Import Libraries

In [2]:
```
import pandas as pd
```

Reading the Dataset

In [4]:
```
movies=pd.read_csv(r'C:\Users\HP\Downloads\archive\movie.csv')
movies.shape
```

Out[4]:
```
(27278, 3)
```

In [5]:
```
print(type(movies))
movies.head()
```

```
<class 'pandas.core.frame.DataFrame'>
```

Out[5]:

	movieId	title	genres
0	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy
1	2	Jumanji (1995)	Adventure|Children|Fantasy
2	3	Grumpier Old Men (1995)	Comedy|Romance
3	4	Waiting to Exhale (1995)	Comedy|Drama|Romance
4	5	Father of the Bride Part II (1995)	Comedy

In [6]:
```
tags=pd.read_csv(r'C:\Users\HP\Downloads\archive\tag.csv')
tags.shape
```

Out[6]:
```
(465564, 4)
```

In [7]:
```
print(type(tags))
tags.head()
```

```
<class 'pandas.core.frame.DataFrame'>
```

Out[7]:

	userId	movieId	tag	timestamp
0	18	4141	Mark Waters	2009-04-24 18:19:40
1	65	208	dark hero	2013-05-10 01:41:18
2	65	353	dark hero	2013-05-10 01:41:19
3	65	521	noir thriller	2013-05-10 01:39:43
4	65	592	dark hero	2013-05-10 01:41:18

In [8]:
```
ratings=pd.read_csv(r'C:\Users\HP\Downloads\archive\rating.csv')
ratings.shape
```

Out[8]:
```
(20000263, 4)
```

In [9]:
```python
print(type(ratings))
ratings.head()
```

```
<class 'pandas.core.frame.DataFrame'>
```

Out[9]:

	userId	movieId	rating	timestamp
0	1	2	3.5	2005-04-02 23:53:47
1	1	29	3.5	2005-04-02 23:31:16
2	1	32	3.5	2005-04-02 23:33:39
3	1	47	3.5	2005-04-02 23:32:07
4	1	50	3.5	2005-04-02 23:29:40

In [10]:
```python
del ratings['timestamp']
del tags['timestamp']
```

Data Structures

In [12]:
```python
row_0 = tags.iloc[0]
type(row_0)
```

Out[12]:
```
pandas.core.series.Series
```

In [13]:
```python
print(row_0)
```

```
userId              18
movieId           4141
tag        Mark Waters
Name: 0, dtype: object
```

In [14]:
```python
row_0.index
```

Out[14]:
```
Index(['userId', 'movieId', 'tag'], dtype='object')
```

In [15]:
```python
row_0['userId']
```

Out[15]:
```
18
```

In [16]:
```python
'rating' in row_0
```

Out[16]:
```
False
```

In [17]:
```python
row_0.name
```

Out[17]:
```
0
```

In [18]:
```python
row_0=row_0.rename('firstrow')
row_0.name
```

Out[18]:
```
'firstrow'
```

Data Frames

```
In [20]: tags.head()
```

Out[20]:

	userId	movieId	tag
0	18	4141	Mark Waters
1	65	208	dark hero
2	65	353	dark hero
3	65	521	noir thriller
4	65	592	dark hero

```
In [21]: tags.index
```

```
Out[21]: RangeIndex(start=0, stop=465564, step=1)
```

```
In [22]: tags.columns
```

```
Out[22]: Index(['userId', 'movieId', 'tag'], dtype='object')
```

```
In [23]: tags.iloc[[0,11,500]]
```

Out[23]:

	userId	movieId	tag
0	18	4141	Mark Waters
11	65	1783	noir thriller
500	342	55908	entirely dialogue

Descriptive Statistics

```
In [25]: ratings.describe()
```

Out[25]:

	userId	movieId	rating
count	2.000026e+07	2.000026e+07	2.000026e+07
mean	6.904587e+04	9.041567e+03	3.525529e+00
std	4.003863e+04	1.978948e+04	1.051989e+00
min	1.000000e+00	1.000000e+00	5.000000e-01
25%	3.439500e+04	9.020000e+02	3.000000e+00
50%	6.914100e+04	2.167000e+03	3.500000e+00
75%	1.036370e+05	4.770000e+03	4.000000e+00
max	1.384930e+05	1.312620e+05	5.000000e+00

