In [1]:

```
import pandas as pd
```

In [10]:

```
movies = pd.read_csv(r'C:\Users\DELL\Downloads\archive\movie.csv')
movies
```

Out[10]:

	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
...	...	...	...
27273	131254	Kein Bund für's Leben (2007)	Comedy
27274	131256	Feuer, Eis & Dosenbier (2002)	Comedy
27275	131258	The Pirates (2014)	Adventure
27276	131260	Rentun Ruusu (2001)	(no genres listed)
27277	131262	Innocence (2014)	Adventure|Fantasy|Horror

27278 rows × 3 columns

In [9]:

```
tags = pd.read_csv(r'C:\Users\DELL\Downloads\archive\tag.csv')
tags
```

Out[9]:

	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
...	...	...	...	...
465559	138446	55999	dragged	2013-01-23 23:29:32
465560	138446	55999	Jason Bateman	2013-01-23 23:29:38
465561	138446	55999	quirky	2013-01-23 23:29:38
465562	138446	55999	sad	2013-01-23 23:29:32
465563	138472	923	rise to power	2007-11-02 21:12:47

465564 rows × 4 columns

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

Out[8]:

	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
...	...	...	...	...
20000258	138493	68954	4.5	2009-11-13 15:42:00
20000259	138493	69526	4.5	2009-12-03 18:31:48
20000260	138493	69644	3.0	2009-12-07 18:10:57
20000261	138493	70286	5.0	2009-11-13 15:42:24
20000262	138493	71619	2.5	2009-10-17 20:25:36

20000263 rows × 4 columns

In [11]:
```
del ratings['timestamp']
```

In [12]:
```
del tags['timestamp']
```

In [13]:
```
row_0 = tags.iloc[0]
type(row_0)
```

Out[13]:
```
pandas.core.series.Series
```

In [14]:
```
print(row_0)
```

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

In [15]:
```
row_0.index
```

Out[15]:
```
Index(['userId', 'movieId', 'tag'], dtype='object')
```

In [16]:
```
row_0['userId']
```

Out[16]:
```
18
```

In [17]:
```
'rating' in row_0
```

Out[17]:
```
False
```

In [18]:
```
row_0.name
```

Out[18]:
```
0
```

In [19]:
```
row_0 = row_0.rename('firstRow')
row_0.name
```

Out[19]:
```
'firstRow'
```

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

In [24]:

```
ratings['rating'].describe()
```

Out[24]:

```
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 [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'].mean()
```

Out[26]:

```
3.5255285642993797
```

In [27]:

```
ratings.mean()
```

Out[27]:

```
userId     69045.872583
movieId     9041.567330
rating         3.525529
dtype: float64
```

In [28]:

```
ratings['rating'].min()
```

Out[28]:

```
0.5
```

In [29]:

```
ratings['rating'].max()
```

Out[29]:

```
5.0
```

In [30]:

```
ratings['rating'].std()
```

Out[30]:

```
1.051988919275684
```

In [31]:

```
ratings['rating'].mode()
```

Out[31]:

```
0    4.0
Name: rating, dtype: float64
```

In [32]:

```
ratings.corr()
```

Out[32]:

	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 [33]:

```
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[33]:

```
False
```

In [34]:

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

Out[34]:

```
True
```

In [35]:

```
movies.shape
```

Out[35]:

```
(27278, 3)
```

In [36]:

```
movies.isnull().any().any()
```

Out[36]:

```
False
```

In [37]:

```
ratings.shape
```

Out[37]:

```
(20000263, 3)
```

In [38]:

```
ratings.isnull().any().any()
```

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

