In [105…
```
import json
from bs4 import BeautifulSoup
import requests

url = "https://www.imdb.com/chart/top/"
headers = {"User-Agent": "Mozilla/5.0"}

html = requests.get(url, headers=headers).text
soup = BeautifulSoup(html, "html.parser")

data = json.loads(soup.select_one("script[type='application/json']").string)

movies = data["props"]["pageProps"]["pageData"]["chartTitles"]["edges"]
print(len(movies))
```

```
250
```

In [106…
```
movie_data = []

for m in movies:
    node = m["node"]

    movie_data.append({
        "Rank": m["currentRank"],
        "Title": node["titleText"]["text"],
        "Year": node["releaseYear"]["year"],
        "IMDb_Rating": node["ratingsSummary"]["aggregateRating"],
        "Votes": node["ratingsSummary"]["voteCount"],
        "IMDb_ID": node["id"]
    })
```

In [107…
```
len(movie_data)
movie_data[:3]
```

Out[107…
```
[{'Rank': 1,
  'Title': 'The Shawshank Redemption',
  'Year': 1994,
  'IMDb_Rating': 9.3,
  'Votes': 3140258,
  'IMDb_ID': 'tt0111161'},
 {'Rank': 2,
  'Title': 'The Godfather',
  'Year': 1972,
  'IMDb_Rating': 9.2,
  'Votes': 2192098,
  'IMDb_ID': 'tt0068646'},
 {'Rank': 3,
  'Title': 'The Dark Knight',
  'Year': 2008,
  'IMDb_Rating': 9.1,
  'Votes': 3116384,
  'IMDb_ID': 'tt0468569'}]
```

In [108…
```
import pandas as pd

df = pd.DataFrame(movie_data)
df.to_csv("imdb_top_250_movies.csv", index=False)

df.head()
df.shape
```

Out[108…
```
(250, 6)
```

In [109…
```
df.describe()
```

Out[109…

	Rank	Year	IMDb_Rating	Votes
count	250.000000	250.000000	250.000000	2.500000e+02
mean	125.500000	1988.780000	8.310400	7.485833e+05
std	72.312977	25.609274	0.228782	6.156423e+05
min	1.000000	1921.000000	8.000000	2.727700e+04
25%	63.250000	1973.000000	8.100000	2.392145e+05
50%	125.500000	1995.500000	8.200000	6.043515e+05
75%	187.750000	2009.000000	8.400000	1.128338e+06
max	250.000000	2025.000000	9.300000	3.140258e+06

In [110…
```
df.isna().sum()
df.duplicated().sum()
```

Out[110…
```
np.int64(0)
```

In [147…
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

sns.set_style("whitegrid")

df = pd.read_csv("imdb_top_250_movies.csv")
df["log_votes"] = np.log10(df["Votes"])
```

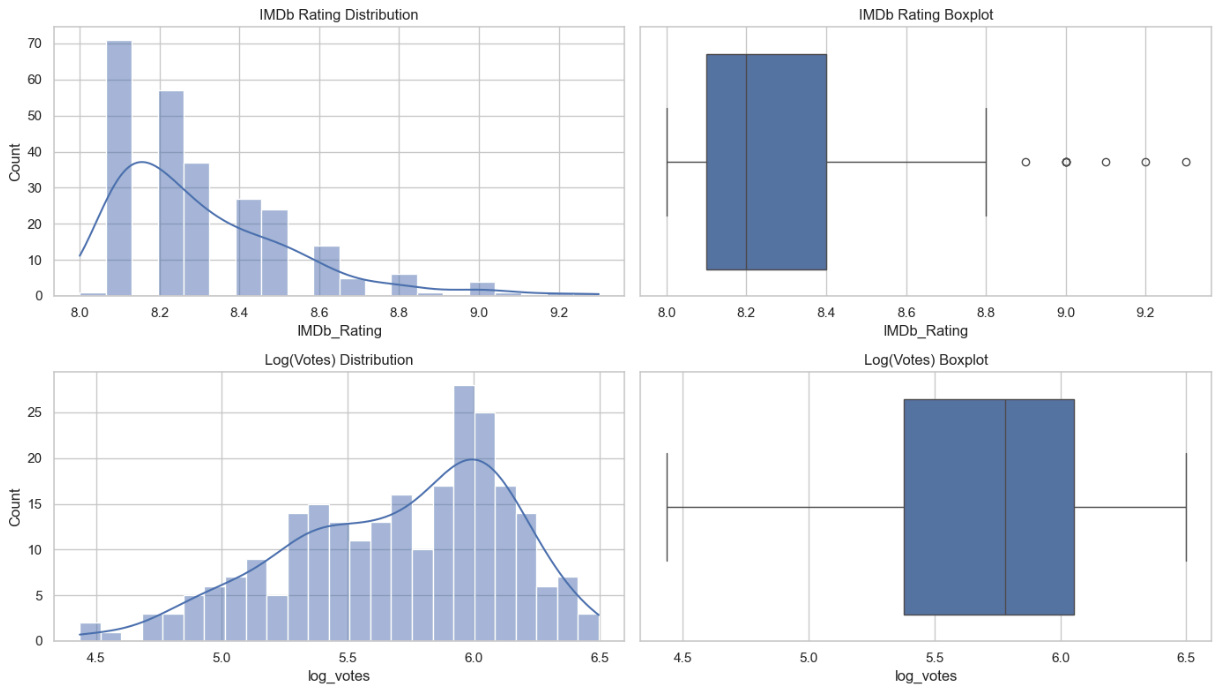
UNIVARIATE ANALYSIS

> GOAL

- Understand distribution, spread, and outliers of individual variables.

In [148…
```
fig, axes = plt.subplots(2, 2, figsize=(14,8))

sns.histplot(df["IMDb_Rating"], bins=20, kde=True, ax=axes[0,0])
axes[0,0].set_title("IMDb Rating Distribution")
```

```
sns.boxplot(x=df["IMDb_Rating"], ax=axes[0,1])
axes[0,1].set_title("IMDb Rating Boxplot")

sns.histplot(df["log_votes"], bins=25, kde=True, ax=axes[1,0])
axes[1,0].set_title("Log(Votes) Distribution")

sns.boxplot(x=df["log_votes"], ax=axes[1,1])
axes[1,1].set_title("Log(Votes) Boxplot")

plt.tight_layout()
plt.show()
```



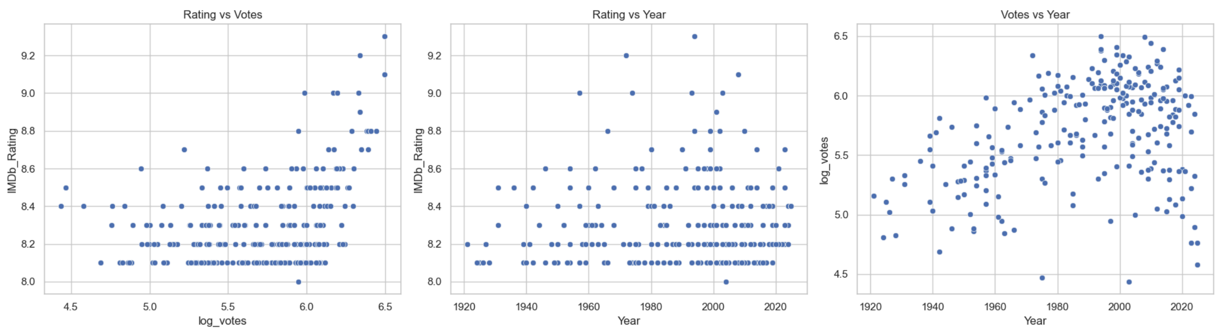
BIVARIATE

> GOAL

- Understand relationships and correlations.

In [149…

```
fig, axes = plt.subplots(1, 3, figsize=(18,5))

sns.scatterplot(x="log_votes", y="IMDb_Rating", data=df, ax=axes[0])
axes[0].set_title("Rating vs Votes")

sns.scatterplot(x="Year", y="IMDb_Rating", data=df, ax=axes[1])
axes[1].set_title("Rating vs Year")

sns.scatterplot(x="Year", y="log_votes", data=df, ax=axes[2])
axes[2].set_title("Votes vs Year")

plt.tight_layout()
plt.show()
```

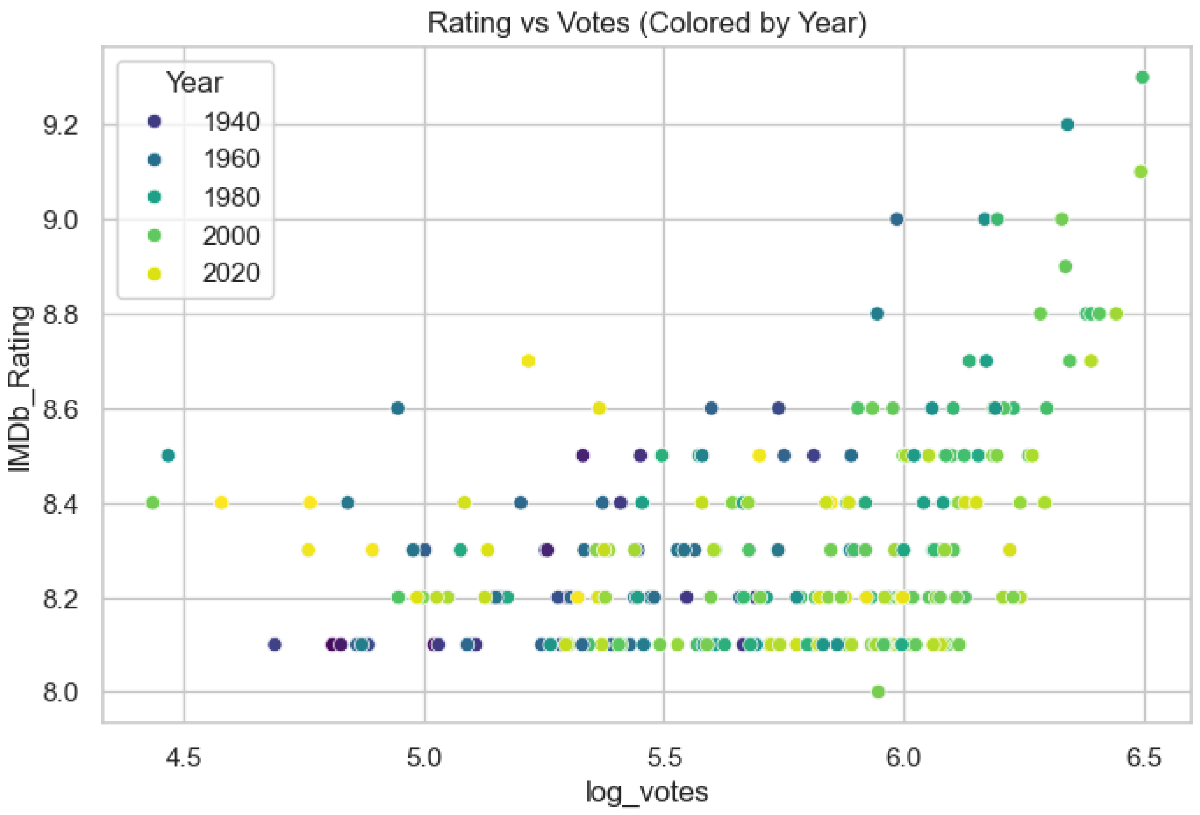


MULTIVARIATE

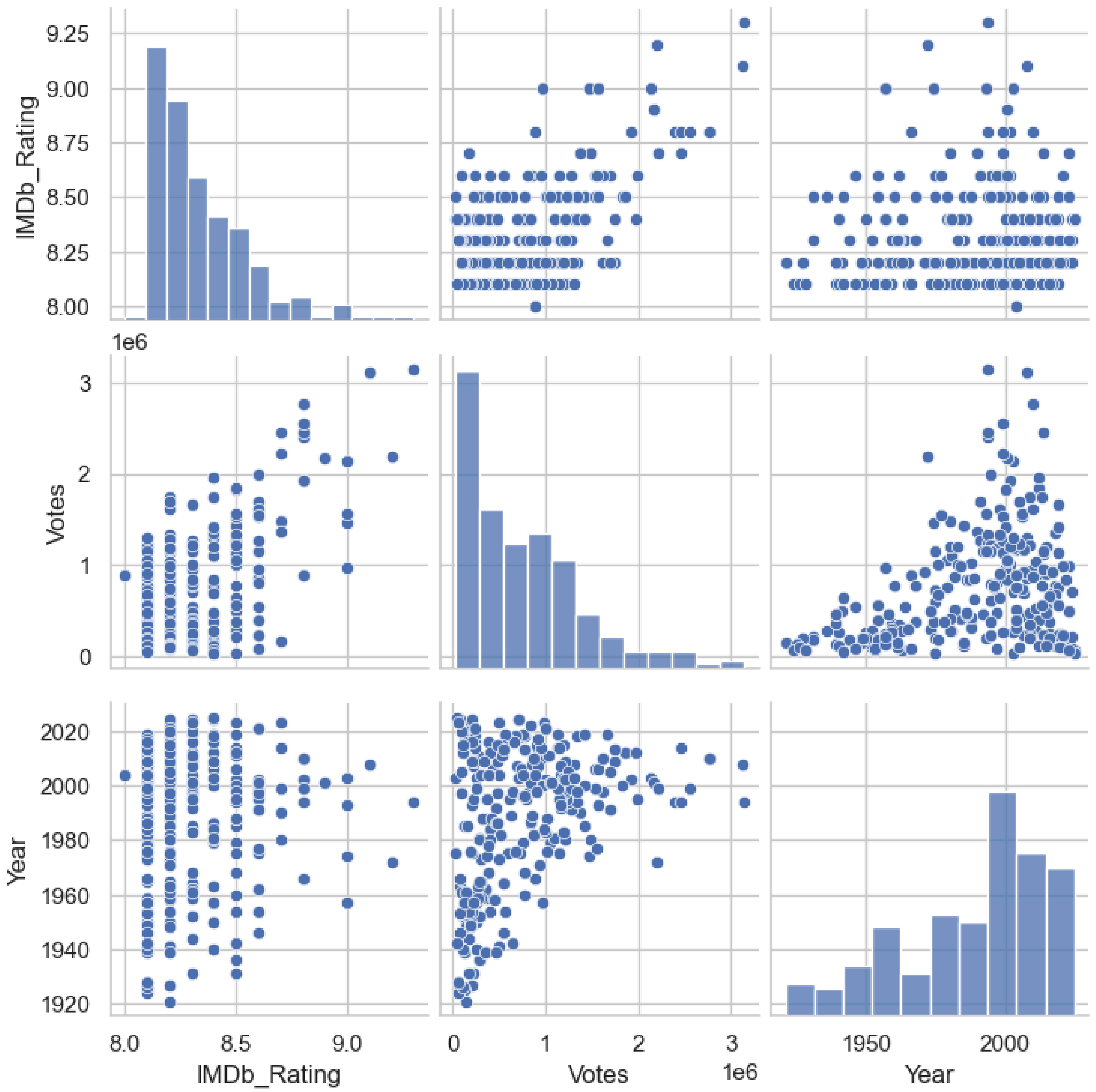
> GOAL

- Identify joint patterns and interactions.

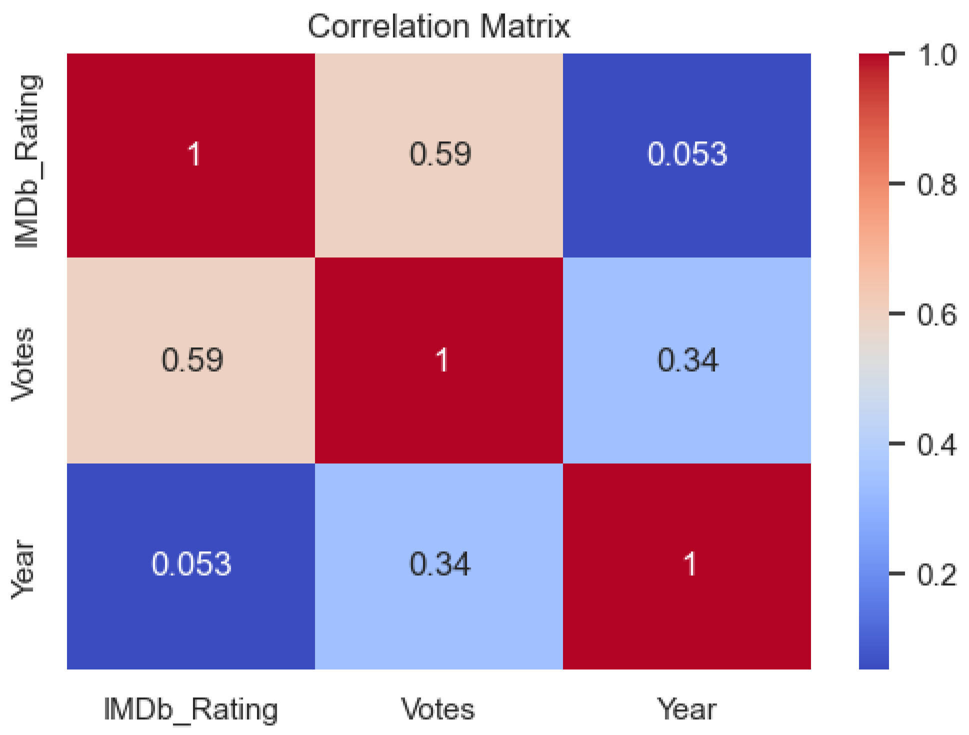
In [150…
```
plt.figure(figsize=(8,5))
sns.scatterplot(
    x="log_votes",
    y="IMDb_Rating",
    hue="Year",
    palette="viridis",
    data=df
)
plt.title("Rating vs Votes (Colored by Year)")
plt.show()
```



In [151…
```
sns.pairplot(df[["IMDb_Rating", "Votes", "Year"]])
plt.show()
```



```
In [157…  plt.figure(figsize=(6,4))
          sns.heatmap(
              df[["IMDb_Rating", "Votes", "Year"]].corr(),
              annot=True,
              cmap="coolwarm"
          )
          plt.title("Correlation Matrix")
          plt.show()
```


Correlation Matrix
IMDb_Rating
Votes
Year
1
0.59
0.053
0.59
1
0.34
0.053
0.34
1
IMDb_Rating
Votes
Year
1.0
0.8
0.6
0.4
0.2

```
In [ ]:
```