In [26]:
```
ratings['rating'].describe()
```

Out[26]:
```
count    2.000026e+07
mean     3.525529e+00
std      1.051989e+00
min      5.000000e-01
25%      3.000000e+00
50%      3.500000e+00
75%      4.000000e+00
max      5.000000e+00
Name: rating, dtype: float64
```

In [27]:
```
ratings.mean()
```

Out[27]:
```
userId     69045.872583
movieId     9041.567330
rating         3.525529
dtype: float64
```

In [28]:
```
ratings['rating'].mean()
```

Out[28]:
```
3.5255285642993797
```

In [29]:
```
ratings.min()
```

Out[29]:
```
userId     1.0
movieId    1.0
rating     0.5
dtype: float64
```

In [30]:
```
ratings['rating'].min()
```

Out[30]:
```
0.5
```

In [31]:
```
ratings.max()
```

Out[31]:
```
userId     138493.0
movieId    131262.0
rating          5.0
dtype: float64
```

In [32]:
```
ratings['rating'].max()
```

Out[32]:
```
5.0
```

In [33]:
```
ratings.std()
```

Out[33]:
```
userId     40038.626653
movieId    19789.477445
rating         1.051989
dtype: float64
```

In [34]:
```
ratings['rating'].std()
```

Out[34]:
```
1.051988919275684
```

In [35]:
```
ratings.mode()
```

Out[35]:

	userId	movieId	rating
0	118205	296	4.0

In [36]:
```
ratings['rating'].mode()
```

Out[36]:
```
0    4.0
Name: rating, dtype: float64
```

In [37]:
```
ratings.corr() # correlation
```

Out[37]:

	userId	movieId	rating
userId	1.000000	-0.000850	0.001175
movieId	-0.000850	1.000000	0.002606
rating	0.001175	0.002606	1.000000

In [38]:
```
filter1 = ratings['rating'] > 10
print(filter1)
filter1.any()
```

```
0           False
1           False
2           False
3           False
4           False
            ...  
20000258    False
20000259    False
20000260    False
20000261    False
20000262    False
Name: rating, Length: 20000263, dtype: bool
```

Out[38]:
```
False
```

In [39]:
```
filter2 = ratings['rating'] > 0
filter2.all()
```

Out[39]:
```
True
```

Data Cleaning

In [41]:
```
movies.shape
```

Out[41]:
```
(27278, 3)
```

In [42]:
```
movies.isnull().any().any()
```

Out[42]:
```
False
```

In [43]:
```
ratings.shape
```

```
Out[43]: (20000263, 3)
```

```
In [44]: ratings.isnull().any().any()
```

```
Out[44]: False
```

```
In [45]: tags.shape
```

```
Out[45]: (465564, 3)
```

```
In [46]: tags.isnull().any().any()# consists null values
```

```
Out[46]: True
```

```
In [47]: tags=tags.dropna() # dropping all the null values and rows
```

```
In [48]: tags.isnull().any().any() # removed all the null values
```

```
Out[48]: False
```

