te-webscraping-using-beautifulsoup

January 28, 2024

IMDB Website Webscraping using Beautifulsoup - Giriraju B, Data Analyst

```
[114]: !pip install requests
       !pip install beautifulsoup4
```

```
Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-
packages (2.31.0)
Requirement already satisfied: charset-normalizer<4,>=2 in
/usr/local/lib/python3.10/dist-packages (from requests) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-
packages (from requests) (3.6)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/usr/local/lib/python3.10/dist-packages (from requests) (2.0.7)
Requirement already satisfied: certifi>=2017.4.17 in
/usr/local/lib/python3.10/dist-packages (from requests) (2023.11.17)
Requirement already satisfied: beautifulsoup4 in /usr/local/lib/python3.10/dist-
packages (4.11.2)
Requirement already satisfied: soupsieve>1.2 in /usr/local/lib/python3.10/dist-
packages (from beautifulsoup4) (2.5)
```

Importing required libraries

```
[115]: import requests
       from bs4 import BeautifulSoup
       import numpy as np
       import pandas as pd
```

Giving Headers and the website url to scrape

```
[116]: headers = {
           'User-Agent': 'Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36␣
         ↪(KHTML, like Gecko) Chrome/116.0.0.0 Safari/537.36',
           'Accept-Language': 'en-US,en;q=0.5'
       }

       url = "https://www.imdb.com/chart/top"
```

Getting requests for web scraping (legal policies)

[117]:
```
response = requests.get(url, headers=headers)
soup = BeautifulSoup(response.content, 'html.parser')
```

Creating dummy arrays where we gonna scrape the data & store

[118]:
```
Rank = []
movie_names = []
Released_year = []
Duration = []
Rating = []
Rating_type = []
Votes = []
```

Finding the main class to start web scrape

[119]:
```
movies = soup.findAll('div',attrs={'class':'ipc-metadata-list-summary-item__c'})
```

Webscraping Process

[120]:
```
for data in movies:

    parts = data.a.text.split('.', 1)
    movie_rank = parts[0].strip()
    movie_name = parts[1].strip()

    Rank.append(movie_rank)
    movie_names.append(movie_name)

    year = data.find('span', class_= 'sc-1e00898e-8 hsHAHC␣
↪cli-title-metadata-item').text.replace('(','').replace(')','')
    Released_year.append(year)

    runtime = data.find('span', class_= 'sc-1e00898e-8 hsHAHC␣
↪cli-title-metadata-item').find_next('span').text
    Duration.append(runtime)

    rating = data.find('span', class_= 'ipc-rating-star ipc-rating-star--base␣
↪ipc-rating-star--imdb ratingGroup--imdb-rating').text.split()[0]
    Rating.append(rating)

    rating_type = data.find('span', class_= 'sc-1e00898e-8 hsHAHC␣
↪cli-title-metadata-item').find_next('span').find_next('span').text
    Rating_type.append(rating_type)

    votes = data.find('span', class_= 'ipc-rating-star ipc-rating-star--base␣
↪ipc-rating-star--imdb ratingGroup--imdb-rating').text.split()[1].
↪replace('(','').replace(')','')
    Votes.append(votes)
```

Creating Dataframe (as table)

[121]:
```python
df = pd.DataFrame({
    'Rank': Rank,
    'Movie Name': movie_names,
    'Duration': Duration,
    'Released year': Released_year,
    'Rating': Rating,
    'Rated type': Rating_type,
    'Votes': Votes
})
```

Converting Duration & Votes columns to single unit for analysing

[122]:
```python
df['Duration'] = df['Duration'].apply(convert_to_minutes)
df['Votes'] = df['Votes'].apply(convert_viewer_count)
```

[123]:
```python
print(df)
```

```
    Rank                Movie Name  Duration Released year Rating Rated type  \
0      1  The Shawshank Redemption       142          1994    9.3          R
1      2             The Godfather       175          1972    9.2          R
2      3           The Dark Knight       152          2008    9.0      PG-13
3      4     The Godfather Part II       202          1974    9.0          R
4      5              12 Angry Men        96          1957    9.0   Approved
..   …                         …       …            …      …        …
245  246                  The Help       146          2011    8.1      PG-13
246  247     It Happened One Night       105          1934    8.1     Passed
247  248            The 400 Blows        99          1959    8.1  Not Rated
248  249                  Drishyam       163          2015    8.2  Not Rated
249  250        Gangs of Wasseypur       321          2012    8.2  Not Rated

       Votes
0    2900000
1    2000000
2    2800000
3    1300000
4     851000
..       …
245   487000
246   111000
247   127000
248    93000
249   103000

[250 rows x 7 columns]
```

Export the dataset as excel for Analysing in PowerBI

[124]:
```
excel_file_path = 'IMDB_TOP_250_movies.xlsx'

df.to_excel(excel_file_path, index=False)

print(f'DataFrame exported to {excel_file_path}')
```

```
DataFrame exported to IMDB_TOP_250_movies.xlsx
```

