),
        "MovieID" : "924",
        "Title" : "2001: A Space Odyssey (1968)",
        "Genres" : "Adventure|Sci-Fi\n"
}
```

we query the MovieID of “2001: A Space Odyssey” the movieID is 924. and then we query the tags in tags collections

```
> db.tags.find({$and: [{"UserID":"146"},{"MovieID":"924"}]}).pretty()
{
        "_id" : ObjectId("58a5a905ca72672ed24d0e33"),
        "UserID" : "146",
        "MovieID" : "924",
        "Tags" : "Arthur C. Clarke",
        "Timestamp" : "1220880014\n"
}
{
        "_id" : ObjectId("58a5a905ca72672ed24d0e34"),
        "UserID" : "146",
        "MovieID" : "924",
        "Tags" : "artificial intelligence",
        "Timestamp" : "1195559992\n"
}
{
        "_id" : ObjectId("58a5a905ca72672ed24d0e35"),
        "UserID" : "146",
        "MovieID" : "924",
        "Tags" : "based on a book",
        "Timestamp" : "1162263470\n"
}
>
```

the tags for movies “2001: A Space Odyssey” of user 146 are “Arthur C. Clarks”,”artificial intelligence”, and “based on a book”

4)What are the top 5 movies titles with the highest avg rating?

First of all create a collection to store the movies ID and average of each movies ratings

```
> answer=db.Rating.group(
...   {
...    key: { "MovieID": 1},
...    initial: { total: 0, count: 0 },
...    reduce: function( curr, result)  {
...                result.total += curr.Rating;
...                result.count++;
...            },
...
...    finalize: function(result) {
...                    result.avg = result.total/result.count;
...                    delete result.total;
...                    delete result.count;
...            }
...     })
[
        {
                "MovieID" : "122",
                "avg" : 2.861318407960199
        },
        {
                "MovieID" : "185",
                "avg" : 3.1252086811352253
        },
        {
                "MovieID" : "231",
                "avg" : 2.936950310906952
        },
        {
                "MovieID" : "292",
                "avg" : 3.4184136858475895
        },
        {
                "MovieID" : "316",
                "avg" : 3.3493527080581242
        },
        {
                "MovieID" : "329",
                "avg" : 3.3362714170841836
        },
        {
                "MovieID" : "355",
                "avg" : 2.480152814014163
        },
        {
                "MovieID" : "356",
                "avg" : 4.0135821458629595
        },
        {
                "MovieID" : "362",
                "avg" : 3.4477091633466137
        },
        {
                "MovieID" : "364",
                "avg" : 3.7485933625786765
        },
        {
                "MovieID" : "370",
                "avg" : 2.9600487210718636
        },
        {
                "MovieID" : "377",
                "avg" : 3.5289498062994777
```

and then insert it into a new collection

```
> db.moviesavg.insert(answer)
BulkWriteResult({
        "writeErrors" : [ ],
        "writeConcernErrors" : [ ],
        "nInserted" : 10677,
        "nUpserted" : 0,
        "nMatched" : 0,
        "nModified" : 0,
        "nRemoved" : 0,
        "upserted" : [ ]
})
```

and find the top 5 ratings and movies ID

```
> db.moviesavg.find().sort({ avg: -1}).limit(5)
{ "_id" : ObjectId("58ab456950dc10e2ed56e1c1"), "MovieID" : "53355", "avg" : 5 }
{ "_id" : ObjectId("58ab456950dc10e2ed56e1c3"), "MovieID" : "51209", "avg" : 5 }
{ "_id" : ObjectId("58ab456950dc10e2ed56e1da"), "MovieID" : "33264", "avg" : 5 }
{ "_id" : ObjectId("58ab456950dc10e2ed56e1ff"), "MovieID" : "42783", "avg" : 5 }
{ "_id" : ObjectId("58ab456950dc10e2ed56e224"), "MovieID" : "64275", "avg" : 5 }
```

and then find the movie's title of top 5 movies ratings

