Data Visualisation on the MovieLens Dataset

In this storytelling and visualization project, I will visualize the data and show a few metrics from the movielens data set.

Source of data: MovieLens :: https://grouplens.org/datasets/movielens/ (https://grouplens.org/datasets/movielens/)

Let's get started!

Import Libraries

In [10]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
# Enable inline plotting
%matplotlib inline
```

Get the data

In [11]:

```
df1 = pd.read_csv('movies.csv')
df1.head()
```

Out[11]:

	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 [12]:

```
df2 = pd.read_csv('ratings.csv')
df2.head()
```

Out[12]:

	userId	movieId	rating	timestamp
0	1	1	4.0	964982703
1	1	3	4.0	964981247
2	1	6	4.0	964982224
3	1	47	5.0	964983815
4	1	50	5.0	964982931

In [13]:

```
df3 = pd.read_csv('tags.csv')
df3.head()
```

Out[13]:

	userId	movieId	tag	timestamp
0	2	60756	funny	1445714994
1	2	60756	Highly quotable	1445714996
2	2	60756	will ferrell	1445714992
3	2	89774	Boxing story	1445715207
4	2	89774	MMA	1445715200

Merge the data

Now that we have imported all the data sets, it is time that we merge them to form a larger and wider dataset with more related features

In [14]:

```
df4 = pd.merge(df2,df3,on=['userId','movieId'],how='left')
df = pd.merge(df4,df1,on=['movieId'],how='left')
df.head()
```

Out[14]:

	userId	movieId	rating	timestamp_x	tag	timestamp_y	title	
0	1	1	4.0	964982703	NaN	NaN	Toy Story (1995)	Adventure|Animation|(
1	1	3	4.0	964981247	NaN	NaN	Grumpier Old Men (1995)	
2	1	6	4.0	964982224	NaN	NaN	Heat (1995)	
3	1	47	5.0	964983815	NaN	NaN	Seven (a.k.a. Se7en) (1995)	
4	1	50	5.0	964982931	NaN	NaN	Usual Suspects, The (1995)	

Exploratory Data Analysis

Let's take a look at some of the best rated movies.

In [15]:

```
import matplotlib.pyplot as plt
import seaborn as sns
sns.set_style('white')
%matplotlib inline
```

In [16]:

```
df.groupby('title')['rating'].mean().sort_values(ascending=False).head()
```

Out[16]:

```
title
I'm the One That I Want (2000)            5.0
Vacations in Prostokvashino (1980)        5.0
My Love (2006)                            5.0
Cherish (2002)                            5.0
Paper Birds (Pájaros de papel) (2010)     5.0
Name: rating, dtype: float64
```

In [17]:

```
df.groupby('title')['rating'].count().sort_values(ascending=False).
head()
```

Out[17]:

```
title
Pulp Fiction (1994)                    484
Forrest Gump (1994)                    335
Shawshank Redemption, The (1994)       319
Silence of the Lambs, The (1991)       283
Matrix, The (1999)                     280
Name: rating, dtype: int64
```

In [18]:

```
ratings = pd.DataFrame(df.groupby('title')['rating'].mean())
ratings.head()
```

Out[18]:

	rating
title	
'71 (2014)	4.0
'Hellboy': The Seeds of Creation (2004)	4.0
'Round Midnight (1986)	3.5
'Salem's Lot (2004)	5.0
'Til There Was You (1997)	4.0

New 'Number of Ratings' Column

In [19]:

```
ratings['num of ratings'] = pd.DataFrame(df.groupby('title')['ratin
g'].count())
ratings.sort_values(['num of ratings','rating'],ascending=False).he
ad(5)
```

Out[19]:

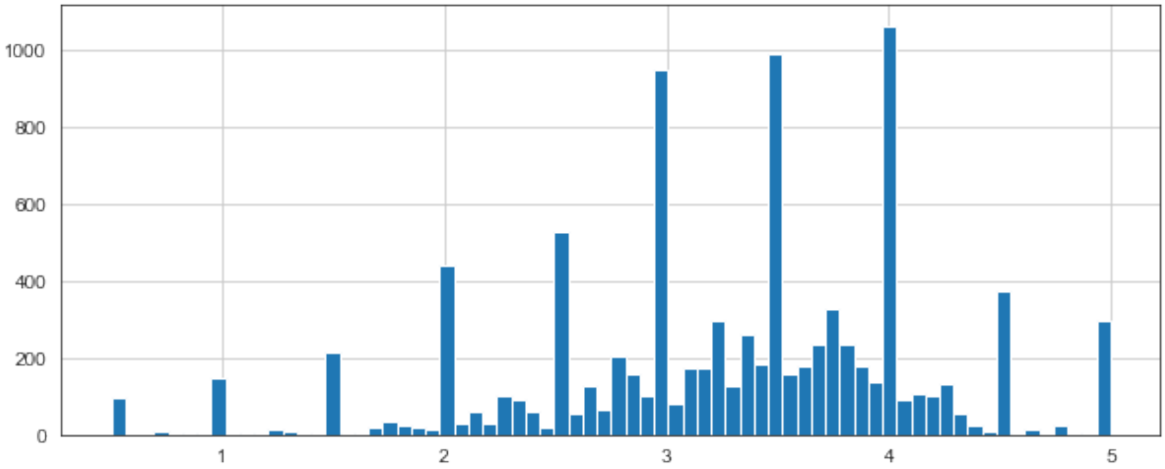
	rating	num of ratings
title		
Pulp Fiction (1994)	4.487603	484
Forrest Gump (1994)	4.155224	335
Shawshank Redemption, The (1994)	4.432602	319
Silence of the Lambs, The (1991)	4.173145	283
Matrix, The (1999)	4.183929	280

Getting more insights about the ratings

Plot the average ratings frequency

```
In [60]: plt.figure(figsize=(10,4))
         ratings['rating'].hist(bins=70)

Out[60]: <matplotlib.axes._subplots.AxesSubplot at 0x1a2b420390>
```



Are the most popular movies the most highly rated?

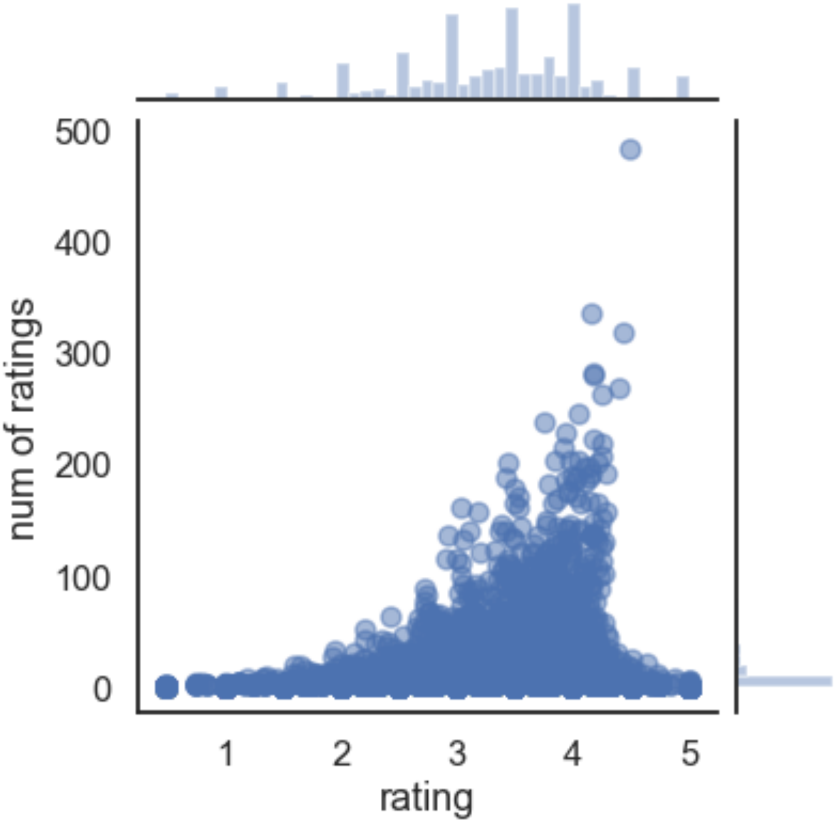
Are the most highly rated also the most popular ones?

We can answer this by the following plt:

Number of Ratings vs Ratings plotting

```
In [40]: sns.jointplot(x='rating',y='num of ratings',data=ratings,alpha=0.5)
```

```
Out[40]: <seaborn.axisgrid.JointGrid at 0x1185b1ba8>
```



Visualise the number of movies which belong to each genre

STEP1: Get the frequency of the keywords from the 'genres' feature

In [28]:
```
def count_word(df, ref_col, liste):
    keyword_count = dict()
    for s in liste: keyword_count[s] = 0
    for liste_keywords in df[ref_col].str.split('|'):
        if type(liste_keywords) == float and pd.isnull(liste_keywords): continue
        for s in liste_keywords:
            if pd.notnull(s): keyword_count[s] += 1
    keyword_occurences = []
    for k,v in keyword_count.items():
        keyword_occurences.append([k,v])
    keyword_occurences.sort(key = lambda x:x[1], reverse = True)
    return keyword_occurences, keyword_count
```

STEP 2: Create a census of genre keywords

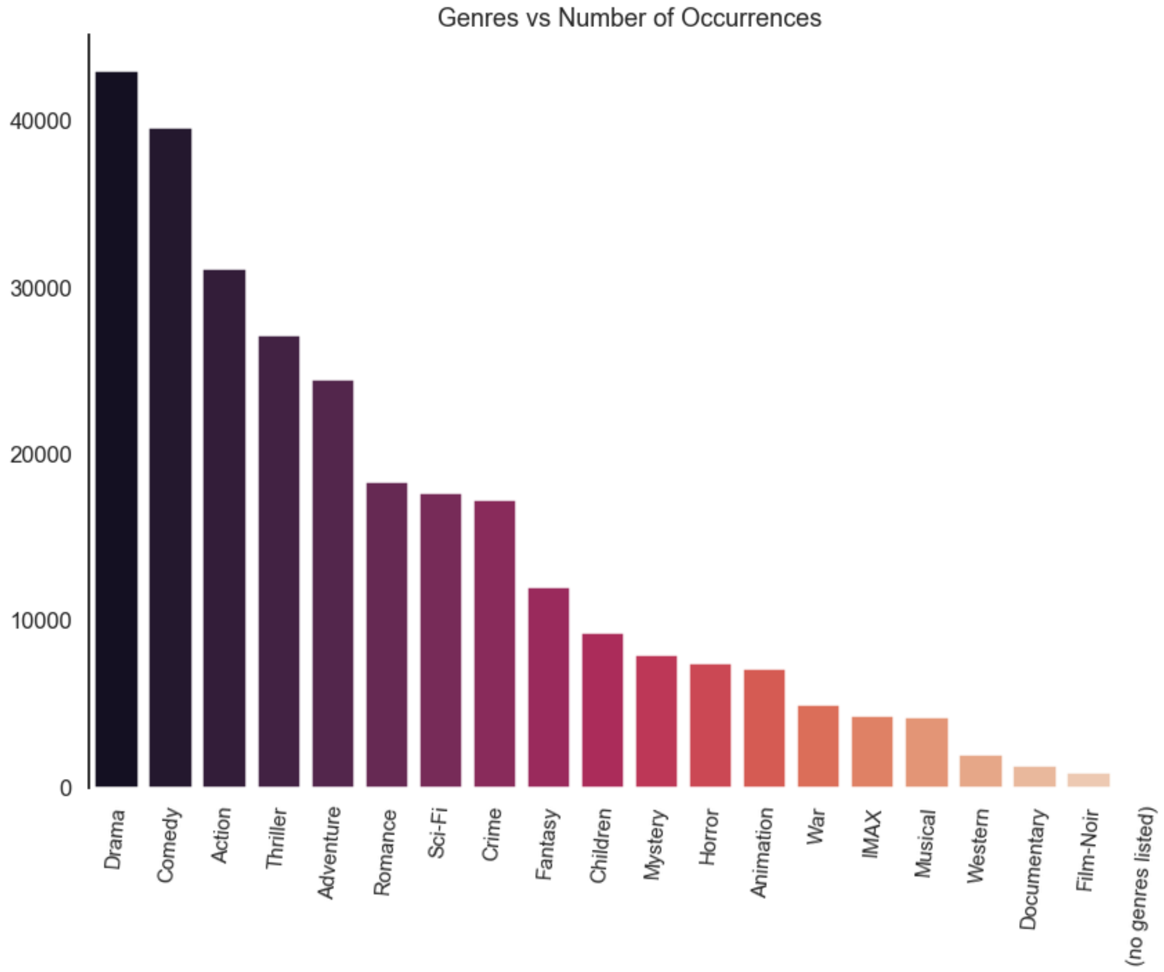
In [34]:
```
genre_labels = set()
for s in df['genres'].str.split('|').values:
    genre_labels = genre_labels.union(set(s))
```

STEP 3: Counting the frequency of many times each of the genres occur:

In [31]:
```
keyword_occurences, dum = count_word(df, 'genres', genre_labels)
```

In [35]:

```
x_axis=[]
y_axis=[]
fig = plt.figure(1, figsize=(14,10))
plt.xticks(rotation=85, fontsize = 15)
sns.set(style="white", context="talk")
for (key,cnt) in keyword_occurences:
    x_axis.append(key)
    y_axis.append(cnt)
sns.barplot(x_axis,y_axis, palette="rocket")
plt.title("Genres vs Number of Occurrences")
sns.despine(bottom=True)
```



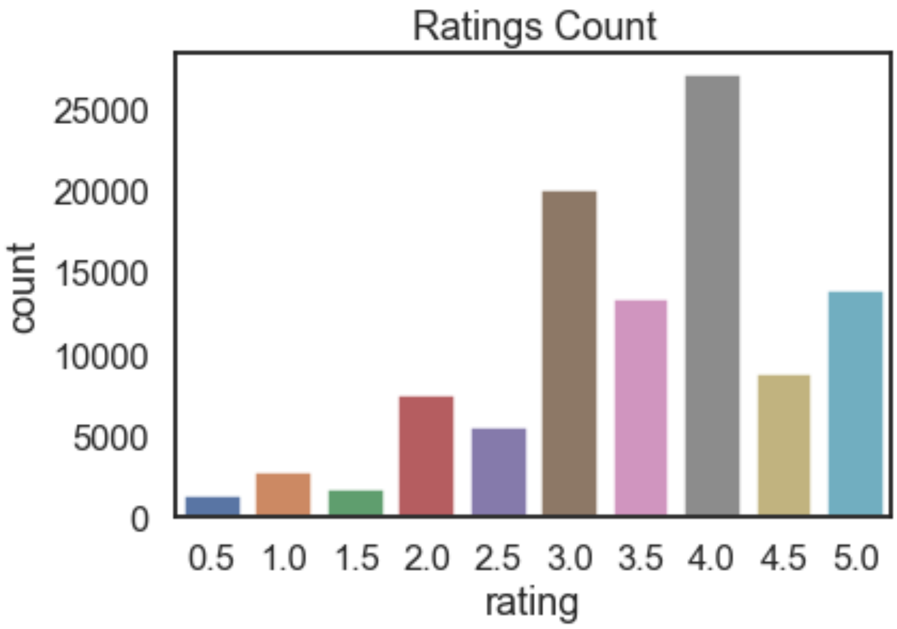
There are 10 different ratings possible (0, .5, 1, 1.5, 2, 2.5, 3......5). Can we tell the count of each rating from dataset?

In [38]:
```
tempDF = df
for (key,cnt) in keyword_occurences:
    tempDF.loc[tempDF['genres'].str.contains(key), key] = 1
    tempDF[key] = tempDF[key].fillna(0)

tempDF['tag'] = tempDF['tag'].fillna('')
plt.title("Ratings Count")
sns.countplot(x=tempDF.rating,data=tempDF)
```

```
/anaconda3/lib/python3.7/site-packages/ipykernel_launcher.py:7: Us
erWarning: This pattern has match groups. To actually get the grou
ps, use str.extract.
  import sys
```

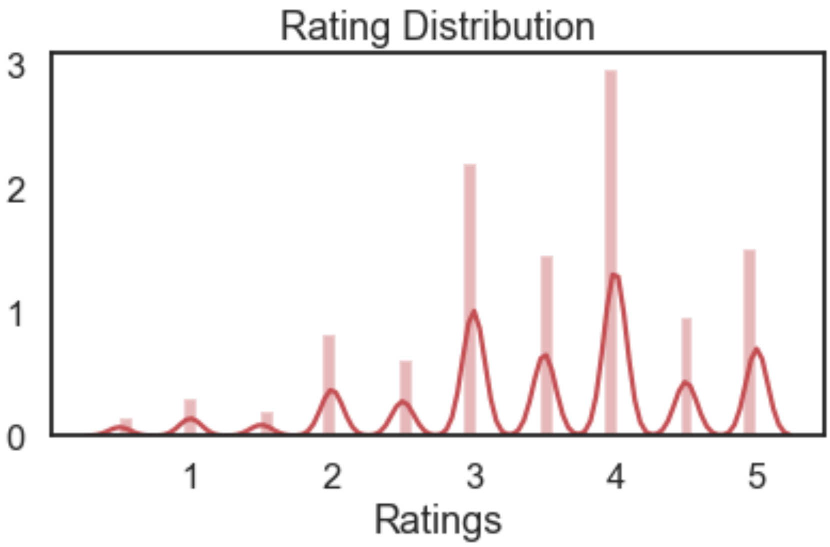
Out[38]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1fb90a90>
```



Plot the density estimate for ratings

In [44]:

```
sns.despine(left=True)
sns.distplot(tempDF.rating, color="r")
plt.xlabel('Ratings')
plt.title('Rating Distribution')
plt.tight_layout()
```



WordCloud

Word cloud is a visual representation of text data where the importance/occurence of each word is depicted by the font size.

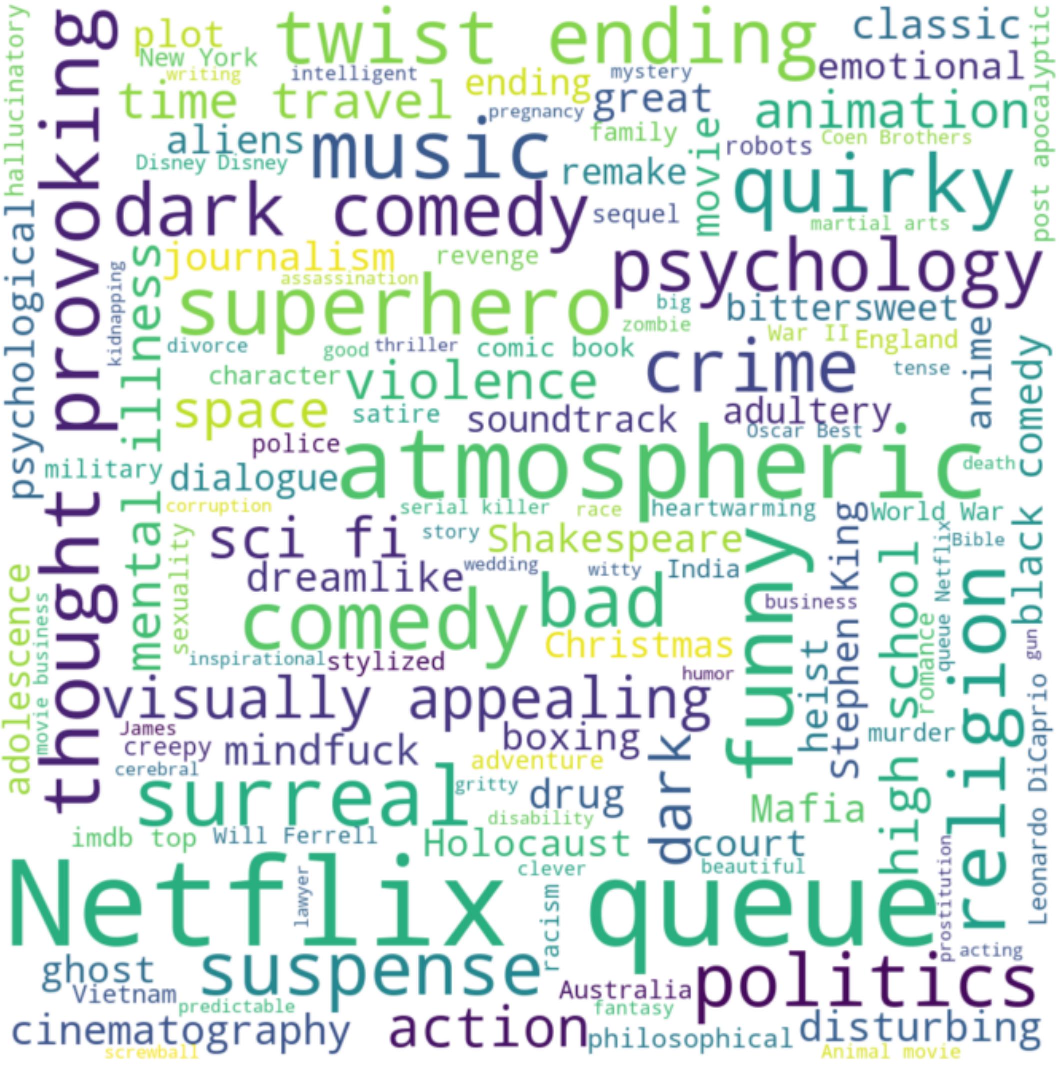
In [56]:

```
# Create Text From tags
text = ''
for index, row in tempDF.iterrows():
   text = text+'  '+row['tag']
from wordcloud import WordCloud, STOPWORDS
stopwords = set(STOPWORDS)
wordcloud = WordCloud(width = 1000, height = 1000,
                background_color ='white',
                stopwords = stopwords,
                min_font_size = 15).generate(text)
```

Plot the WordCloud image

In [59]:

```
plt.figure(figsize = (10, 10), facecolor=None)
plt.imshow(wordcloud,interpolation='bilinear')
plt.axis("off")
plt.tight_layout(pad = 0)
plt.show()
```



In [ ]:

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