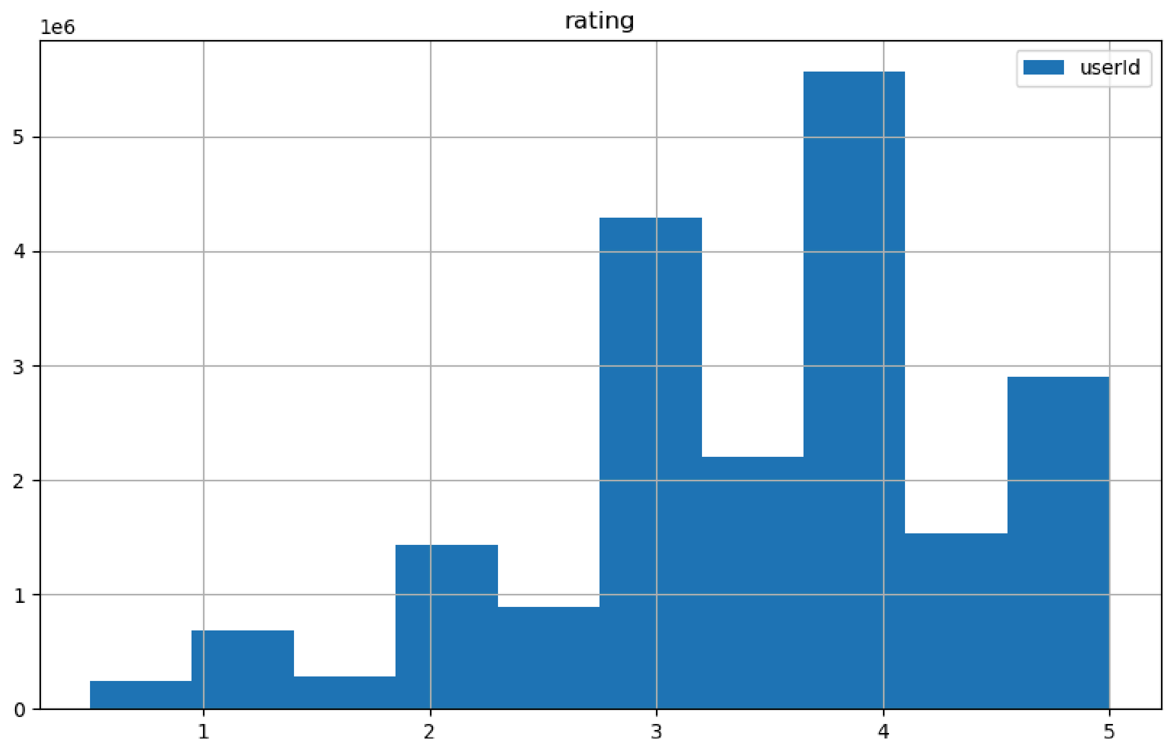
```
In [49]: tags.shape
```

```
Out[49]: (465548, 3)
```

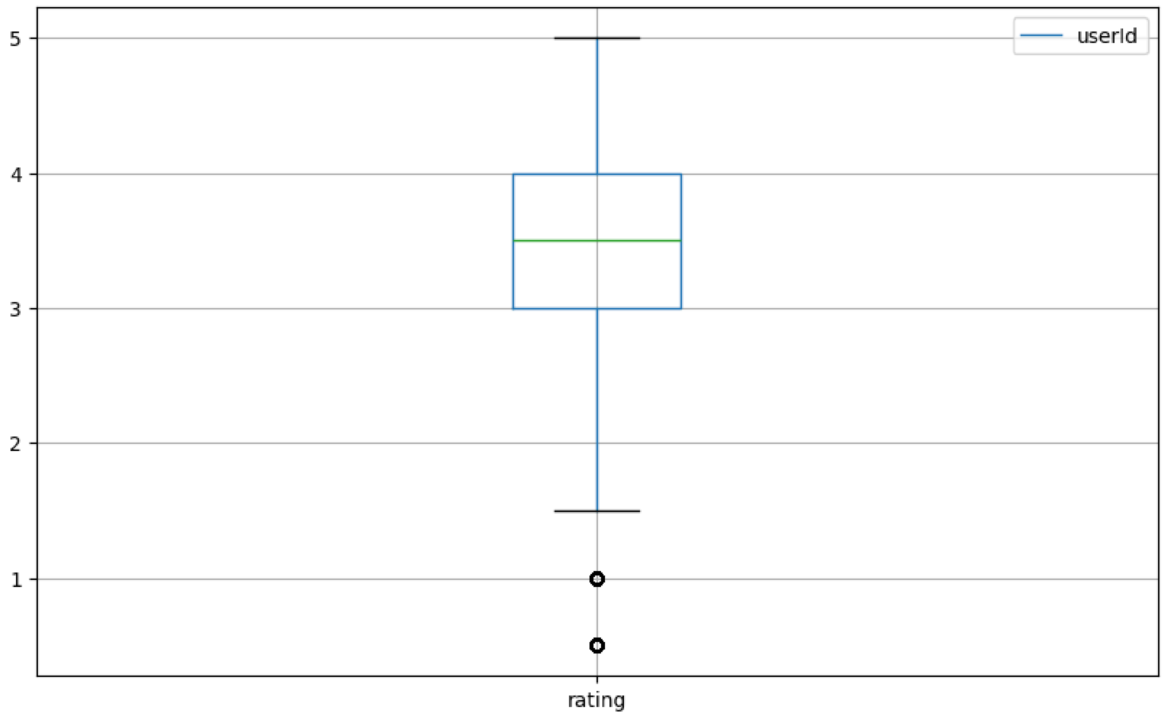
Data Visualization

```
In [51]: import matplotlib.pyplot as plt
```

```
In [52]: %matplotlib inline
         ratings.hist(column='rating',figsize=(10,6))
         plt.legend(ratings)
         plt.show()
```



In [53]:
```
ratings.boxplot(column='rating', figsize=(10,6))
plt.legend(ratings)
plt.show()
```



Column Slicing

In [55]:
```
tags.head()
```

Out[55]:

	userId	movieId	tag
0	18	4141	Mark Waters
1	65	208	dark hero
2	65	353	dark hero
3	65	521	noir thriller
4	65	592	dark hero

In [56]:
```
tags['tag'].head()
```

Out[56]:
```
0      Mark Waters
1        dark hero
2        dark hero
3    noir thriller
4        dark hero
Name: tag, dtype: object
```

In [57]:
```
movies.head()
```

Out[57]:

	movieId	title	genres
0	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy
1	2	Jumanji (1995)	Adventure|Children|Fantasy
2	3	Grumpier Old Men (1995)	Comedy|Romance
3	4	Waiting to Exhale (1995)	Comedy|Drama|Romance
4	5	Father of the Bride Part II (1995)	Comedy

In [58]:
```
movies[['title','genres']].head()
```

Out[58]:

	title	genres
0	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy
1	Jumanji (1995)	Adventure|Children|Fantasy
2	Grumpier Old Men (1995)	Comedy|Romance
3	Waiting to Exhale (1995)	Comedy|Drama|Romance
4	Father of the Bride Part II (1995)	Comedy

In [59]:
```
ratings.head()
```

Out[59]:

	userId	movieId	rating
0	1	2	3.5
1	1	29	3.5
2	1	32	3.5
3	1	47	3.5
4	1	50	3.5

In [60]:
```
ratings[['movieId','rating']].head()
```

Out[60]:

	movieId	rating
0	2	3.5
1	29	3.5
2	32	3.5
3	47	3.5
4	50	3.5

In [61]:
```
ratings[-10:]
```

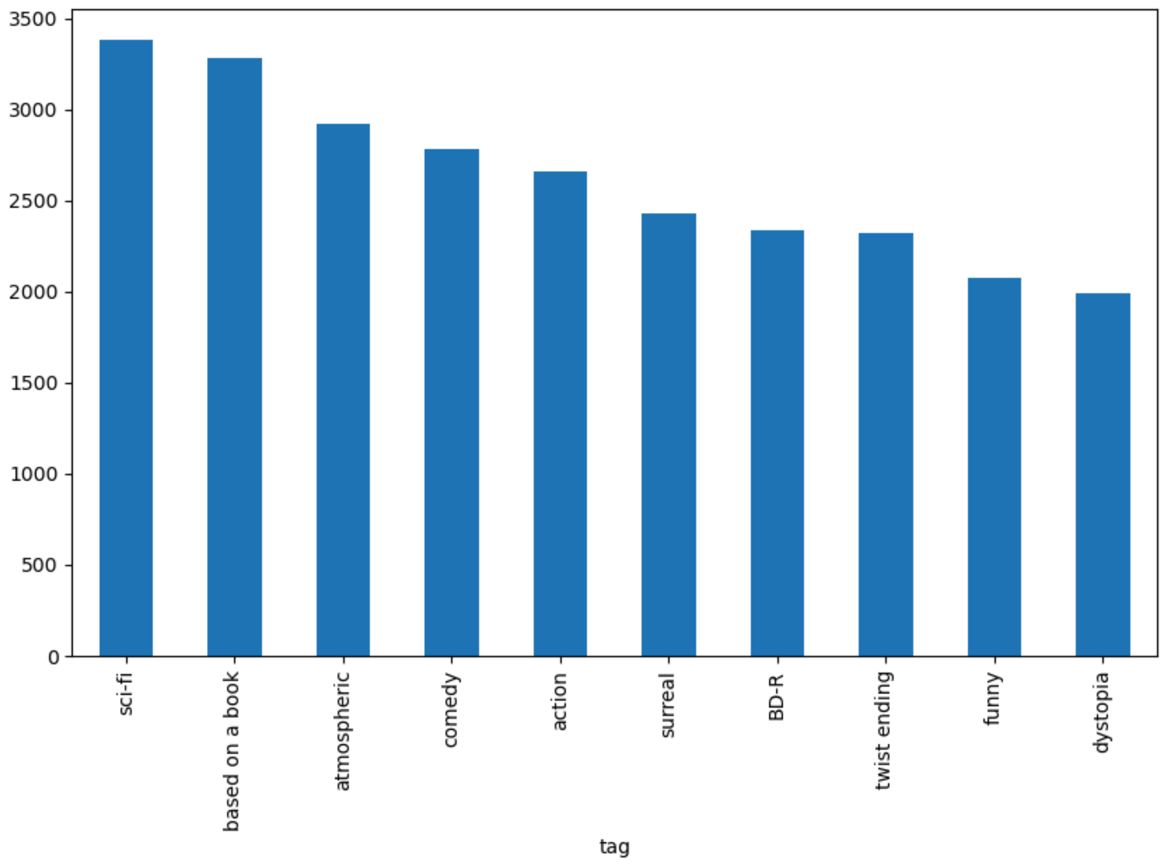
Out[61]:

	userId	movieId	rating
20000253	138493	60816	4.5
20000254	138493	61160	4.0
20000255	138493	65682	4.5
20000256	138493	66762	4.5
20000257	138493	68319	4.5
20000258	138493	68954	4.5
20000259	138493	69526	4.5
20000260	138493	69644	3.0
20000261	138493	70286	5.0
20000262	138493	71619	2.5

In [62]:
```
tag_counts=tags['tag'].value_counts()
tag_counts[-10:]
```

Out[62]:
```
tag
missing child                  1
Ron Moore                      1
Citizen Kane                   1
mullet                         1
biker gang                     1
Paul Adelstein                 1
the wig                        1
killer fish                    1
genetically modified monsters  1
topless scene                  1
Name: count, dtype: int64
```