```
In [39]: tags.shape
```

```
Out[39]:  (465564, 3)
```

```
In [40]: tags.isnull().any().any()
```

```
Out[40]:  True
```

```
In [41]: tags=tags.dropna()
```

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

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

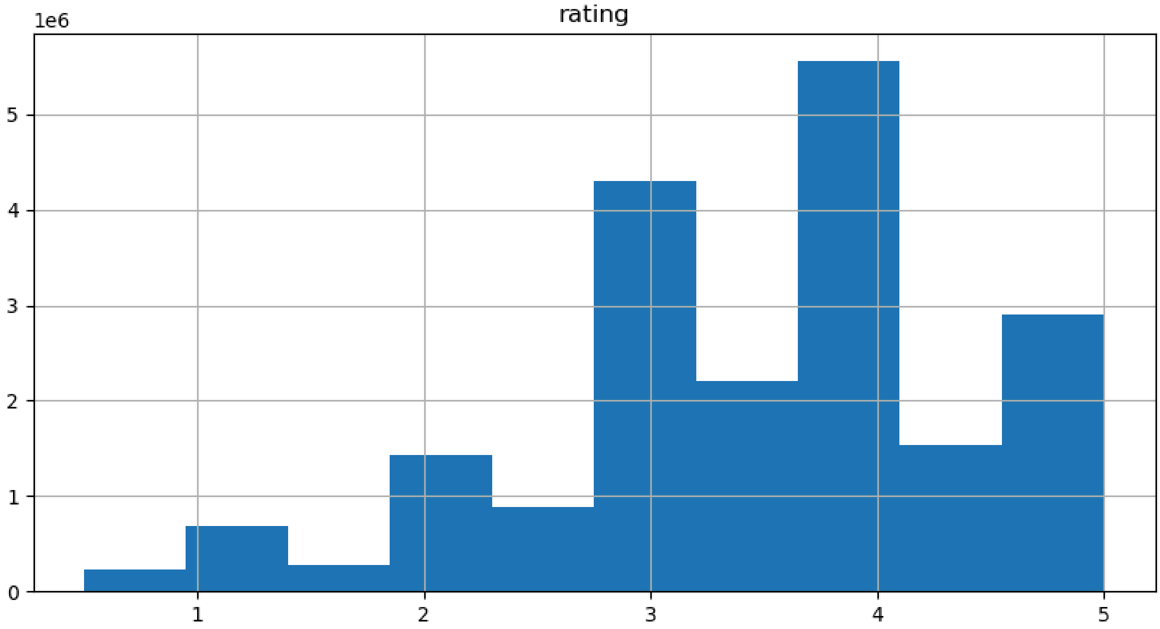
```
In [43]: tags.shape
```

```
Out[43]:  (465548, 3)
```

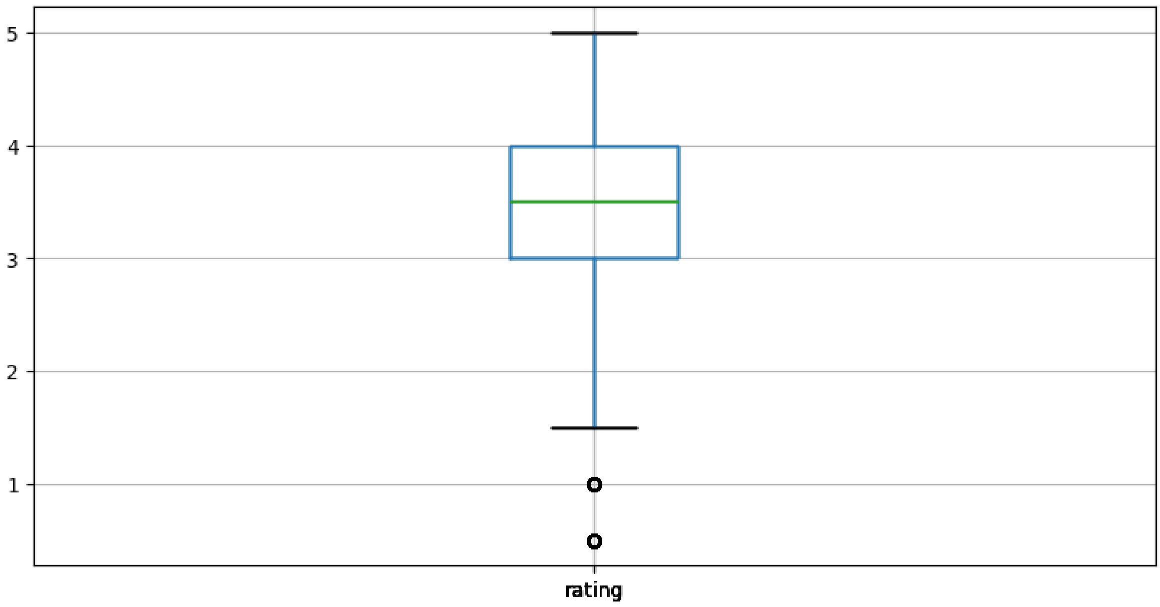
```
In [49]: import matplotlib.pyplot as plt
```