—-> **Analysis with python**

[125]:
```
df.head()
```

[125]:
```
  Rank                Movie Name  Duration Released year Rating Rated type  \
0    1  The Shawshank Redemption       142          1994    9.3          R
1    2             The Godfather       175          1972    9.2          R
2    3           The Dark Knight       152          2008    9.0      PG-13
3    4    The Godfather Part II        202          1974    9.0          R
4    5              12 Angry Men        96          1957    9.0   Approved

     Votes
0  2900000
1  2000000
2  2800000
3  1300000
4   851000
```

[126]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 250 entries, 0 to 249
Data columns (total 7 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   Rank           250 non-null    object
 1   Movie Name     250 non-null    object
 2   Duration       250 non-null    int64
 3   Released year  250 non-null    object
 4   Rating         250 non-null    object
 5   Rated type     250 non-null    object
 6   Votes          250 non-null    int64
dtypes: int64(2), object(5)
memory usage: 13.8+ KB
```

There is no blank row or cell, we are good to go !!

[156]:
```
Total_movies = df['Movie Name'].count()
print("Total movies in the dataset are",Total_movies )
```

```
Total movies in the dataset are 250
```

```
[158]: Rating_count = df['Rating'].nunique()
       print("Total ratings in the dataset are",Rating_count )
```

```
Total movies in the dataset are 13
```

```
[160]: Rating_type = df['Rated type'].nunique()
       print("Total ratings type in the dataset are",Rating_type)
```

```
Total ratings type in the dataset are 15
```

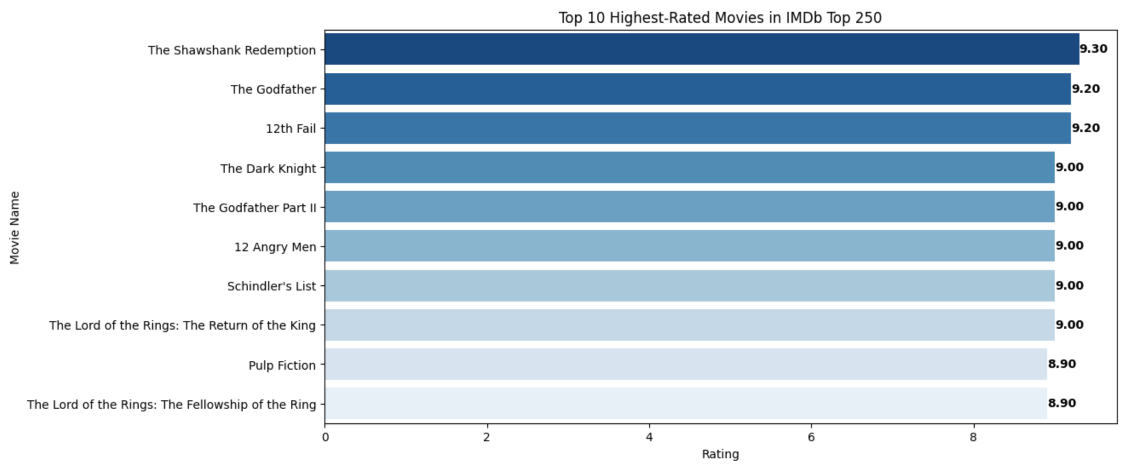
Immporting visualisation libraries

```
[127]: import seaborn as sns
       import matplotlib.pyplot as plt
```

1. Top 10 Highest Rated Movies

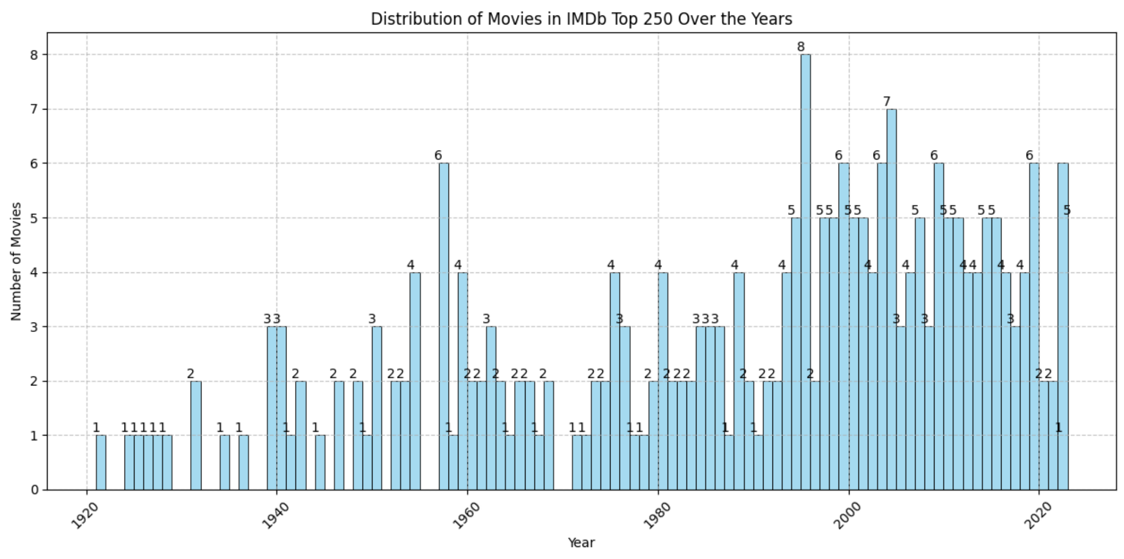
```
[128]: df['Rating'] = pd.to_numeric(df['Rating'], errors='coerce')

       top_10_movies = df.nlargest(10, 'Rating')

       plt.figure(figsize=(12, 6))
       ax = sns.barplot(x='Rating', y='Movie Name', data=top_10_movies,␣
        ↪palette='Blues_r')

       for index, value in enumerate(top_10_movies['Rating']):
           ax.text(value, index, f'{value:.2f}', ha='left', va='center',␣
        ↪color='black', fontweight='bold')

       plt.title('Top 10 Highest-Rated Movies in IMDb Top 250')
       plt.xlabel('Rating')
       plt.ylabel('Movie Name')
       plt.show()
```