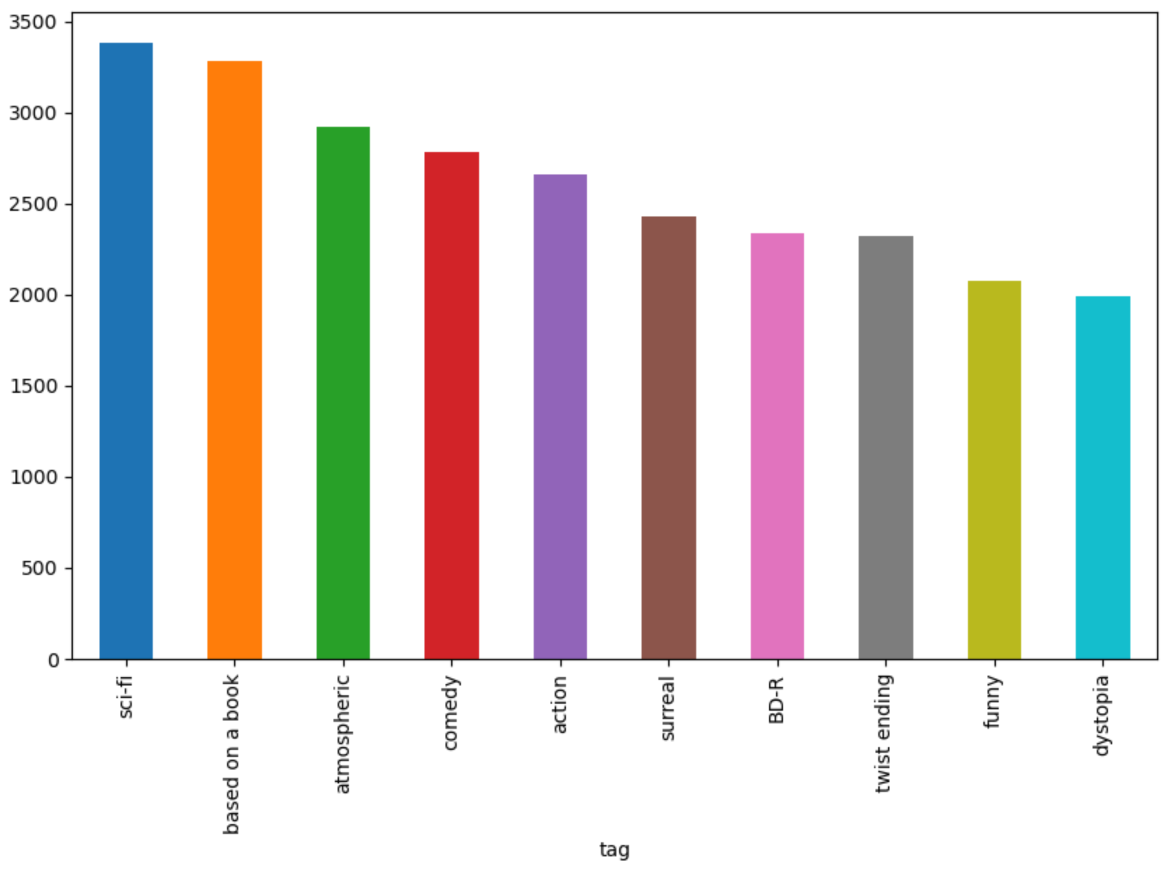
In [63]:
```
tag_counts[:10].plot(kind='bar',figsize=(10,6))
plt.show()
```



In [64]:
```
# Generate a list of distinct colors
colors = plt.cm.get_cmap('tab10').colors
colors = colors[:10]

# Plot the bar chart with custom colors
tag_counts[:10].plot(kind='bar', figsize=(10, 6), color=colors)
plt.show()
```

```
C:\Users\HP\AppData\Local\Temp\ipykernel_11812\3370316172.py:2: MatplotlibDeprecationWarning: The get_cmap function was deprecated in Matplotlib 3.7 and will be removed in 3.11. Use ``matplotlib.colormaps[name]`` or ``matplotlib.colormaps.get_cmap()`` or ``pyplot.get_cmap()`` instead.
  colors = plt.cm.get_cmap('tab10').colors
```



Row Filtering

In [66]:
```
highly_related=ratings['rating']>=5.0
ratings[highly_related][30:50]
```

Out[66]:

	userId	movieId	rating
239	3	50	5.0
242	3	175	5.0
244	3	223	5.0
245	3	260	5.0
246	3	316	5.0
247	3	318	5.0
248	3	329	5.0
252	3	457	5.0
253	3	480	5.0
254	3	490	5.0
256	3	541	5.0
258	3	593	5.0
263	3	858	5.0
264	3	904	5.0
267	3	924	5.0
268	3	953	5.0
271	3	1060	5.0
272	3	1073	5.0
275	3	1084	5.0
276	3	1089	5.0

In [67]:
```
action=movies['genres'].str.contains('Action')
movies[action][5:15]
```

Out[67]:

	movieId	title	genres
22	23	Assassins (1995)	Action|Crime|Thriller
41	42	Dead Presidents (1995)	Action|Crime|Drama
43	44	Mortal Kombat (1995)	Action|Adventure|Fantasy
50	51	Guardian Angel (1994)	Action|Drama|Thriller
65	66	Lawnmower Man 2: Beyond Cyberspace (1996)	Action|Sci-Fi|Thriller
69	70	From Dusk Till Dawn (1996)	Action|Comedy|Horror|Thriller
70	71	Fair Game (1995)	Action
75	76	Screamers (1995)	Action|Sci-Fi|Thriller
77	78	Crossing Guard, The (1995)	Action|Crime|Drama|Thriller
85	86	White Squall (1996)	Action|Adventure|Drama

In [68]:
```
movies[action].head(15)
```

Out[68]:

	movieId	title	genres
5	6	Heat (1995)	Action|Crime|Thriller
8	9	Sudden Death (1995)	Action
9	10	GoldenEye (1995)	Action|Adventure|Thriller
14	15	Cutthroat Island (1995)	Action|Adventure|Romance
19	20	Money Train (1995)	Action|Comedy|Crime|Drama|Thriller
22	23	Assassins (1995)	Action|Crime|Thriller
41	42	Dead Presidents (1995)	Action|Crime|Drama
43	44	Mortal Kombat (1995)	Action|Adventure|Fantasy
50	51	Guardian Angel (1994)	Action|Drama|Thriller
65	66	Lawnmower Man 2: Beyond Cyberspace (1996)	Action|Sci-Fi|Thriller
69	70	From Dusk Till Dawn (1996)	Action|Comedy|Horror|Thriller
70	71	Fair Game (1995)	Action
75	76	Screamers (1995)	Action|Sci-Fi|Thriller
77	78	Crossing Guard, The (1995)	Action|Crime|Drama|Thriller
85	86	White Squall (1996)	Action|Adventure|Drama

Group By and Aggregate

In [70]:
```
ratings_count = ratings[['movieId','rating']].groupby('rating').count()
ratings_count
```

Out[70]:

rating	movieId
0.5	239125
1.0	680732
1.5	279252
2.0	1430997
2.5	883398
3.0	4291193
3.5	2200156
4.0	5561926
4.5	1534824
5.0	2898660

In [71]:
```
average_rating=ratings[['movieId','rating']].groupby('movieId').count()
average_rating.head()
```

Out[71]:

movieId	rating
1	49695
2	22243
3	12735
4	2756
5	12161

In [72]:
```
average_rating=ratings[['movieId','rating']].groupby('movieId').mean()
average_rating.head()
```

Out[72]:

movieId	rating
1	3.921240
2	3.211977
3	3.151040
4	2.861393
5	3.064592

In [73]:
```
average_rating=ratings[['movieId','rating']].groupby('movieId').count()
average_rating.tail()
```

Out[73]:

	rating
movieId	
131254	1
131256	1
131258	1
131260	1
131262	1

Merge Dataframes

In [75]:
```
tags.head()
```

Out[75]:

	userId	movieId	tag
0	18	4141	Mark Waters
1	65	208	dark hero
2	65	353	dark hero
3	65	521	noir thriller
4	65	592	dark hero

In [76]:
```
movies.head()
```

Out[76]:

	movieId	title	genres
0	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy
1	2	Jumanji (1995)	Adventure|Children|Fantasy
2	3	Grumpier Old Men (1995)	Comedy|Romance
3	4	Waiting to Exhale (1995)	Comedy|Drama|Romance
4	5	Father of the Bride Part II (1995)	Comedy

In [77]:
```
a=movies.merge(tags, on='movieId', how='inner')
a.head()
```

Out[77]:

	movieId	title	genres	userId	tag
0	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1644	Watched
1	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1741	computer animation
2	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1741	Disney animated feature
3	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1741	Pixar animation
4	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1741	TÃ©a Leoni does not star in this movie

In [78]:
```
a=movies.merge(tags, on='movieId', how='outer') # it includes decimal values
a.head()
```

Out[78]:

	movieId	title	genres	userId	tag
0	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1644.0	Watched
1	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1741.0	computer animation
2	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1741.0	Disney animated feature
3	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1741.0	Pixar animation
4	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	1741.0	TÃ©a Leoni does not star in this movie

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]: