IMDB Movies Dataset

IMDB Movies Dataset https://www.kaggle.com/datasets/harshitshankhdhar/imdb-dataset-of-top-1000-movies-and-tv-shows Dataset provided by Kaggle

Interesting questions to ask:

1. What is the most popular movie genre? (Average IMDb Rating for Each Genre)

2. Box Office Sales by Year

3. Correlation Between Movie's Runtime and IMDb Rating

4. Top 25 Grossing Genres

5. Top 25 Grossing Movies of all time

Data Analysis Project Process Steps:

-- Open .csv file in Google Sheets to have a quick look (do screen recordings)

-- Clean data, correct file names, remove extra characters and null values, save as .csv

-- Post a poll about the dataset and ask people for questions to be answered in data

-- Make a list of interesting questions to ask (in a Jupyter notebook)

-- Post credit for original dataset

-- Open in Python, SQL, Jupiter Notebooks (The note book will be made public on Kaggle)

-- Open in Tableau, Looker, PowerBI

-- Create visualizations (Static or Dynamic)

-- Report any notable observations

In [29]:
```python
import pandas as pd
```

In [30]:
```python
import numpy as np
```

In [31]:
```python
movies = pd.read_csv (r"C:\Users\remil\Desktop\Data Sets\Capstone Project - IMDB Moves
```

This will give us a quick peek at the first 5 rows of the table.

In [32]:
```
movies.head(3)
```

Out[32]:

	Poster_Link	Title	Year	Certificate	Runtime	Genre	IMDB_Rating
0	https://m.media-amazon.com/images/M/MV5BNWMxYT...	300	2006	R	117	Action, Drama	7.6
1	https://m.media-amazon.com/images/M/MV5BOTdmNT...	1917	2019	R	119	Drama, Thriller, War	8.3
2	https://m.media-amazon.com/images/M/MV5BMTk5Mj...	(500) Days of Summer	2009	UA	95	Comedy, Drama, Romance	7.7

In [33]:
```
movies.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 17 columns):
 #   Column        Non-Null Count  Dtype  
---  ------        --------------  -----  
 0   Poster_Link   1000 non-null   object 
 1   Title         1000 non-null   object 
 2   Year          1000 non-null   int64  
 3   Certificate   899 non-null    object 
 4   Runtime       1000 non-null   int64  
 5   Genre         1000 non-null   object 
 6   IMDB_Rating   1000 non-null   float64
 7   Overview      1000 non-null   object 
 8   Meta_score    843 non-null    float64
 9   Director      1000 non-null   object 
 10  Star1         1000 non-null   object 
 11  Star2         1000 non-null   object 
 12  Star3         1000 non-null   object 
 13  Star4         1000 non-null   object 
 14  Votes         1000 non-null   int64  
 15  Cast          1000 non-null   object 
 16  Gross         831 non-null    object 
dtypes: float64(2), int64(3), object(12)
memory usage: 132.9+ KB
```

Initial Observations

This dataset was downloaded from Kaggle, has a high rating and looks like a fun learning experience.

After downloading and exploring the dataset, I noticed a few oddities. The first was having 4 Star columns (Star1-Star4). I presume the goal is to allow up to our Actors to be credited. It's also not entirely clear if Star1 is the top billed actor, followed by Star2, etc. It does make it tricky to search with more granularity, and my quick solution was to combine all the columns into one column called 'Cast'.

Of the 1000 movies listed, 171 films were missing the gross amount earned. Most were older films or foreign made films where gross earnings were not available.

Data Columns:

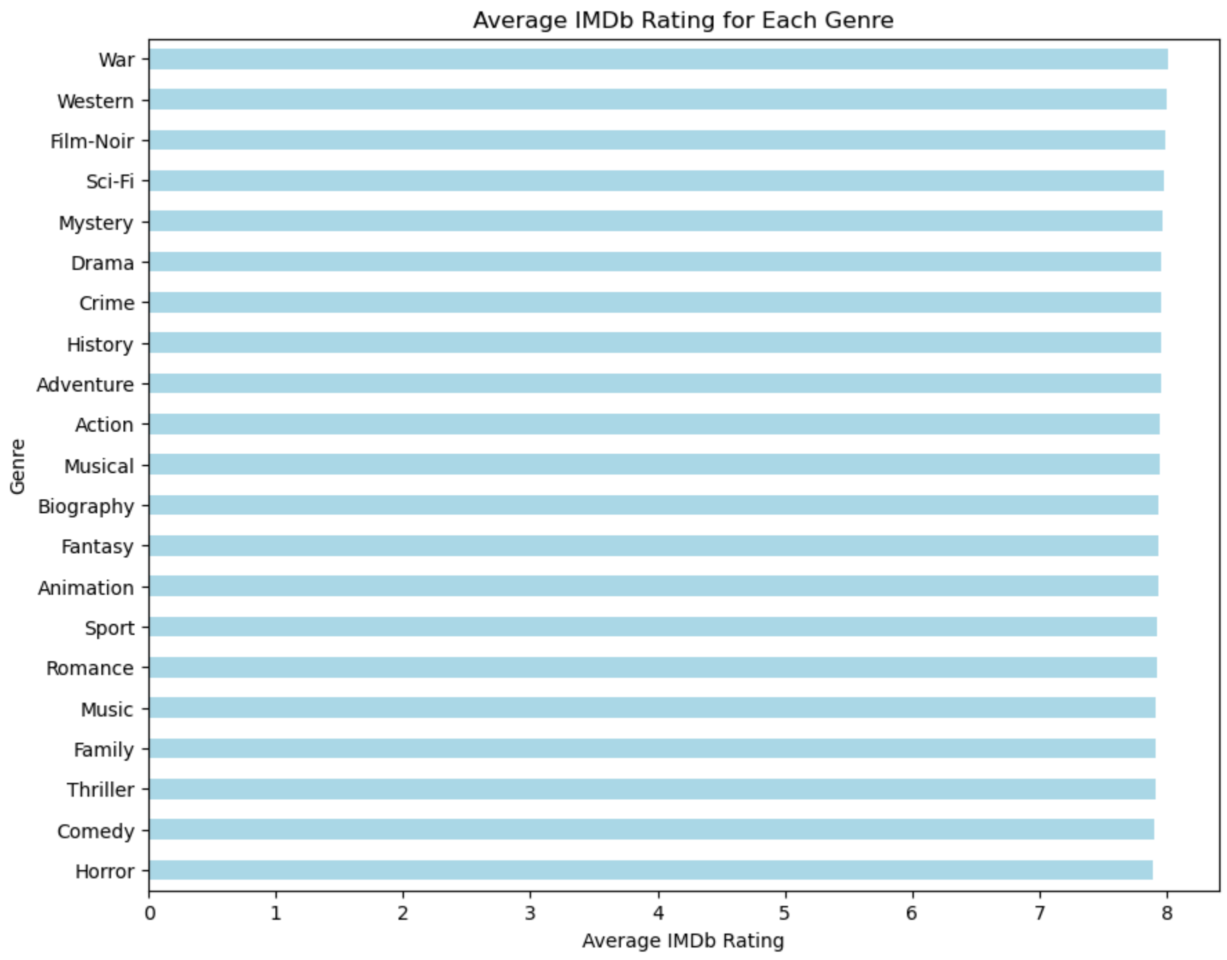
- Poster_Link - Link of the poster that imdb using - Not used
- Series_Title - Name of the movie
- Released_Year - Year at which that movie released
- Certificate - Certificate earned by that movie - missing 103 entries
- Runtime - Total runtime of the movie
- Genre - Genre of the movie
- IMDB_Rating - Rating of the movie at IMDB site
- Overview - mini story/ summary
- Meta_score - Score earned by the movie - 159 entries missing
- Director - Name of the Director
- Star1,Star2,Star3,Star4 - Name of the Stars
- No_of_votes - Total number of votes
- Gross - Money earned by that movie - 171 entries missing
- Confirmed all cells populated, documented missing cells above

Data Cleaning Steps

- Collapsed unused columns (Poster Link, Movie Overview)
- Merged Star1-Star4 into Cast
- Removed ‘min’ from runtime, confirmed numerical
- Streamlined column title names
- Checked movie rating system, changed A (Adult) to R (Restricted) since they’re essentially the same
-

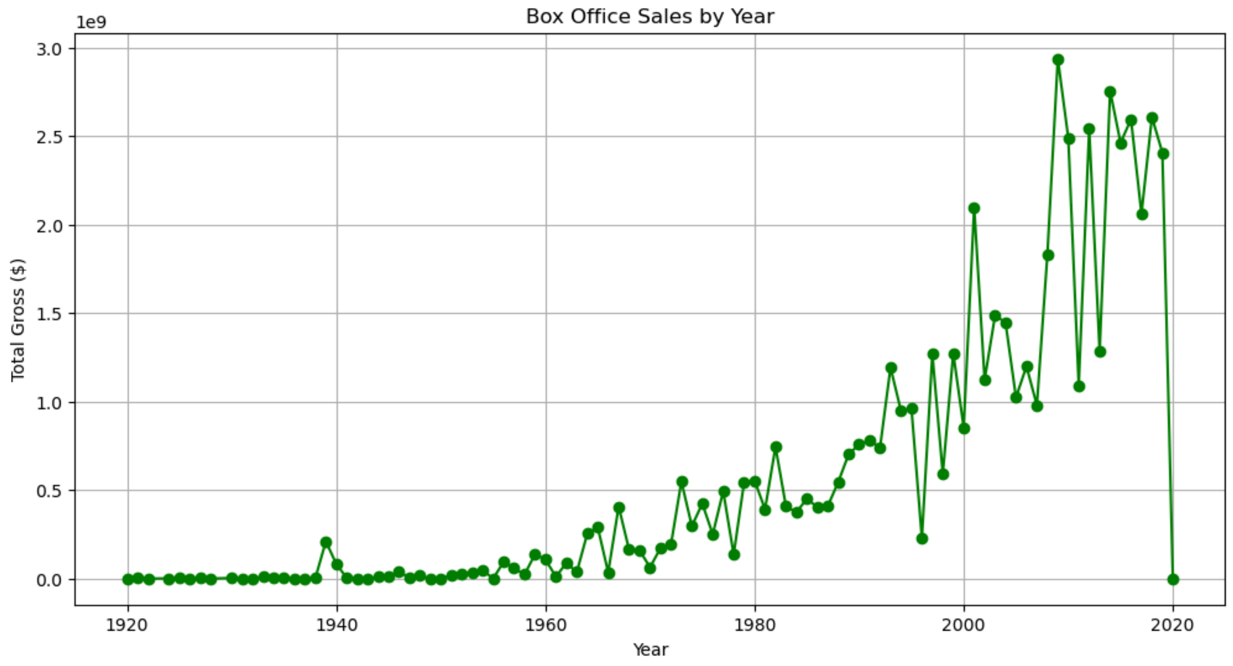
1. Average IMDb Rating for Each Genre

In [34]:
```
import pandas as pd
import matplotlib.pyplot as plt

# Load your dataset
data = pd.read_csv(r"C:\Users\remil\Desktop\Data Sets\Capstone Project - IMDB Moves Da

# Split the 'Genre' column and explode it into a long format
data['Genre'] = data['Genre'].apply(lambda x: x.split(', '))
genre_data = data.explode('Genre')

# Calculate average IMDb rating per genre
genre_ratings = genre_data.groupby('Genre')['IMDB_Rating'].mean().sort_values()

# Plot
plt.figure(figsize=(10, 8))
genre_ratings.plot(kind='barh', color='lightblue')
plt.xlabel('Average IMDb Rating')
plt.title('Average IMDb Rating for Each Genre')
plt.show()
```



2. Box Office Sales by Year

In [38]:
```
import pandas as pd
import matplotlib.pyplot as plt

# Load your dataset
data = pd.read_csv(r"C:\Users\remil\Desktop\Data Sets\Capstone Project - IMDB Moves Da
# Convert 'Gross' from string to float, removing commas and other non-numeric characte
data['Gross'] = data['Gross'].str.replace(',', '').str.replace('$', '').astype(float)

# Group by 'Year' and sum up the 'Gross' values
annual_gross = data.groupby('Year')['Gross'].sum()

# Plot
plt.figure(figsize=(12, 6))
annual_gross.plot(kind='line', marker='o', color='green')
plt.title('Box Office Sales by Year')
plt.xlabel('Year')
plt.ylabel('Total Gross ($)')
plt.grid(True)
plt.show()
```

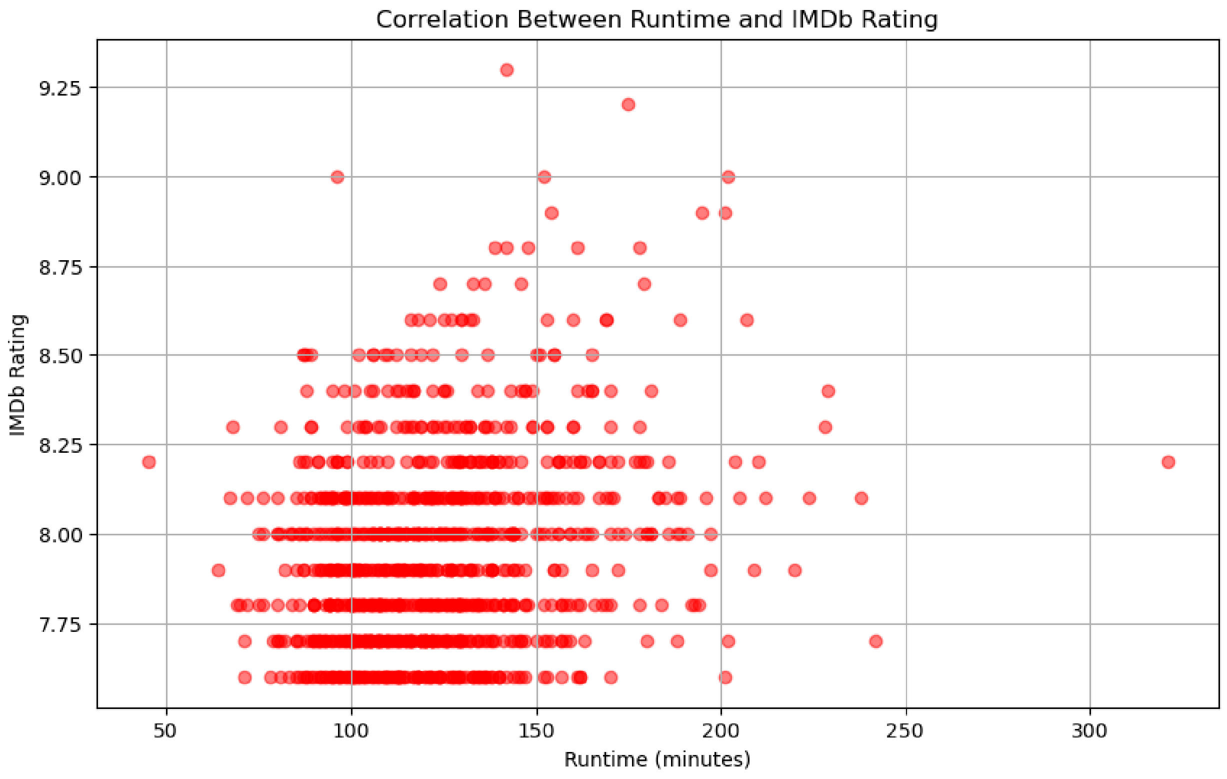


3. Correlation Between Movie's Runtime and IMDb Rating

In [37]:
```
import pandas as pd
import matplotlib.pyplot as plt

# Load your dataset
data = pd.read_csv(r"C:\Users\remil\Desktop\Data Sets\Capstone Project - IMDB Moves Da

# Check the datatype of the 'Runtime' column
print("Data type of 'Runtime' before conversion:", data['Runtime'].dtype)

# Check for null values
print("Number of null values in 'Runtime':", data['Runtime'].isnull().sum())

# If 'Runtime' is not a string type and contains no nulls, skip the string conversion
if data['Runtime'].dtype != 'O':  # 'O' stands for object, typically used for strings
    data['Runtime'] = data['Runtime'].astype(int)
else:
    # Assuming the data is in a format like '142 min' and contains no nulls
    data['Runtime'] = data['Runtime'].str.extract('(\d+)').astype(int)
```

```
# Scatter plot to show correlation
plt.figure(figsize=(10, 6))
plt.scatter(data['Runtime'], data['IMDB_Rating'], alpha=0.5, color='red')
plt.title('Correlation Between Runtime and IMDb Rating')
plt.xlabel('Runtime (minutes)')
plt.ylabel('IMDb Rating')
plt.grid(True)
plt.show()
```

```
Data type of 'Runtime' before conversion: int64
Number of null values in 'Runtime': 0
```

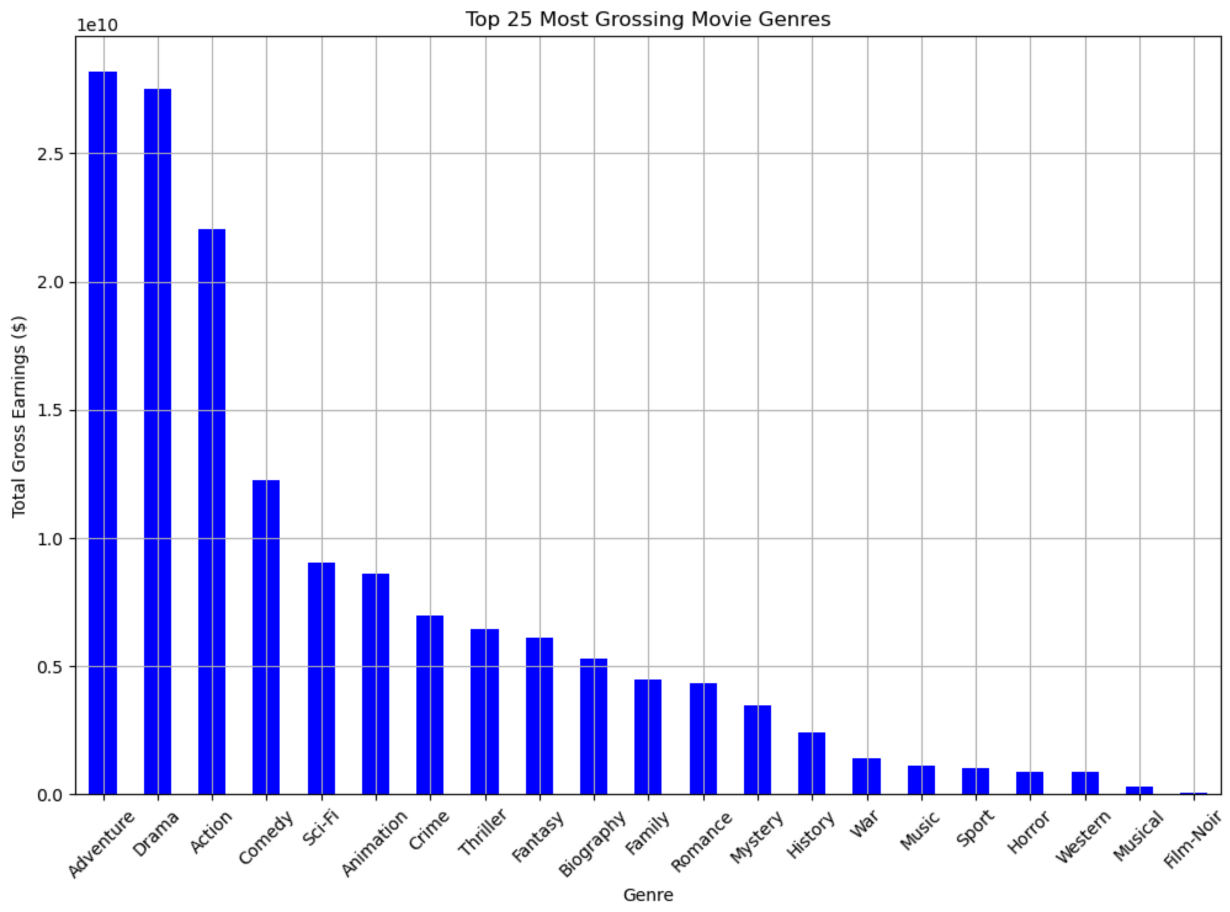


4. Top 25 Grossing Movie Genres

In [40]:

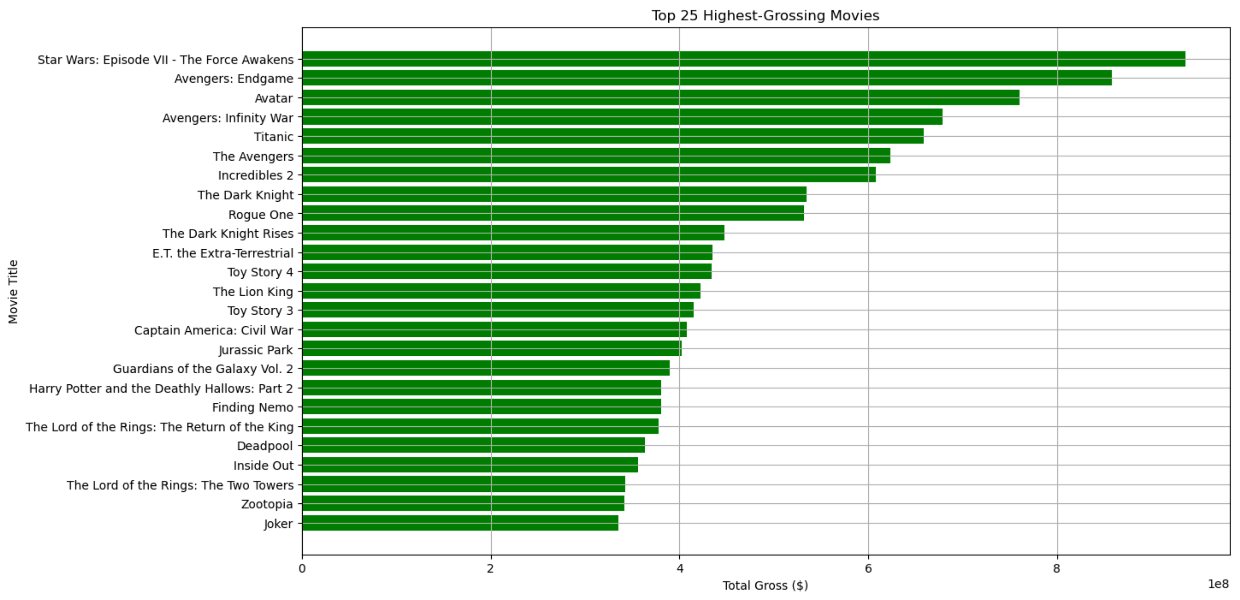
```
import pandas as pd
import matplotlib.pyplot as plt

# Load your dataset
data = pd.read_csv(r"C:\Users\remil\Desktop\Data Sets\Capstone Project - IMDB Moves Da

# Split the 'Genre' column on each movie into separate rows
data['Genre'] = data['Genre'].str.split(', ')
genre_exploded = data.explode('Genre')

# Convert 'Gross' from string to float, if necessary, removing commas and other non-nu
genre_exploded['Gross'] = genre_exploded['Gross'].str.replace(',', '').str.replace('$'

# Group by 'Genre' and sum up the 'Gross' values
genre_gross_sum = genre_exploded.groupby('Genre')['Gross'].sum().sort_values(ascending

# Take the top 25 genres
top_25_genres = genre_gross_sum.head(25)

# Plotting
plt.figure(figsize=(12, 8))
```

```
top_25_genres.plot(kind='bar', color='blue')
plt.title('Top 25 Most Grossing Movie Genres')
plt.xlabel('Genre')
plt.ylabel('Total Gross Earnings ($)')
plt.xticks(rotation=45)
plt.grid(True)
plt.show()
```



5. Top 25 Grossing Movies of all time

In [42]:
```
import pandas as pd
import matplotlib.pyplot as plt

# Load your dataset
data = pd.read_csv(r"C:\Users\remil\Desktop\Data Sets\Capstone Project - IMDB Moves Da

# Convert 'Gross' from string to float, removing commas and other non-numeric characte
data['Gross'] = data['Gross'].str.replace(',', '').str.replace('$', '').astype(float)

# Sort the data by 'Gross' in descending order to get the top-grossing movies
top_grossing_movies = data.sort_values(by='Gross', ascending=False).head(25)

# Plotting the top 25 highest-grossing movies
plt.figure(figsize=(14, 8))
plt.barh(top_grossing_movies['Title'], top_grossing_movies['Gross'], color='green')
plt.xlabel('Total Gross ($)')
plt.ylabel('Movie Title')
plt.title('Top 25 Highest-Grossing Movies')
plt.gca().invert_yaxis()  # Invert the y-axis to have the highest grossing at the top
plt.grid(True)
plt.show()
```


Top 25 Highest-Grossing Movies
Movie Title
Total Gross ($)
1e8
Star Wars: Episode VII - The Force Awakens
Avengers: Endgame
Avatar
Avengers: Infinity War
Titanic
The Avengers
Incredibles 2
The Dark Knight
Rogue One
The Dark Knight Rises
E.T. the Extra-Terrestrial
Toy Story 4
The Lion King
Toy Story 3
Captain America: Civil War
Jurassic Park
Guardians of the Galaxy Vol. 2
Harry Potter and the Deathly Hallows: Part 2
Finding Nemo
The Lord of the Rings: The Return of the King
Deadpool
Inside Out
The Lord of the Rings: The Two Towers
Zootopia
Joker