```
<ipython-input-128-a6d32e1e1f3a>:6: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in
v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same
effect.

  ax = sns.barplot(x='Rating', y='Movie Name', data=top_10_movies,
palette='Blues_r')
```



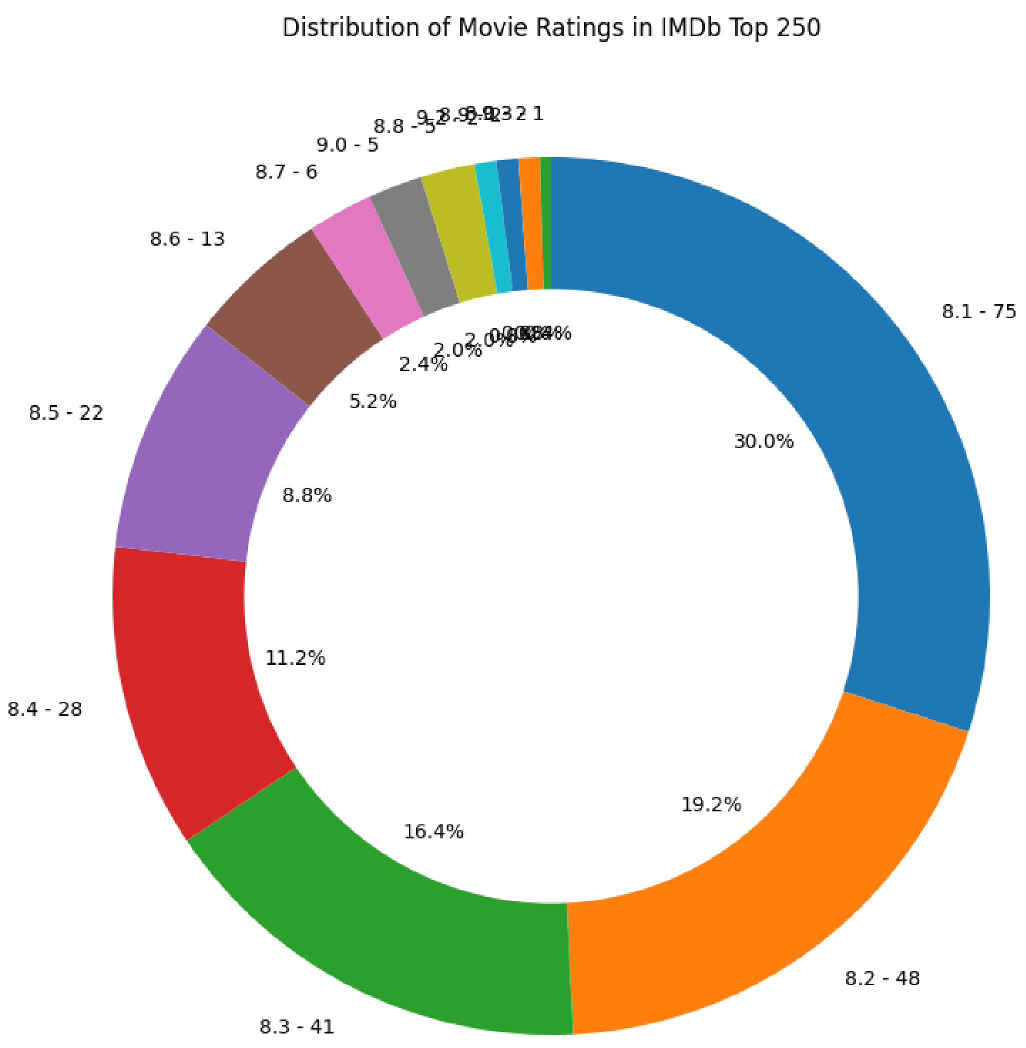
2. Number of movies over the years

```
[129]: df['Released year'] = pd.to_numeric(df['Released year'], errors='coerce')

movies_per_year = df.groupby('Released year').size().reset_index(name='Number␣
 ↪of Movies')

plt.figure(figsize=(12, 6))
sns.histplot(x='Released year', data=df, bins=range(int(df['Released year'].
 ↪min()), int(df['Released year'].max()) + 1), color='skyblue',␣
 ↪edgecolor='black')

for index, value in movies_per_year.iterrows():
    plt.text(value['Released year'], value['Number of Movies'],␣
 ↪str(value['Number of Movies']), ha='center', va='bottom')

plt.title('Distribution of Movies in IMDb Top 250 Over the Years')
plt.xlabel('Year')
plt.ylabel('Number of Movies')
plt.xticks(rotation=45)
plt.grid(True, linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()
```



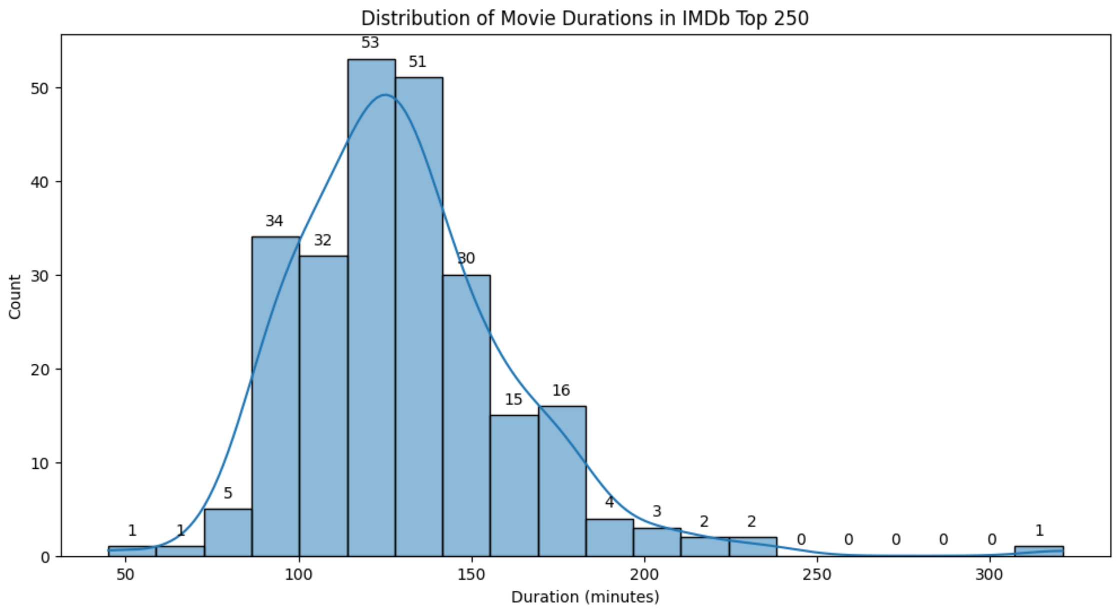
3. Distribution of movie ratings

[137]:
```
plt.figure(figsize=(15, 10))
labels = ['{} - {}'.format(round(val, 1), count) for val, count in␣
 ↪zip(df['Rating'].value_counts().index, df['Rating'].value_counts())]
plt.pie(df['Rating'].value_counts(), labels=labels, autopct='%1.1f%%',␣
 ↪startangle=90, wedgeprops=dict(width=0.4), counterclock=False)

centre_circle = plt.Circle((0, 0), 0.70, fc='white')
fig = plt.gcf()
fig.gca().add_artist(centre_circle)

plt.title('Distribution of Movie Ratings in IMDb Top 250')
plt.show()
```



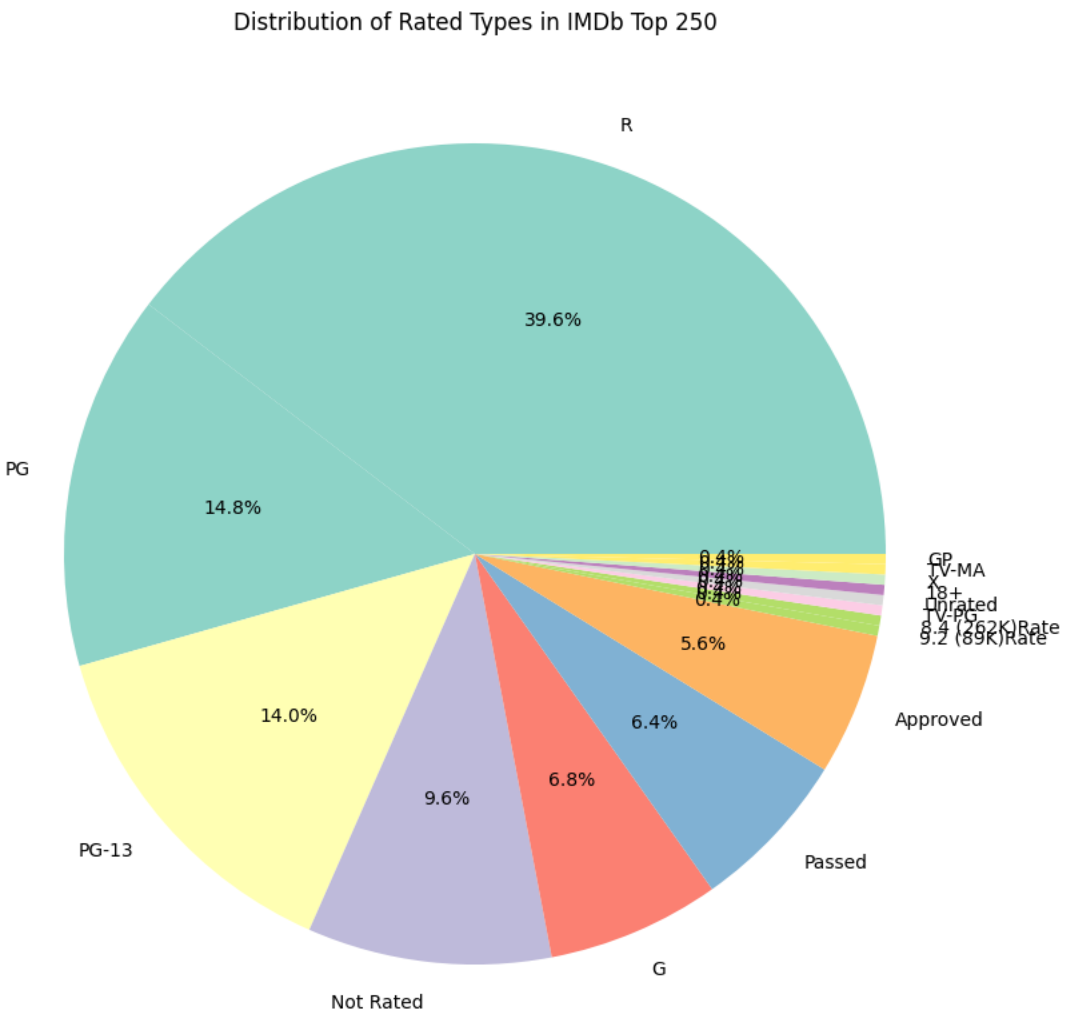
4. Distribution of Movie Duration in IMDB Top 250

```
[138]: plt.figure(figsize=(12, 6))
ax = sns.histplot(df['Duration'], bins=20, kde=True)

for rect in ax.patches:
    height = rect.get_height()
    ax.annotate(f'{height}', xy=(rect.get_x() + rect.get_width() / 2, height),
                xytext=(0, 5), textcoords='offset points',
                ha='center', va='bottom')

plt.title('Distribution of Movie Durations in IMDb Top 250')
plt.xlabel('Duration (minutes)')
plt.ylabel('Count')
plt.show()
```



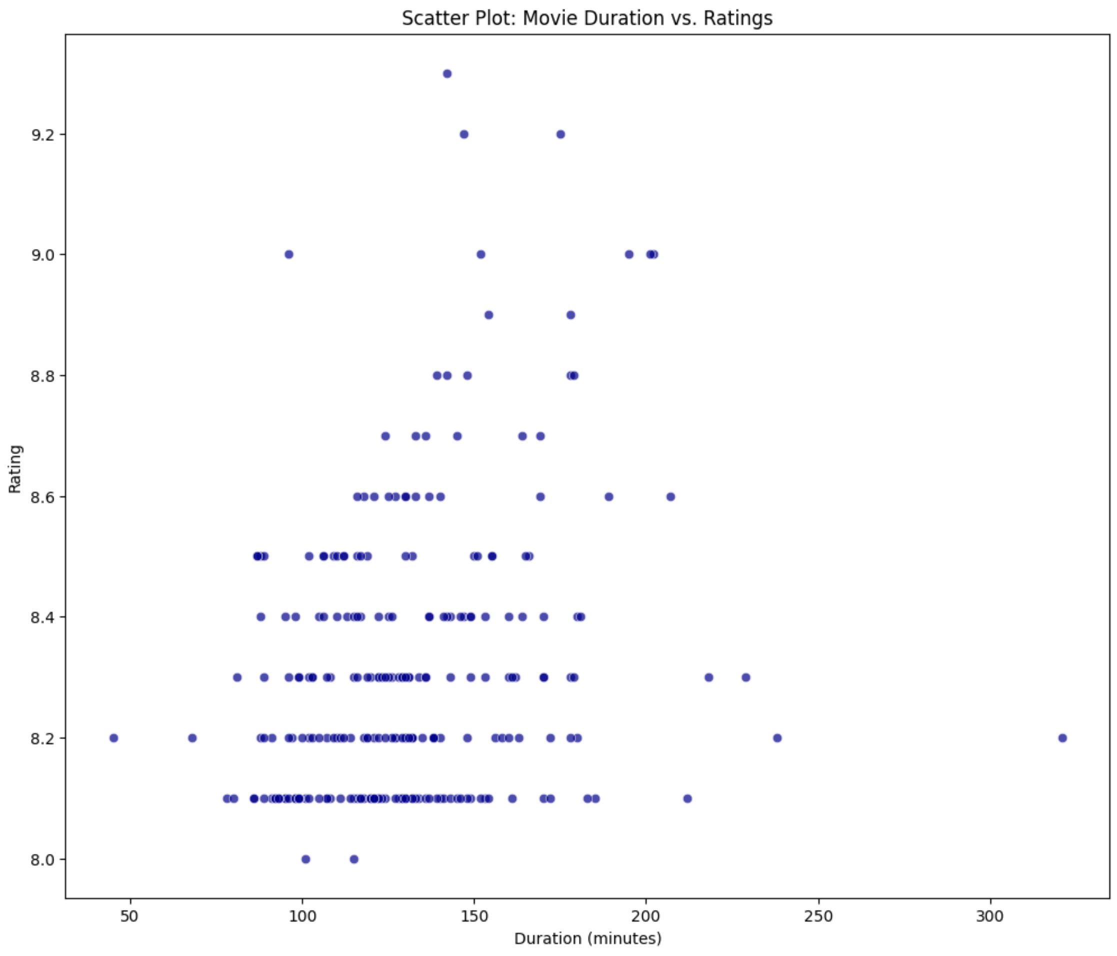
5. Distribution of Rated Types in IMDb Top 250

```
[139]: plt.figure(figsize=(12, 10))
df['Rated type'].value_counts().plot(kind='pie', autopct='%1.1f%%', cmap='Set3')
plt.title('Distribution of Rated Types in IMDb Top 250')
plt.ylabel('')
plt.show()
```



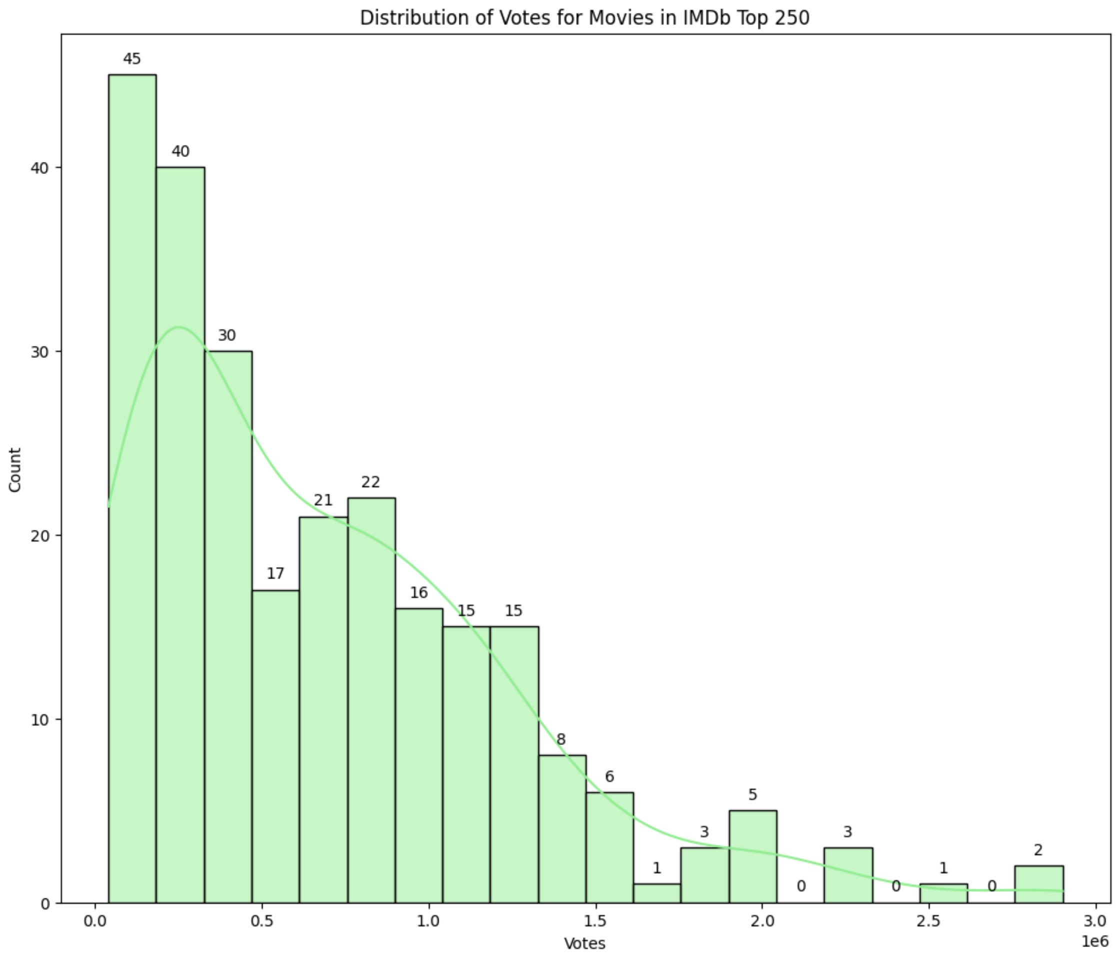
6. Correlations between movie duration and Ratings

[140]:
```
plt.figure(figsize=(12, 10))
sns.scatterplot(x='Duration', y='Rating', data=df, color='darkblue', alpha=0.7)
plt.title('Scatter Plot: Movie Duration vs. Ratings')
plt.xlabel('Duration (minutes)')
plt.ylabel('Rating')
plt.show()
```



7. Distribution of Votes for Movies

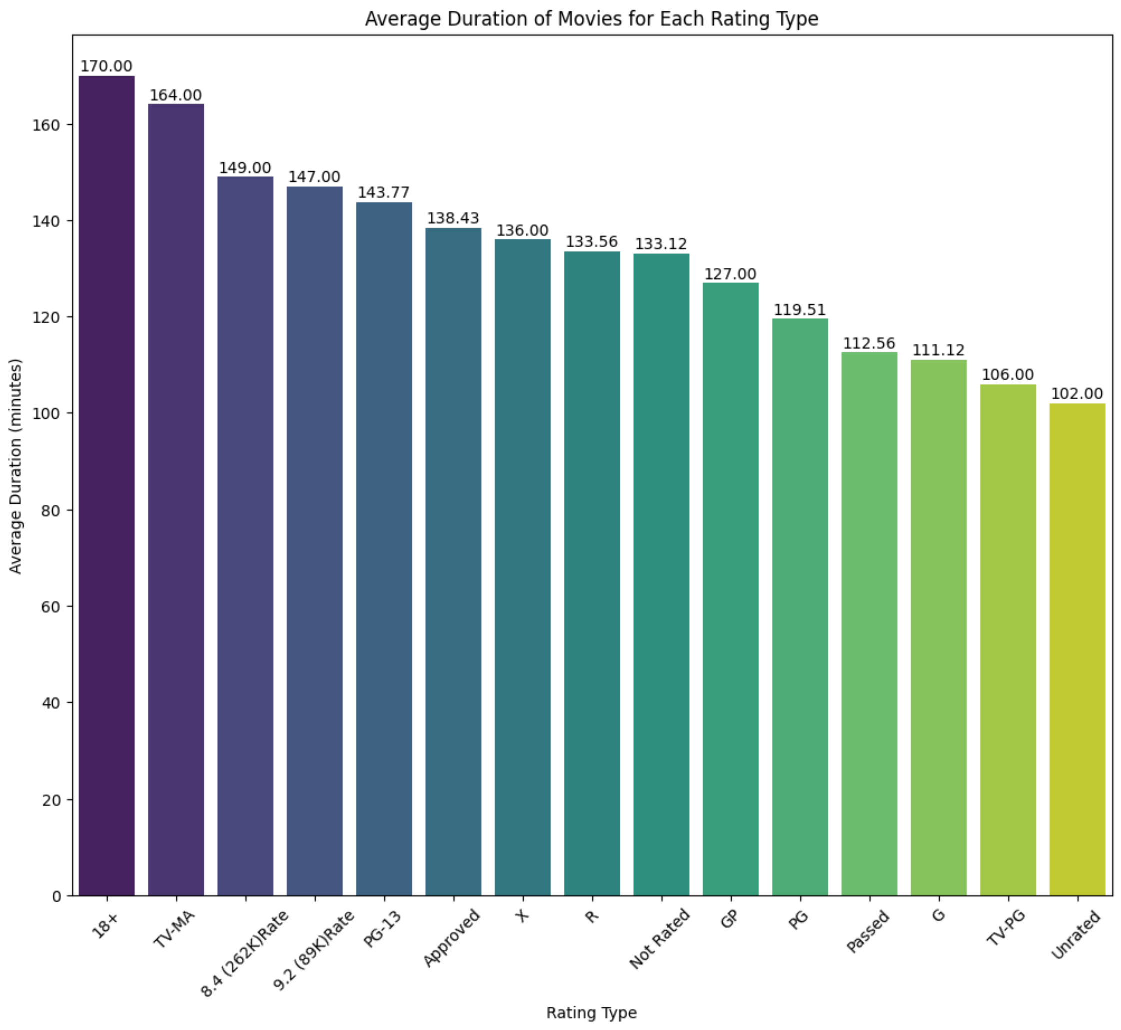
[141]:
```
plt.figure(figsize=(12, 10))
ax = sns.histplot(df['Votes'], bins=20, color='lightgreen', kde=True)

for rect in ax.patches:
    height = rect.get_height()
    ax.annotate(f'{int(height)}', xy=(rect.get_x() + rect.get_width() / 2,␣
 ↪height),
                xytext=(0, 5), textcoords='offset points',
                ha='center', va='bottom')

plt.title('Distribution of Votes for Movies in IMDb Top 250')
plt.xlabel('Votes')
plt.ylabel('Count')
plt.show()
```



8. Average Duration of Movies for Each Rating Type

[145]:
```
avg_duration_by_rating = df.groupby('Rated type')['Duration'].mean().
 ↪sort_values(ascending=False)

plt.figure(figsize=(12, 10))
ax = sns.barplot(x=avg_duration_by_rating.index, y=avg_duration_by_rating.
 ↪values, palette='viridis')

for i, v in enumerate(avg_duration_by_rating.values):
    ax.text(i, v + 0.2, f'{v:.2f}', ha='center', va='bottom')

plt.title('Average Duration of Movies for Each Rating Type')
plt.xlabel('Rating Type')
plt.ylabel('Average Duration (minutes)')
plt.xticks(rotation=45)
plt.show()
```

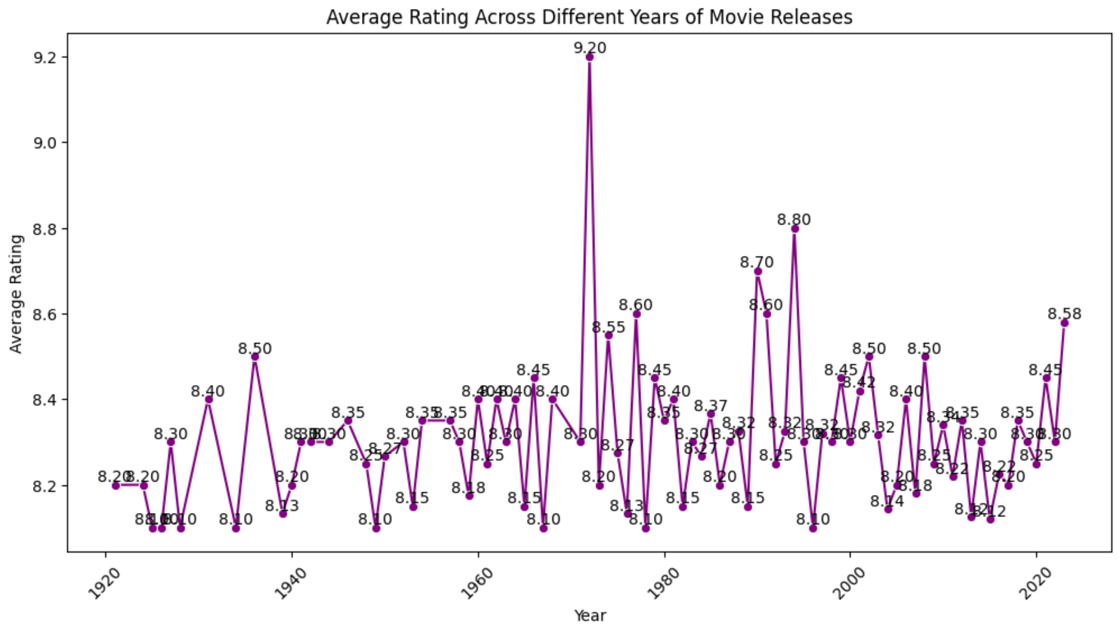
```
<ipython-input-145-23fedd01a4eb>:4: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in
v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same
effect.

  ax = sns.barplot(x=avg_duration_by_rating.index,
y=avg_duration_by_rating.values, palette='viridis')
```



9. Average Rating Across Different Years of Movie Releases

```
[148]: df['Released year'] = pd.to_numeric(df['Released year'], errors='coerce')
avg_rating_by_year = df.groupby('Released year')['Rating'].mean()

plt.figure(figsize=(12, 6))
```

```
ax = sns.lineplot(x=avg_rating_by_year.index, y=avg_rating_by_year.values,␣
 ↪marker='o', color='purple')

for x, y in zip(avg_rating_by_year.index, avg_rating_by_year.values):
    ax.text(x, y, f'{y:.2f}', ha='center', va='bottom')

plt.title('Average Rating Across Different Years of Movie Releases')
plt.xlabel('Year')
plt.ylabel('Average Rating')
plt.xticks(rotation=45)
plt.show()
```

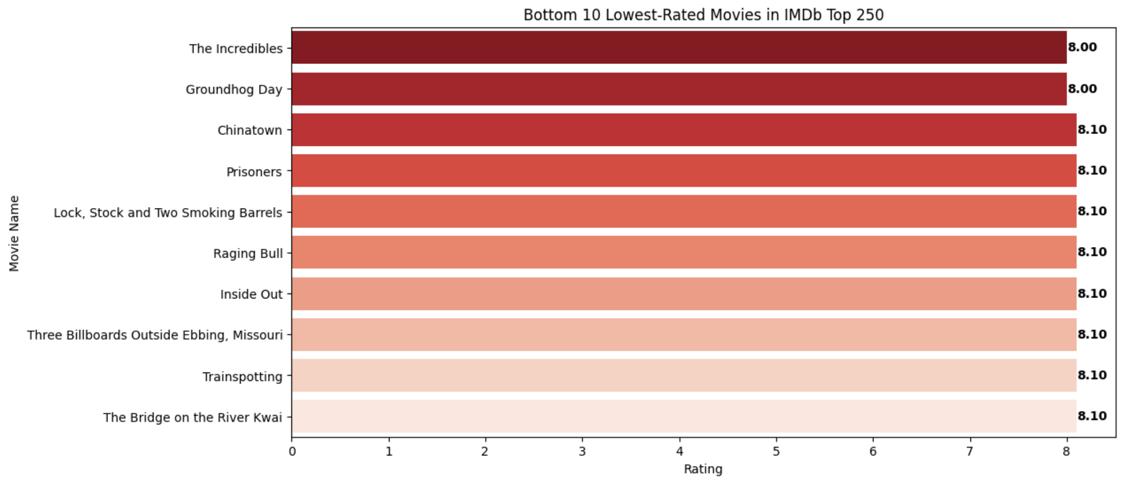


10. Bottom 10 Lowest Rated Movies

```
[161]: df['Rating'] = pd.to_numeric(df['Rating'], errors='coerce')

bottom_10_movies = df.nsmallest(10, 'Rating')

plt.figure(figsize=(12, 6))
ax = sns.barplot(x='Rating', y='Movie Name', data=bottom_10_movies,␣
 ↪palette='Reds_r')

for index, value in enumerate(bottom_10_movies['Rating']):
    ax.text(value, index, f'{value:.2f}', ha='left', va='center',␣
 ↪color='black', fontweight='bold')
```

```python
plt.title('Bottom 10 Lowest-Rated Movies in IMDb Top 250')
plt.xlabel('Rating')
plt.ylabel('Movie Name')
plt.show()
```

```
<ipython-input-161-8d703d55fd1e>:8: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in
v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same
effect.

  ax = sns.barplot(x='Rating', y='Movie Name', data=bottom_10_movies,
palette='Reds_r')
```



Thank You !!