```
> db.movies.find( { $or:[ {"MovieID":"53355"},{"MovieID":"51209"},{"MovieID":"33264"},{"MovieID":"42783"}
,{"MovieID":"64275"}]}).pretty()
{
        "_id" : ObjectId("58a12865ca7267baaae5dc5c"),
        "MovieID" : "33264",
        "Title" : "Satan's Tango (Sátántangó) (1994)",
        "Genres" : "Drama\n"
}
{
        "_id" : ObjectId("58a12865ca7267baaae5dda1"),
        "MovieID" : "42783",
        "Title" : "Shadows of Forgotten Ancestors (1964)",
        "Genres" : "Drama|Romance\n"
}
{
        "_id" : ObjectId("58a12865ca7267baaae5df2e"),
        "MovieID" : "51209",
        "Title" : "Fighting Elegy (Kenka erejii) (1966)",
        "Genres" : "Action|Comedy\n"
}
{
        "_id" : ObjectId("58a12865ca7267baaae5df98"),
        "MovieID" : "53355",
        "Title" : "Sun Alley (Sonnenallee) (1999)",
        "Genres" : "Comedy|Romance\n"
}
{
        "_id" : ObjectId("58a12866ca7267baaae5e257"),
        "MovieID" : "64275",
        "Title" : "Blue Light, The (Das Blaue Licht) (1932)",
        "Genres" : "Drama|Fantasy|Mystery\n"
}
```

the top 5 movies are "Satan's Tango (1994)", "Shadows of Forgotten Ancestors (1964)", "Fighting Elegy (1966)" , "Sun Alley (1999)" and "Blue Light, The (Das Blaue Licht) (1932)".

5) Write 3 different queries of your choice to demonstrate that your data storage is working.

a) find all the rating information for a specified movie called “Heat(1995)”

```
db.movies.aggregate(
        [
            {
                $lookup:  {
                            from:"ratings",
                            localField:"MovieID",
                            foreignField:"MovieID",
                             as:"rating_docs"  }
             },
                { $out:"movies_ratings"}]).pretty()

db.movies_ratings.find({“Title”:”Heat (1995)”}).pretty()
```

```
> db.movies_ratings.find({"Title":"Heat (1995)"}).pretty()
{
        "_id" : ObjectId("58a12862ca7267baaae5b8e6"),
        "MovieID" : "6",
        "Title" : "Heat (1995)",
        "Genres" : "Action|Crime|Thriller\n",
        "rating_docs" : [
                {
                        "_id" : ObjectId("58a51125ca726723c2ec01e1"),
                        "UserID" : "8",
                        "MovieID" : "6",
                        "Raing" : "4",
                        "Timestamp" : "1116547028\n"
                },
                {
                        "_id" : ObjectId("58a51126ca726723c2ec0a4f"),
                        "UserID" : "24",
                        "MovieID" : "6",
                        "Raing" : "3",
                        "Timestamp" : "868254301\n"
                },
                {
                        "_id" : ObjectId("58a51126ca726723c2ec0b8f"),
                        "UserID" : "33",
                        "MovieID" : "6",
                        "Raing" : "3",
                        "Timestamp" : "849544240\n"
                },
                {
                        "_id" : ObjectId("58a51126ca726723c2ec0eae"),
                        "UserID" : "36",
                        "MovieID" : "6",
                        "Raing" : "5",
                        "Timestamp" : "1049770748\n"
                },
                {
                        "_id" : ObjectId("58a51127ca726723c2ec18ad"),
                        "UserID" : "57",
                        "MovieID" : "6",
                        "Raing" : "4",
                        "Timestamp" : "868259640\n"
                },
                {
                        "_id" : ObjectId("58a51128ca726723c2ec1ad6"),
                        "UserID" : "64",
                        "MovieID" : "6",
                        "Raing" : "3",
                        "Timestamp" : "857914274\n"
                },
                {
                        "_id" : ObjectId("58a51128ca726723c2ec1ec1"),
                        "UserID" : "73",
                        "MovieID" : "6",
                        "Raing" : "5",
                        "Timestamp" : "974298142\n"
                },
                {
                        "_id" : ObjectId("58a51128ca726723c2ec2611"),
                        "UserID" : "90",
```

b) what movies has the lowest average ratings and what are the tags for this movies??
find the movieID of the lowest average ratings movie

```
> db.moviesavg.find().sort({ avg: 1}).limit(1).pretty()
{
        "_id" : ObjectId("58ab456950dc10e2ed56e018"),
        "MovieID" : "5805",
        "avg" : 0.5
}
```

and then look up the movie Title

```
> db.movies.find({"MovieID": "5805"}).pretty()
{
        "_id" : ObjectId("58ab64b8ca7267edf818965b"),
        "MovieID" : "5805",
        "Title" : "Besotted (2001)",
        "Genres" : [
                "Drama"
        ]
}
```

the movie is “Besotted (2001)”

c) how many ratings for this movies ”Man of the House (1995)”?

```
> db.movies.find({"Title":"Man of the House (1995)"}).pretty()
{
        "_id" : ObjectId("58ab64b7ca7267edf818811f"),
        "MovieID" : "274",
        "Title" : "Man of the House (1995)",
        "Genres" : [
                "Comedy"
        ]
}
```

```
> db.Rating.find({"MovieID": "274"}).count()
732
```

there are 732 ratings is for movie ”Man of the House (1995)”