```
In [50]: %matplotlib inline

         ratings.hist(column='rating', figsize=(10,5))
         plt.show()
```



```
In [54]: ratings.boxplot(column='rating', figsize=(10,5))
         plt.show()
```



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

```
Out[55]: 0      Mark Waters
         1        dark hero
         2        dark hero
         3    noir thriller
         4        dark hero
         Name: tag, dtype: object
```

```
In [56]: movies[['title','genres']].head()
```

Out[56]:

	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 [57]: ratings[-10:]
```

Out[57]:

	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 [58]:

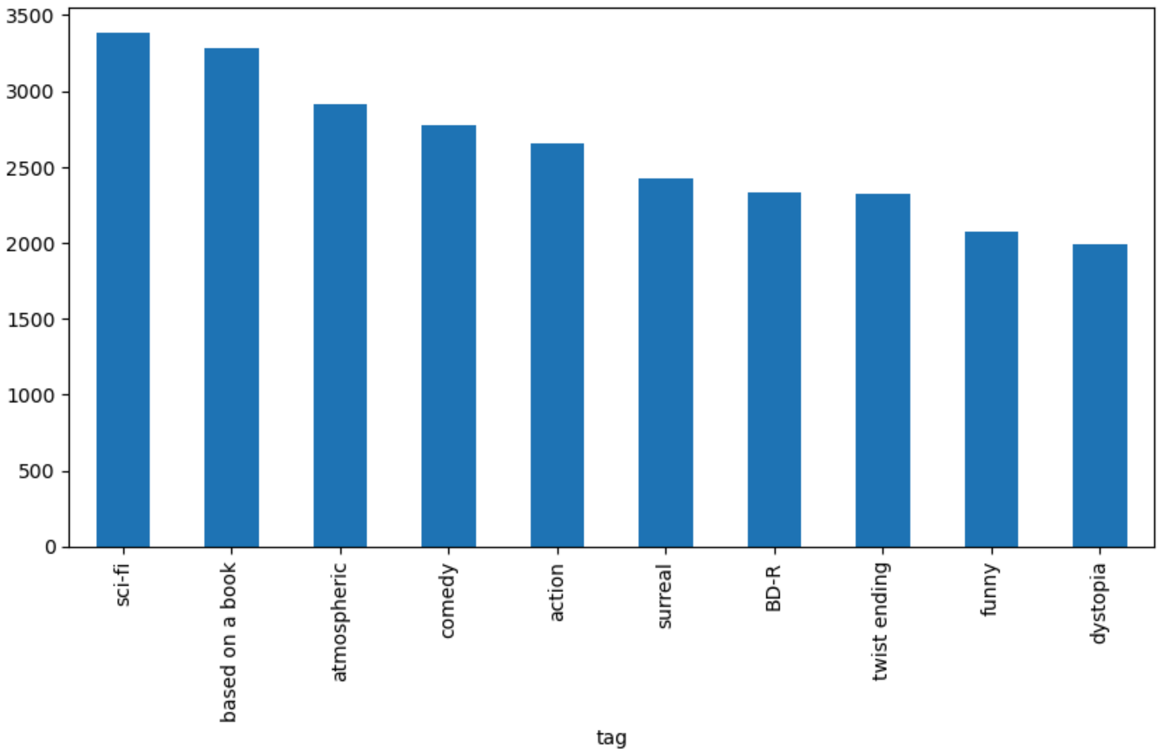
```
tag_counts = tags['tag'].value_counts()
tag_counts[-10:]
```

Out[58]:

```
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 [60]:

```
tag_counts[:10].plot(kind='bar', figsize=(10,5))
plt.show()
```



In [61]:

```
is_highly_rated = ratings['rating'] >= 5.0
ratings[is_highly_rated][30:50]
```

Out[61]:

	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 [62]:

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

Out[62]:

	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 [63]:

```python
movies[is_action].head(15)
```

Out[63]:

	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

In [64]:

```python
ratings_count = ratings[['movieId','rating']].groupby('rating').count()
ratings_count
```

Out[64]:

	movieId
rating	
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 [65]:

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

Out[65]:

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

In [66]:

```
movie_count = ratings[['movieId','rating']].groupby('movieId').count()
movie_count.head()
```

Out[66]:

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

In [67]:

```
movie_count = ratings[['movieId','rating']].groupby('movieId').count()
movie_count.tail()
```

Out[67]:

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

In [68]:
```
tags.head()
```

Out[68]:

	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 [69]:
```
movies.head()
```

Out[69]:

	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 [70]:
```
t = movies.merge(tags, on='movieId', how='inner')
t.head()
```

Out[70]:

	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 [71]:
```
avg_ratings= ratings.groupby('movieId', as_index=False).mean()
del avg_ratings['userId']
avg_ratings.head()
```

Out[71]:

	movieId	rating
0	1	3.921240
1	2	3.211977
2	3	3.151040
3	4	2.861393
4	5	3.064592

In [72]:
```
box_office = movies.merge(avg_ratings, on='movieId', how='inner')
box_office.tail()
```

Out[72]:

	movieId	title	genres	rating
26739	131254	Kein Bund für's Leben (2007)	Comedy	4.0
26740	131256	Feuer, Eis & Dosenbier (2002)	Comedy	4.0
26741	131258	The Pirates (2014)	Adventure	2.5
26742	131260	Rentun Ruusu (2001)	(no genres listed)	3.0
26743	131262	Innocence (2014)	Adventure|Fantasy|Horror	4.0

In [73]:
```
is_highly_rated = box_office['rating'] >= 4.0
box_office[is_highly_rated][-5:]
```

Out[73]:

	movieId	title	genres	rating
26737	131250	No More School (2000)	Comedy	4.0
26738	131252	Forklift Driver Klaus: The First Day on the Jo...	Comedy|Horror	4.0
26739	131254	Kein Bund für's Leben (2007)	Comedy	4.0
26740	131256	Feuer, Eis & Dosenbier (2002)	Comedy	4.0
26743	131262	Innocence (2014)	Adventure|Fantasy|Horror	4.0

In [74]:

```
is_Adventure = box_office['genres'].str.contains('Adventure')
box_office[is_Adventure][:5]
```

Out[74]:

	movieId	title	genres	rating
0	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy	3.921240
1	2	Jumanji (1995)	Adventure|Children|Fantasy	3.211977
7	8	Tom and Huck (1995)	Adventure|Children	3.142049
9	10	GoldenEye (1995)	Action|Adventure|Thriller	3.430029
12	13	Balto (1995)	Adventure|Animation|Children	3.272416

In [75]:

```
box_office[is_Adventure & is_highly_rated][-5:]
```

Out[75]:

	movieId	title	genres	rating
26611	130586	Itinerary of a Spoiled Child (1988)	Adventure|Drama	4.5
26655	130996	The Beautiful Story (1992)	Adventure|Drama|Fantasy	5.0
26667	131050	Stargate SG-1 Children of the Gods - Final Cut...	Adventure|Sci-Fi|Thriller	5.0
26736	131248	Brother Bear 2 (2006)	Adventure|Animation|Children|Comedy|Fantasy	4.0
26743	131262	Innocence (2014)	Adventure|Fantasy|Horror	4.0

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]:

```
movie_genres = movies['genres'].str.split('|', expand=True)
```

In [78]:

```
movie_genres[:10]
```

Out[78]:

	0	1	2	3	4	5	6	7	8	9
0	Adventure	Animation	Children	Comedy	Fantasy	None	None	None	None	None
1	Adventure	Children	Fantasy	None	None	None	None	None	None	None
2	Comedy	Romance	None	None	None	None	None	None	None	None
3	Comedy	Drama	Romance	None	None	None	None	None	None	None
4	Comedy	None	None	None	None	None	None	None	None	None
5	Action	Crime	Thriller	None	None	None	None	None	None	None
6	Comedy	Romance	None	None	None	None	None	None	None	None
7	Adventure	Children	None	None	None	None	None	None	None	None
8	Action	None	None	None	None	None	None	None	None	None
9	Action	Adventure	Thriller	None	None	None	None	None	None	None

In [79]:

```
movie_genres['isComedy'] = movies['genres'].str.contains('Comedy')
```

In [80]:

```
movie_genres[:10]
```

Out[80]:

	0	1	2	3	4	5	6	7	8	9
0	Adventure	Animation	Children	Comedy	Fantasy	None	None	None	None	None
1	Adventure	Children	Fantasy	None	None	None	None	None	None	None
2	Comedy	Romance	None	None	None	None	None	None	None	None
3	Comedy	Drama	Romance	None	None	None	None	None	None	None
4	Comedy	None	None	None	None	None	None	None	None	None
5	Action	Crime	Thriller	None	None	None	None	None	None	None
6	Comedy	Romance	None	None	None	None	None	None	None	None
7	Adventure	Children	None	None	None	None	None	None	None	None
8	Action	None	None	None	None	None	None	None	None	None
9	Action	Adventure	Thriller	None	None	None	None	None	None	None

In [81]:

```
movies['year'] = movies['title'].str.extract('.*\((.*)\).*', expand=True)
```

```
<>:1: SyntaxWarning: invalid escape sequence '\('
<>:1: SyntaxWarning: invalid escape sequence '\('
C:\Users\DELL\AppData\Local\Temp\ipykernel_496\702884181.py:1: SyntaxWarning: inv
alid escape sequence '\('
  movies['year'] = movies['title'].str.extract('.*\((.*)\).*', expand=True)
```

In [82]:

```
movies.tail()
```

Out[82]:

	movieId	title	genres	year
27273	131254	Kein Bund für's Leben (2007)	Comedy	2007
27274	131256	Feuer, Eis & Dosenbier (2002)	Comedy	2002
27275	131258	The Pirates (2014)	Adventure	2014
27276	131260	Rentun Ruusu (2001)	(no genres listed)	2001
27277	131262	Innocence (2014)	Adventure|Fantasy|Horror	2014

In [84]:

```
tags = pd.read_csv(r'C:\Users\DELL\Downloads\archive\tag.csv', sep=',')
```

In [85]:

```
tags.dtypes
```

Out[85]:

```
userId        int64
movieId       int64
tag          object
timestamp    object
dtype: object
```

In [86]:

```
tags.head(5)
```

Out[86]:

	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 [92]:

```
tags['parsed_time'] = pd.to_datetime(tags['timestamp'])
```

In [93]:

```
tags['parsed_time'].dtype
```

Out[93]:

```
dtype('<M8[ns]')
```

In [94]:

```
tags.head(2)
```

Out[94]:

	userId	movieId	tag	timestamp	parsed_time
0	18	4141	Mark Waters	2009-04-24 18:19:40	2009-04-24 18:19:40
1	65	208	dark hero	2013-05-10 01:41:18	2013-05-10 01:41:18

In [95]:

```
greater_than_t = tags['parsed_time'] > '2015-02-01'

selected_rows = tags[greater_than_t]

tags.shape, selected_rows.shape
```

Out[95]:

```
((465564, 5), (12130, 5))
```

In [96]:

```
tags.sort_values(by='parsed_time', ascending=True)[:10]
```

Out[96]:

	userId	movieId	tag	timestamp	parsed_time
333932	100371	2788	monty python	2005-12-24 13:00:10	2005-12-24 13:00:10
333927	100371	1732	coen brothers	2005-12-24 13:00:36	2005-12-24 13:00:36
333924	100371	1206	stanley kubrick	2005-12-24 13:00:48	2005-12-24 13:00:48
333923	100371	1193	jack nicholson	2005-12-24 13:02:51	2005-12-24 13:02:51
333939	100371	5004	peter sellers	2005-12-24 13:03:19	2005-12-24 13:03:19
333922	100371	47	morgan freeman	2005-12-24 13:03:32	2005-12-24 13:03:32
333921	100371	47	brad pitt	2005-12-24 13:03:32	2005-12-24 13:03:32
333936	100371	4011	brad pitt	2005-12-24 13:03:51	2005-12-24 13:03:51
333937	100371	4011	guy ritchie	2005-12-24 13:03:51	2005-12-24 13:03:51
333920	100371	32	bruce willis	2005-12-24 13:04:02	2005-12-24 13:04:02

In [97]:

```
average_rating = ratings[['movieId','rating']].groupby('movieId', as_index=False
average_rating.tail()
```

Out[97]:

	movieId	rating
26739	131254	4.0
26740	131256	4.0
26741	131258	2.5
26742	131260	3.0
26743	131262	4.0

In [102…

```
joined = movies.merge(average_rating, on='movieId', how='inner')
joined.head()
joined.select_dtypes(include='number').corr()
```

Out[102…

	movieId	rating
movieId	1.000000	-0.090369
rating	-0.090369	1.000000

In [ ]: