

IMDB Movie Dataset

Here's a data set of 1,000 most popular movies on IMDB in the last 10 years. The data points included are: Title, Genre, Description, Director, Actors, Year, Runtime, Rating, Votes, Revenue, Metascore

```
In [1]: # install pandas
pip install pandas
```

```
Requirement already satisfied: pandas in c:\users\hp\anaconda3\lib\site-packages (2.2.2)
Requirement already satisfied: numpy>=1.23.2 in c:\users\hp\anaconda3\lib\site-packages (from pandas) (1.24.3)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\hp\anaconda3\lib\site-packages (from pandas) (2.8.2)
Requirement already satisfied: pytz>=2020.1 in c:\users\hp\anaconda3\lib\site-packages (from pandas) (2022.7)
Requirement already satisfied: tzdata>=2022.7 in c:\users\hp\anaconda3\lib\site-packages (from pandas) (2023.3)
Requirement already satisfied: six>=1.5 in c:\users\hp\anaconda3\lib\site-packages (from python-dateutil>=2.8.2 -> pandas) (1.16.0)
Note: you may need to restart the kernel to use updated packages.
```

```
In [3]: # Install Libraries

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

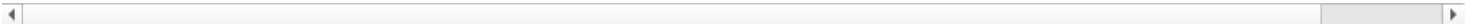
```
In [4]: # Import IMDB movie dataset

df = pd.read_csv('IMDB-Movie-Data.csv')
df
```

Out[4]:

	Rank	Title	Genre	Description	Director	Actors	Year	Runtime (Minutes)	Rating	Votes	Revenue (Millions)	Me
0	1	Guardians of the Galaxy	Action,Adventure,Sci-Fi	A group of intergalactic criminals are forced ...	James Gunn	Chris Pratt, Vin Diesel, Bradley Cooper, Zoe S...	2014	121	8.1	757074	333.13	
1	2	Prometheus	Adventure,Mystery,Sci-Fi	Following clues to the origin of mankind, a te...	Ridley Scott	Noomi Rapace, Logan Marshall-Green, Michael Fa...	2012	124	7.0	485820	126.46	
2	3	Split	Horror,Thriller	Three girls are kidnapped by a man with a diag...	M. Night Shyamalan	James McAvoy, Anya Taylor-Joy, Haley Lu Richar...	2016	117	7.3	157606	138.12	
3	4	Sing	Animation,Comedy,Family	In a city of humanoid animals, a hustling thea...	Christophe Lourdelet	Matthew McConaughey,Reese Witherspoon, Seth Ma...	2016	108	7.2	60545	270.32	
4	5	Suicide Squad	Action,Adventure,Fantasy	A secret government agency recruits some of th...	David Ayer	Will Smith, Jared Leto, Margot Robbie, Viola D...	2016	123	6.2	393727	325.02	
...
995	996	Secret in Their Eyes	Crime,Drama,Mystery	A tight-knit team of rising investigators, alo...	Billy Ray	Chiwetel Ejiofor, Nicole Kidman, Julia Roberts...	2015	111	6.2	27585	NaN	
996	997	Hostel: Part II	Horror	Three American college students studying abroa...	Eli Roth	Lauren German, Heather Matarazzo, Bijou Philli...	2007	94	5.5	73152	17.54	
997	998	Step Up 2: The Streets	Drama,Music,Romance	Romantic sparks occur between two dance studen...	Jon M. Chu	Robert Hoffman, Briana Evigan, Cassie Ventura,...	2008	98	6.2	70699	58.01	
998	999	Search Party	Adventure,Comedy	A pair of friends embark on a mission to reuni...	Scot Armstrong	Adam Pally, T.J. Miller, Thomas Middleditch,Sh...	2014	93	5.6	4881	NaN	
999	1000	Nine Lives	Comedy,Family,Fantasy	A stuffy businessman finds himself trapped ins...	Barry Sonnenfeld	Kevin Spacey, Jennifer Garner, Robbie Amell,Ch...	2016	87	5.3	12435	19.64	

1000 rows × 12 columns



1. Display Top 10 Rows of The Dataset

In [5]:

```
df.head(10)
```

Out[5]:

	Rank	Title	Genre	Description	Director	Actors	Year	Runtime (Minutes)	Rating	Votes	Revenue (Millions)	Meta
0	1	Guardians of the Galaxy	Action,Adventure,Sci-Fi	A group of intergalactic criminals are forced ...	James Gunn	Chris Pratt, Vin Diesel, Bradley Cooper, Zoe S...	2014	121	8.1	757074	333.13	
1	2	Prometheus	Adventure,Mystery,Sci-Fi	Following clues to the origin of mankind, a te...	Ridley Scott	Noomi Rapace, Logan Marshall- Green, Michael Fa...	2012	124	7.0	485820	126.46	
2	3	Split	Horror,Thriller	Three girls are kidnapped by a man with a diag...	M. Night Shyamalan	James McAvoy, Anya Taylor-Joy, Haley Lu Richar...	2016	117	7.3	157606	138.12	
3	4	Sing	Animation,Comedy,Family	In a city of humanoid animals, a hustling thea...	Christophe Lourdelet	Matthew McConaughey,Reese Witherspoon, Seth Ma...	2016	108	7.2	60545	270.32	
4	5	Suicide Squad	Action,Adventure,Fantasy	A secret government agency recruits some of th...	David Ayer	Will Smith, Jared Leto, Margot Robbie, Viola D...	2016	123	6.2	393727	325.02	
5	6	The Great Wall	Action,Adventure,Fantasy	European mercenaries searching for black powde...	Yimou Zhang	Matt Damon, Tian Jing, Willem Dafoe, Andy Lau	2016	103	6.1	56036	45.13	
6	7	La La Land	Comedy,Drama,Music	A jazz pianist falls for an aspiring actress i...	Damien Chazelle	Ryan Gosling, Emma Stone, Rosemarie DeWitt, J....	2016	128	8.3	258682	151.06	
7	8	Mindhorn	Comedy	A has-been actor best known for playing the ti...	Sean Foley	Essie Davis, Andrea Riseborough, Julian Barrat...	2016	89	6.4	2490	NaN	
8	9	The Lost City of Z	Action,Adventure,Biography	A true-life drama, centering on British explor...	James Gray	Charlie Hunnam, Robert Pattinson, Sienna Mille...	2016	141	7.1	7188	8.01	
9	10	Passengers	Adventure,Drama,Romance	A spacecraft traveling to a distant colony pla...	Morten Tyldum	Jennifer Lawrence, Chris Pratt, Michael Sheen,...	2016	116	7.0	192177	100.01	

2. Check Last 10 Rows of The Dataset

In [6]: `df.tail(10)`

Out[6]:

	Rank	Title	Genre	Description	Director	Actors	Year	Runtime (Minutes)	Rating	Votes	Revenue (Millions)	Metascore
990	991	Underworld: Rise of the Lycans	Action,Adventure,Fantasy	An origins story centered on the centuries-old...	Patrick Tatopoulos	Rhona Mitra, Michael Sheen, Bill Nighy, Steven...	2009	92	6.6	129708	45.80	4
991	992	Taare Zameen Par	Drama,Family,Music	An eight-year-old boy is thought to be a lazy ...	Aamir Khan	Darsheel Safary, Aamir Khan, Tanay Chheda, Sac...	2007	165	8.5	102697	1.20	4
992	993	Take Me Home Tonight	Comedy,Drama,Romance	Four years after graduation, an awkward high s...	Michael Dowse	Topher Grace, Anna Faris, Dan Fogler, Teresa P...	2011	97	6.3	45419	6.92	N
993	994	Resident Evil: Afterlife	Action,Adventure,Horror	While still out to destroy the evil Umbrella C...	Paul W.S. Anderson	Milla Jovovich, Ali Larter, Wentworth Miller,K...	2010	97	5.9	140900	60.13	3
994	995	Project X	Comedy	3 high school seniors throw a birthday party t...	Nima Nourizadeh	Thomas Mann, Oliver Cooper, Jonathan Daniel Br...	2012	88	6.7	164088	54.72	4
995	996	Secret in Their Eyes	Crime,Drama,Mystery	A tight-knit team of rising investigators, alo...	Billy Ray	Chiwetel Ejiofor, Nicole Kidman, Julia Roberts...	2015	111	6.2	27585	NaN	4
996	997	Hostel: Part II	Horror	Three American college students studying abroa...	Eli Roth	Lauren German, Heather Matarazzo, Bijou Philli...	2007	94	5.5	73152	17.54	4
997	998	Step Up 2: The Streets	Drama,Music,Romance	Romantic sparks occur between two dance studen...	Jon M. Chu	Robert Hoffman, Briana Evigan, Cassie Ventura,...	2008	98	6.2	70699	58.01	5
998	999	Search Party	Adventure,Comedy	A pair of friends embark on a mission to reuni...	Scot Armstrong	Adam Pally, T.J. Miller, Thomas Middleditch,Sh...	2014	93	5.6	4881	NaN	2
999	1000	Nine Lives	Comedy,Family,Fantasy	A stuffy businessman finds himself trapped ins...	Barry Sonnenfeld	Kevin Spacey, Jennifer Garner, Robbie Amell,Ch...	2016	87	5.3	12435	19.64	1

3. Find Shape of Our Dataset (Number of Rows And Number of Columns)

```
In [7]: rows,columns = df.shape
```

```
In [8]: print(f"The no. of rows are {rows} and columns are {columns}")
```

The no. of rows are 1000 and columns are 12

4. Getting Information About Our Dataset Like Total Number Rows, Total Number of Columns, Datatypes of Each Column And Memory Requirement

```
In [9]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 12 columns):
#   Column                Non-Null Count  Dtype
---  ---
0   Rank                  1000 non-null  int64
1   Title                 1000 non-null  object
2   Genre                 1000 non-null  object
3   Description            1000 non-null  object
4   Director              1000 non-null  object
5   Actors                1000 non-null  object
6   Year                  1000 non-null  int64
7   Runtime (Minutes)     1000 non-null  int64
8   Rating                1000 non-null  float64
9   Votes                 1000 non-null  int64
10  Revenue (Millions)    872 non-null   float64
11  Metascore             936 non-null   float64
dtypes: float64(3), int64(4), object(5)
memory usage: 93.9+ KB
```

5. Check Missing Values In The Dataset

```
In [10]: print("Any missing values in IMDB movie dataset ? :", df.isnull().values.any())
```

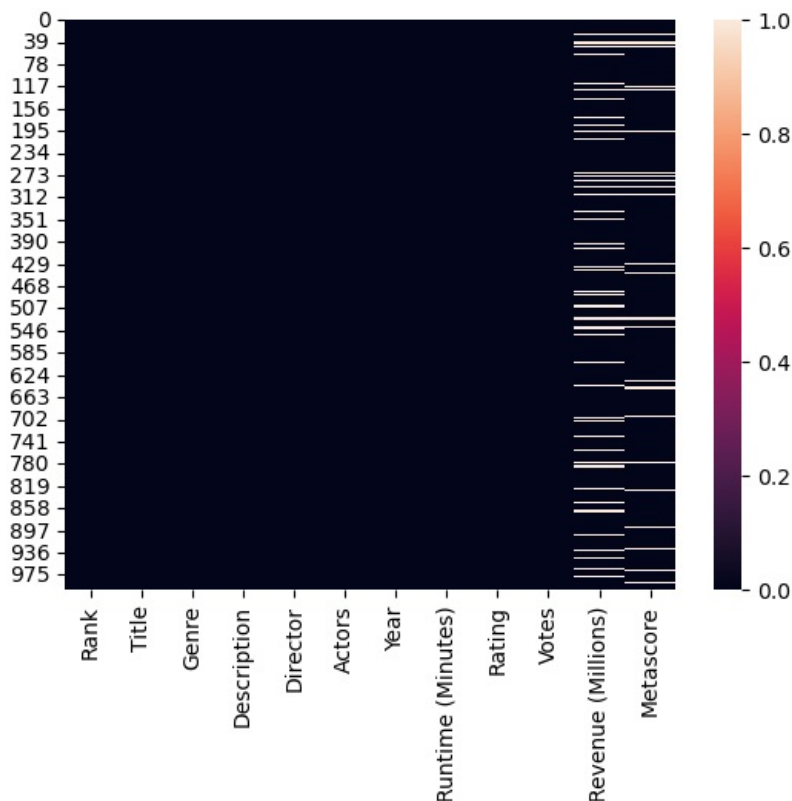
Any missing values in IMDB movie dataset ? : True

```
In [11]: # sum() method is used to find out the sum of the True values
df.isnull().sum()
```

```
Out[11]: Rank                0
Title                    0
Genre                   0
Description              0
Director                0
Actors                  0
Year                    0
Runtime (Minutes)       0
Rating                  0
Votes                   0
Revenue (Millions)     128
Metascore                64
dtype: int64
```

```
In [12]: # Visualize missing values using seaborn
sns.heatmap(df.isnull())
```

```
Out[12]: <Axes: >
```



```
In [13]: # missing values in percentage
per_missing = round(df.isnull().sum() * 100 / len(df))
per_missing
```

```
Out[13]: Rank          0.0
Title          0.0
Genre          0.0
Description    0.0
Director       0.0
Actors         0.0
Year           0.0
Runtime (Minutes) 0.0
Rating         0.0
Votes         0.0
Revenue (Millions) 13.0
Metascore      6.0
dtype: float64
```

6. Drop All The Missing Values

```
In [14]: # Drop rows which contain missing values and modify existing dataset
df.dropna(axis=0, inplace=True)
```

7. Check For Duplicate Data

```
In [15]: dup_data = df.duplicated().any()
print("Are there any duplicate values ? :", dup_data)
```

Are there any duplicate values ? : False

```
In [16]: #To drop duplicate values
df = df.drop_duplicates()
df
```

Out[16]:

	Rank	Title	Genre	Description	Director	Actors	Year	Runtime (Minutes)	Rating	Votes	Revenue (Millions)	Me
0	1	Guardians of the Galaxy	Action,Adventure,Sci-Fi	A group of intergalactic criminals are forced ...	James Gunn	Chris Pratt, Vin Diesel, Bradley Cooper, Zoe S...	2014	121	8.1	757074	333.13	
1	2	Prometheus	Adventure,Mystery,Sci-Fi	Following clues to the origin of mankind, a te...	Ridley Scott	Noomi Rapace, Logan Marshall-Green, Michael Fa...	2012	124	7.0	485820	126.46	
2	3	Split	Horror,Thriller	Three girls are kidnapped by a man with a diag...	M. Night Shyamalan	James McAvoy, Anya Taylor-Joy, Haley Lu Richar...	2016	117	7.3	157606	138.12	
3	4	Sing	Animation,Comedy,Family	In a city of humanoid animals, a hustling thea...	Christophe Lourdelet	Matthew McConaughey,Reese Witherspoon, Seth Ma...	2016	108	7.2	60545	270.32	
4	5	Suicide Squad	Action,Adventure,Fantasy	A secret government agency recruits some of th...	David Ayer	Will Smith, Jared Leto, Margot Robbie, Viola D...	2016	123	6.2	393727	325.02	
...
993	994	Resident Evil: Afterlife	Action,Adventure,Horror	While still out to destroy the evil Umbrella C...	Paul W.S. Anderson	Milla Jovovich, Ali Larter, Wentworth Miller,K...	2010	97	5.9	140900	60.13	
994	995	Project X	Comedy	3 high school seniors throw a birthday party t...	Nima Nourizadeh	Thomas Mann, Oliver Cooper, Jonathan Daniel Br...	2012	88	6.7	164088	54.72	
996	997	Hostel: Part II	Horror	Three American college students studying abroa...	Eli Roth	Lauren German, Heather Matarazzo, Bijou Philli...	2007	94	5.5	73152	17.54	
997	998	Step Up 2: The Streets	Drama,Music,Romance	Romantic sparks occur between two dance studen...	Jon M. Chu	Robert Hoffman, Briana Evigan, Cassie Ventura,...	2008	98	6.2	70699	58.01	
999	1000	Nine Lives	Comedy,Family,Fantasy	A stuffy businessman finds himself trapped ins...	Barry Sonnenfeld	Kevin Spacey, Jennifer Garner, Robbie Amell,Ch...	2016	87	5.3	12435	19.64	

838 rows × 12 columns

8. Get Overall Statistics About The DataFrame

In [17]:

```
# Statistical data Only for numerical data
df.describe()
```

Out[17]:

	Rank	Year	Runtime (Minutes)	Rating	Votes	Revenue (Millions)	Metascore
count	838.000000	838.00000	838.000000	838.000000	8.380000e+02	838.000000	838.000000
mean	485.247017	2012.50716	114.638425	6.814320	1.932303e+05	84.564558	59.575179
std	286.572065	3.17236	18.470922	0.877754	1.930990e+05	104.520227	16.952416
min	1.000000	2006.00000	66.000000	1.900000	1.780000e+02	0.000000	11.000000
25%	238.250000	2010.00000	101.000000	6.300000	6.127650e+04	13.967500	47.000000
50%	475.500000	2013.00000	112.000000	6.900000	1.368795e+05	48.150000	60.000000
75%	729.750000	2015.00000	124.000000	7.500000	2.710830e+05	116.800000	72.000000
max	1000.000000	2016.00000	187.000000	9.000000	1.791916e+06	936.630000	100.000000

In [18]:

```
# statistical data for Categorial and numerical data
df.describe(include='all')
```

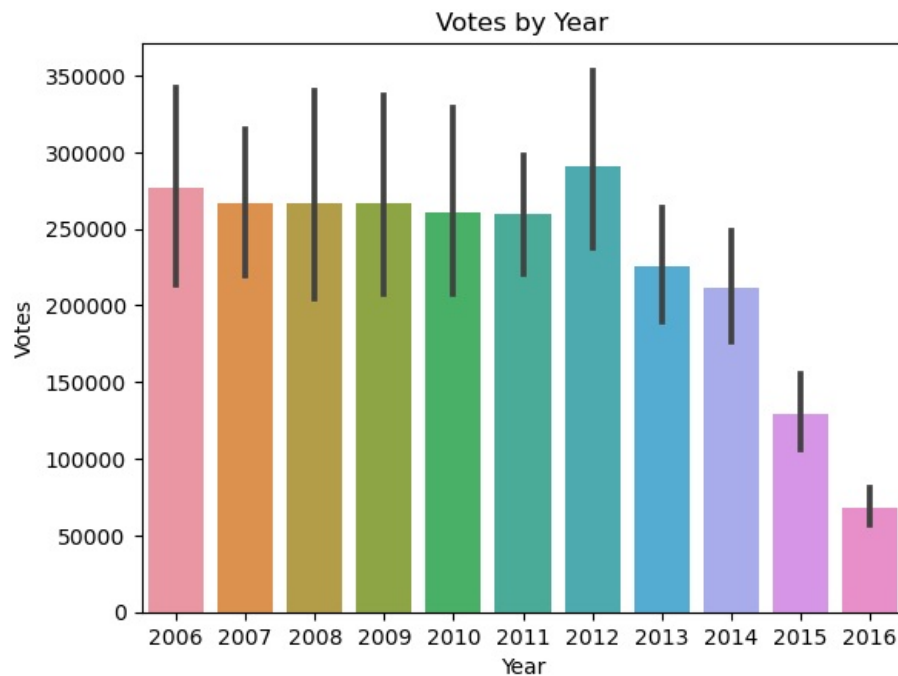
Out[18]:	Rank	Title	Genre	Description	Director	Actors	Year	Runtime (Minutes)	Rating	Votes	Revenue (Millions)
count	838.000000	838		838	838	838	838.000000	838.000000	838.000000	8.380000e+02	838.000000
unique	NaN	837		189	838	524	NaN	NaN	NaN	NaN	NaN
top	NaN	The Host	Action,Adventure,Sci-Fi	A group of intergalactic criminals are forced ...	Ridley Scott	Jennifer Lawrence, Josh Hutcherson, Liam Hemsw...	NaN	NaN	NaN	NaN	NaN
freq	NaN	2		50	1	8	2	NaN	NaN	NaN	NaN
mean	485.247017	NaN		NaN	NaN	NaN	2012.50716	114.638425	6.814320	1.932303e+05	84.5640
std	286.572065	NaN		NaN	NaN	NaN	3.17236	18.470922	0.877754	1.930990e+05	104.5200
min	1.000000	NaN		NaN	NaN	NaN	2006.00000	66.000000	1.900000	1.780000e+02	0.0000
25%	238.250000	NaN		NaN	NaN	NaN	2010.00000	101.000000	6.300000	6.127650e+04	13.9670
50%	475.500000	NaN		NaN	NaN	NaN	2013.00000	112.000000	6.900000	1.368795e+05	48.1500
75%	729.750000	NaN		NaN	NaN	NaN	2015.00000	124.000000	7.500000	2.710830e+05	116.8000
max	1000.000000	NaN		NaN	NaN	NaN	2016.00000	187.000000	9.000000	1.791916e+06	936.6300

9. Display Title of The Movie Having Runtime >= 180 Minutes

```
In [19]: df.columns
Out[19]: Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',
        'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',
        'Metascore'],
        dtype='object')
In [20]: df['Title'][df['Runtime (Minutes)']>=180]
Out[20]: 82    The Wolf of Wall Street
88    The Hateful Eight
311    La vie d'Adèle
Name: Title, dtype: object
```

10. In Which Year There Was The Highest Average Voting?

```
In [21]: df.groupby('Year')['Votes'].mean().sort_values(ascending=False)
Out[21]: Year
2012    290861.483871
2006    277232.219512
2009    267180.577778
2008    266580.145833
2007    266530.704545
2010    261082.929825
2011    259254.736842
2013    225531.892857
2014    211926.881720
2015    129512.651376
2016     68437.823232
Name: Votes, dtype: float64
In [22]: sns.barplot(x='Year', y='Votes', data=df)
plt.title('Votes by Year')
plt.show()
```

11. In Which Year There Was The Highest Average Revenue?

In [23]: `df.columns`

Out[23]: Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',
'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',
'Metascore'],
dtype='object')

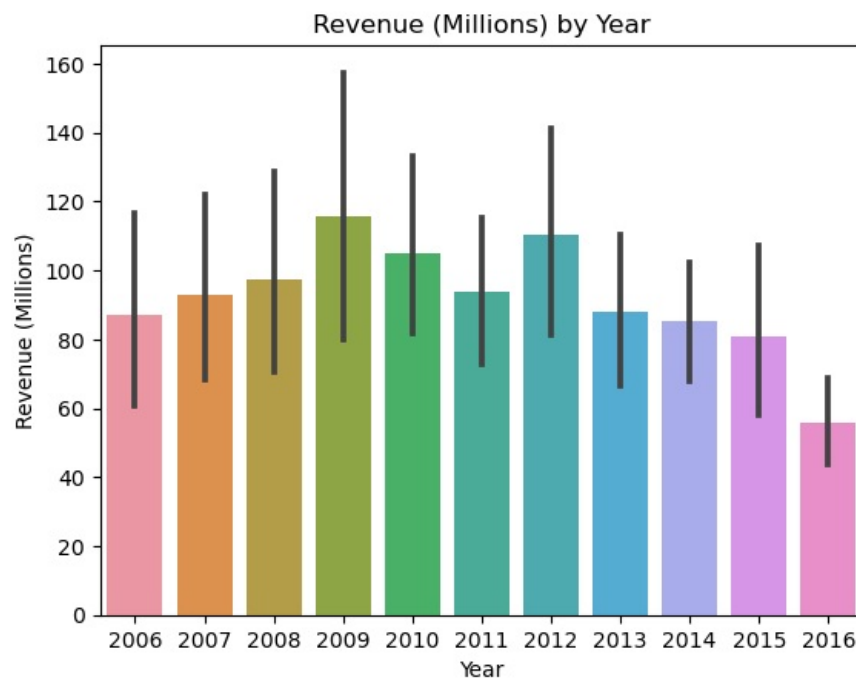
In [24]: `df.groupby('Year')['Revenue (Millions)'].mean().sort_values(ascending=False)`

Out[24]:

Year	
2009	115.742000
2012	110.103065
2010	105.081579
2008	97.525417
2011	93.703333
2007	93.074091
2013	88.084643
2006	87.255610
2014	85.433656
2015	80.725596
2016	55.566111

Name: Revenue (Millions), dtype: float64

In [25]: `sns.barplot(x='Year', y='Revenue (Millions)', data=df)`
`plt.title('Revenue (Millions) by Year')`
`plt.show()`



12. Find The Average Rating For Each Director

```
In [26]: df.columns
```

```
Out[26]: Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',  
              'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',  
              'Metascore'],  
            dtype='object')
```

```
In [161]: df.groupby('Director')['Rating'].mean().sort_values(ascending=False)
```

```
Out[161]: Director  
Christopher Nolan            8.68  
Olivier Nakache              8.60  
Makoto Shinkai               8.60  
Florian Henckel von Donnersmarck  8.50  
Aamir Khan                   8.50  
...  
Sam Taylor-Johnson           4.10  
Joey Curtis                  4.00  
George Nolfi                 3.90  
James Wong                   2.70  
Jason Friedberg              1.90  
Name: Rating, Length: 524, dtype: float64
```

13. Display Top 10 Lengthy Movies Title and Runtime

```
In [28]: df.columns
```

```
Out[28]: Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',  
              'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',  
              'Metascore'],  
            dtype='object')
```

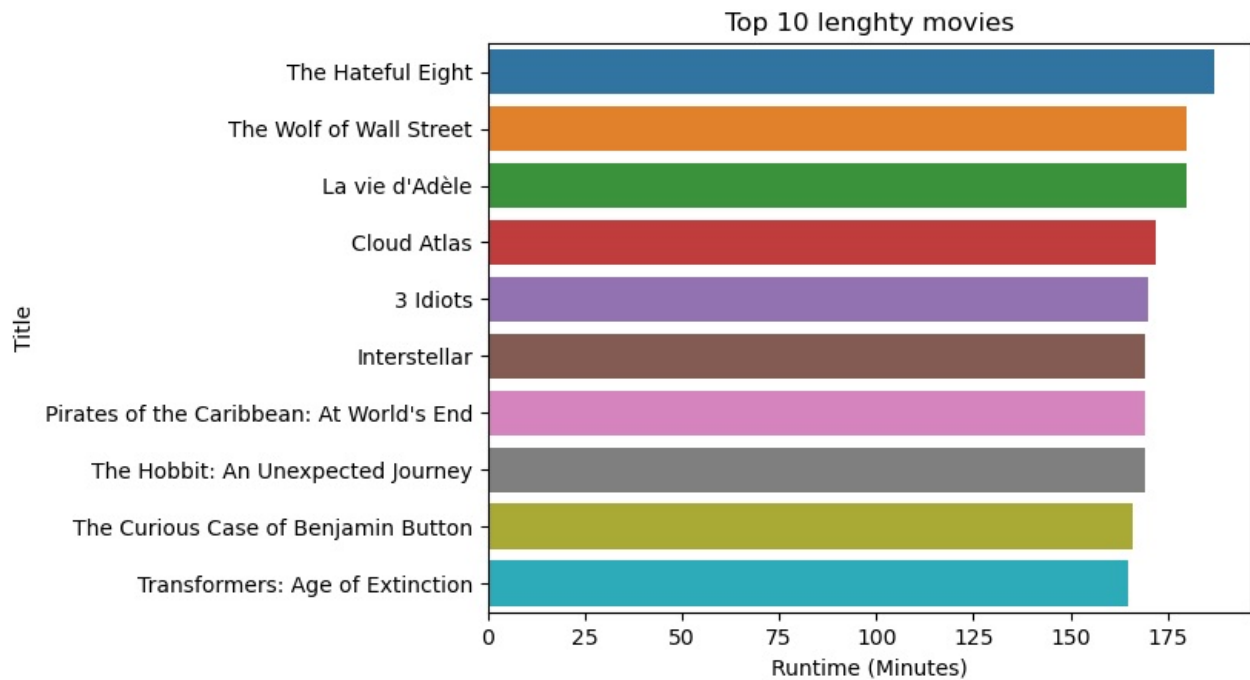
```
In [71]: Top10_lengthy_movies = df.nlargest(10, 'Runtime (Minutes)')[['Title', 'Runtime (Minutes)']].set_index('Title')
```

```
In [73]: Top10_lengthy_movies
```

```
Out[73]:
```

	Runtime (Minutes)
Title	
The Hateul Eight	187
The Wolf of Wall Street	180
La vie d'Adèle	180
Cloud Atlas	172
3 Idiots	170
Interstellar	169
Pirates of the Caribbean: At World's End	169
The Hobbit: An Unexpected Journey	169
The Curious Case of Benjamin Button	166
Transformers: Age of Extinction	165

```
In [61]: #visualization of the Top 10 lengthy movies  
sns.barplot(x='Runtime (Minutes)', y= Top10_lengthy_movies.index, data= Top10_lengthy_movies)  
plt.title("Top 10 lengthy movies")  
plt.show()
```



14. Display Number of Movies Per Year

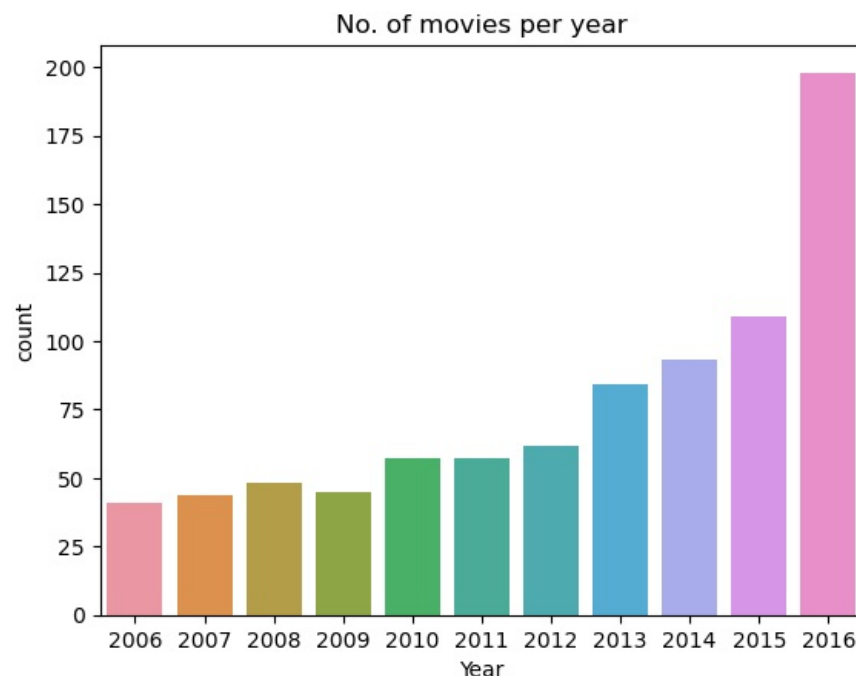
```
In [47]: df.columns
```

```
Out[47]: Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',
        'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',
        'Metascore'],
        dtype='object')
```

```
In [56]: df['Year'].value_counts(ascending=True)
```

```
Out[56]: Year
2006      41
2007      44
2009      45
2008      48
2011      57
2010      57
2012      62
2013      84
2014      93
2015     109
2016     198
Name: count, dtype: int64
```

```
In [60]: sns.countplot(x='Year', data=df)
plt.title("No. of movies per year")
plt.show()
```



15. Find Most Popular Movie Title (Highest Revenue)

```
In [63]: df.nlargest(1, 'Revenue (Millions)')['Title']
```

```
Out[63]: 50    Star Wars: Episode VII - The Force Awakens  
Name: Title, dtype: object
```

16. Display Top 10 Highest Rated Movie Titles And its Directors

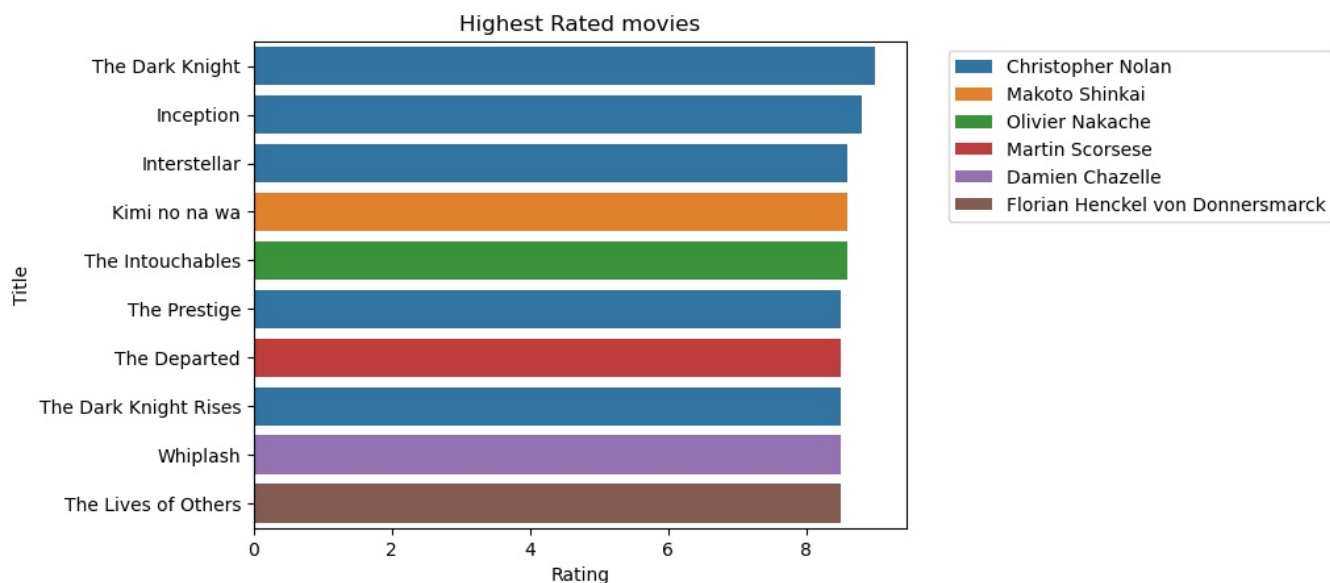
```
In [75]: Top10_highest_rated = df.nlargest(10, 'Rating')[['Title', 'Director', 'Rating']].set_index('Title')
```

```
In [76]: Top10_highest_rated
```

```
Out[76]:
```

	Director	Rating
Title		
The Dark Knight	Christopher Nolan	9.0
Inception	Christopher Nolan	8.8
Interstellar	Christopher Nolan	8.6
Kimi no na wa	Makoto Shinkai	8.6
The Intouchables	Olivier Nakache	8.6
The Prestige	Christopher Nolan	8.5
The Departed	Martin Scorsese	8.5
The Dark Knight Rises	Christopher Nolan	8.5
Whiplash	Damien Chazelle	8.5
The Lives of Others	Florian Henckel von Donnersmarck	8.5

```
In [91]: sns.barplot(x='Rating', y=Top10_highest_rated.index, data=Top10_highest_rated, hue='Director', dodge=False)  
plt.legend(bbox_to_anchor=(1.05,1), loc=2)  
plt.title("Highest Rated movies")  
plt.show()
```



17. Display Top 10 Highest Revenue Movie Titles

```
In [92]: df.columns
```

```
Out[92]: Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',  
              'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',  
              'Metascore'],  
              dtype='object')
```

```
In [97]: Top10_Highest_Revenue = df.nlargest(10, 'Revenue (Millions)')[['Title', 'Revenue (Millions)']].set_index('Title')
```

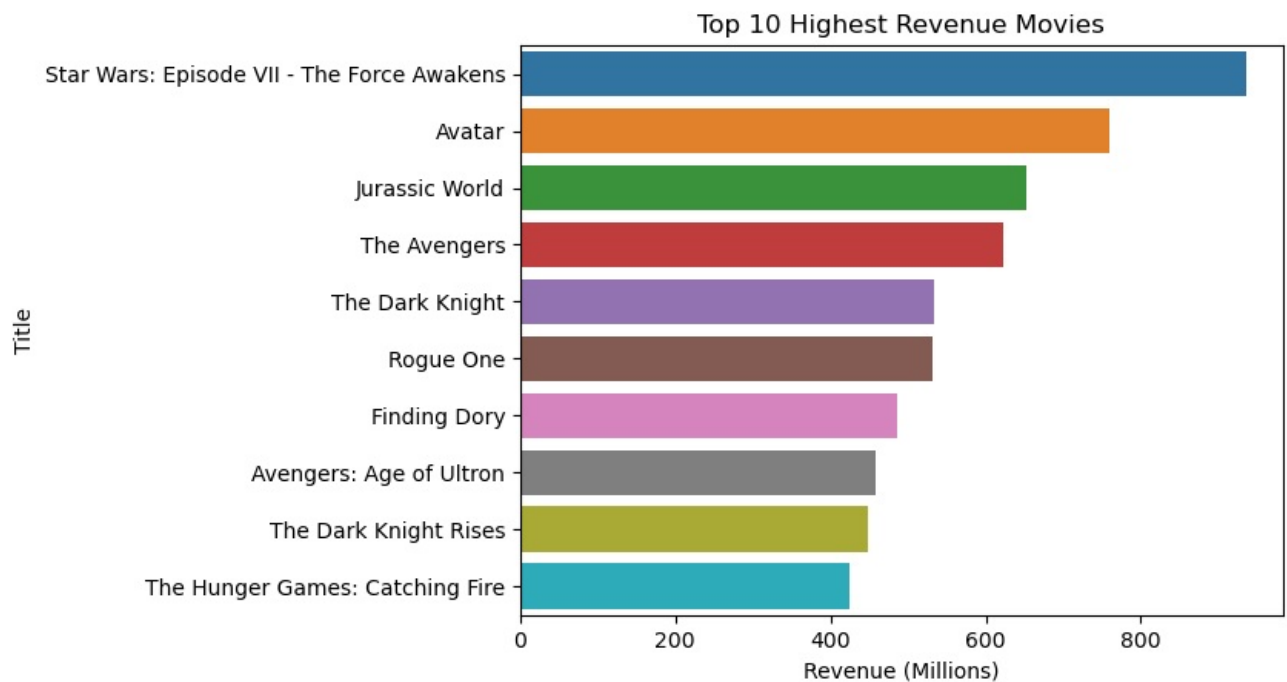
```
In [98]: Top10_Highest_Revenue
```

Out[98]:

Revenue (Millions)	
Title	
Star Wars: Episode VII - The Force Awakens	936.63
Avatar	760.51
Jurassic World	652.18
The Avengers	623.28
The Dark Knight	533.32
Rogue One	532.17
Finding Dory	486.29
Avengers: Age of Ultron	458.99
The Dark Knight Rises	448.13
The Hunger Games: Catching Fire	424.65

In [104]:

```
sns.barplot(x='Revenue (Millions)', y=Top10_Highest_Revenue.index, data=Top10_Highest_Revenue)
plt.title("Top 10 Highest Revenue Movies")
plt.show()
```



18. Find Average Rating of Movies Year Wise

In [109]:

```
df.groupby('Year')['Rating'].mean().sort_values(ascending=False)
```

Out[109]:

```
Year
2006    7.143902
2007    7.140909
2011    6.945614
2012    6.933871
2009    6.911111
2010    6.894737
2013    6.832143
2014    6.822581
2008    6.708333
2015    6.674312
2016    6.644444
Name: Rating, dtype: float64
```

19. Does Rating Affect The Revenue?

In [111]:

```
df.columns
```

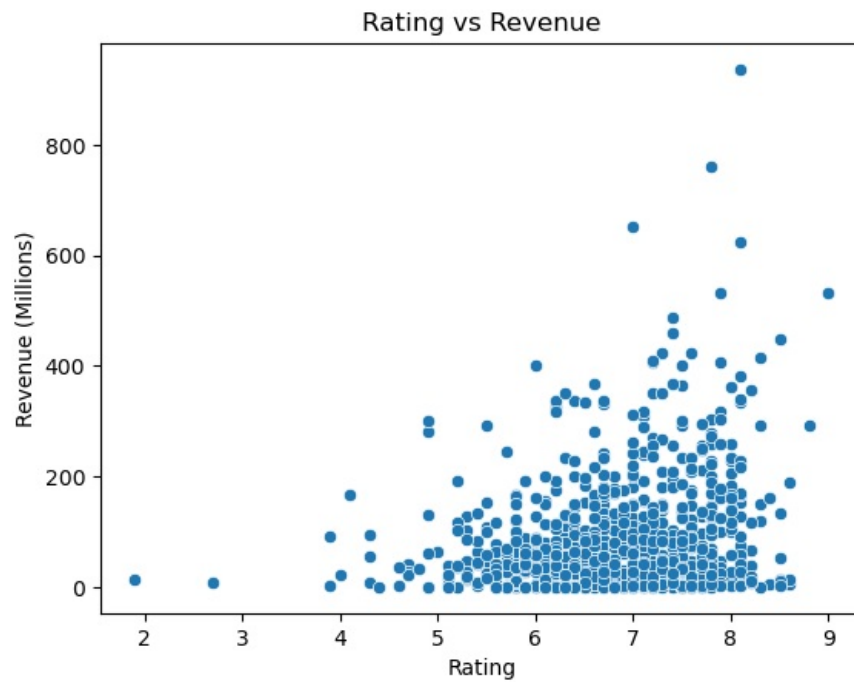
Out[111]:

```
Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',
      'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',
      'Metascore'],
      dtype='object')
```

In [113]:

```
sns.scatterplot(x='Rating', y='Revenue (Millions)', data=df)
plt.title('Rating vs Revenue')
plt.show()
```

```
# Yes, Rating does affect the Revenue. when Rating high then Revenue is high.
```



20. Classify Movies Based on Ratings [Excellent, Good and Average]

```
In [115]: df.columns
```

```
Out[115]: Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',  
          'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',  
          'Metascore'],  
          dtype='object')
```

```
In [117]: def is_rating(rating):  
          if rating >= 8.0:  
              return "Excellent"  
          elif rating >= 6.0:  
              return "Good"  
          else:  
              return "Average"
```

```
In [118]: df['Rating_category'] = df['Rating'].apply(is_rating)
```

```
In [120]: df.head()
```

```
Out[120]:
```

	Rank	Title	Genre	Description	Director	Actors	Year	Runtime (Minutes)	Rating	Votes	Revenue (Millions)	Meta
0	1	Guardians of the Galaxy	Action,Adventure,Sci-Fi	A group of intergalactic criminals are forced ...	James Gunn	Chris Pratt, Vin Diesel, Bradley Cooper, Zoe S...	2014	121	8.1	757074	333.13	
1	2	Prometheus	Adventure,Mystery,Sci-Fi	Following clues to the origin of mankind, a te...	Ridley Scott	Noomi Rapace, Logan Marshall-Green, Michael Fa...	2012	124	7.0	485820	126.46	
2	3	Split	Horror,Thriller	Three girls are kidnapped by a man with a diag...	M. Night Shyamalan	James McAvoy, Anya Taylor-Joy, Haley Lu Richar...	2016	117	7.3	157606	138.12	
3	4	Sing	Animation,Comedy,Family	In a city of humanoid animals, a hustling thea...	Christophe Lourdelet	Matthew McConaughey,Reese Witherspoon, Seth Ma...	2016	108	7.2	60545	270.32	
4	5	Suicide Squad	Action,Adventure,Fantasy	A secret government agency recruits some of th...	David Ayer	Will Smith, Jared Leto, Margot Robbie, Viola D...	2016	123	6.2	393727	325.02	

21. Count Number of Action Movies

```
In [121] df.columns
Out[121]: Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',
              'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',
              'Metascore', 'Rating_category'],
              dtype='object')

In [126] df['Genre'].dtype
Out[126]: dtype('O')

In [133] cnt = len(df[df['Genre'].str.contains('Action', case=False)]) #case=False - case insensitive
          print("The no. of action movies are :",cnt)
The no. of action movies are : 277
```

22. Find Unique Values From Genre

```
In [135] df.columns
Out[135]: Index(['Rank', 'Title', 'Genre', 'Description', 'Director', 'Actors', 'Year',
              'Runtime (Minutes)', 'Rating', 'Votes', 'Revenue (Millions)',
              'Metascore', 'Rating_category'],
              dtype='object')

In [139] df['Genre']
Out[139]: <bound method Series.unique of 0          Action,Adventure,Sci-Fi
1          Adventure,Mystery,Sci-Fi
2              Horror,Thriller
3          Animation,Comedy,Family
4          Action,Adventure,Fantasy
...
993        Action,Adventure,Horror
994              Comedy
996              Horror
997          Drama,Music,Romance
999        Comedy,Family,Fantasy
Name: Genre, Length: 838, dtype: object>

In [140] # created one list for all the values
          list1=[]
          for value in df['Genre']:
              list1.append(value.split(','))
```

```
In [141] list1
Out[141]: [['Action', 'Adventure', 'Sci-Fi'],
           ['Adventure', 'Mystery', 'Sci-Fi'],
           ['Horror', 'Thriller'],
           ['Animation', 'Comedy', 'Family'],
           ['Action', 'Adventure', 'Fantasy'],
           ['Action', 'Adventure', 'Fantasy'],
           ['Comedy', 'Drama', 'Music'],
           ['Action', 'Adventure', 'Biography'],
           ['Adventure', 'Drama', 'Romance'],
           ['Adventure', 'Family', 'Fantasy'],
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           ['Action', 'Adventure', 'Sci-Fi'],
           ['Adventure', 'Drama', 'Sci-Fi'],
           ['Action', 'Adventure', 'Fantasy'],
           ['Action', 'Adventure', 'Western']]
```

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In [143]: *# all the values append in only one list*

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one_list=[]  
for item in list1:  
    for item1 in item:  
        one_list.append(item1)
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In [144]: one_list

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Out[144]: ['Action',  
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'Adventure',
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'Drama',
'Action',
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'Action',
'Horror',
'Romance',
'Action',
'Drama',
'Fantasy',
'Action',
'Crime',
'Drama',
'Drama',
'Fantasy',
'Romance',
...]
```

```
In [148.. unique_val=[]
for val in one_list:
    if val not in unique_val:
        unique_val.append(val)
```

```
In [150.. unique_val
```

```
Out[150]: ['Action',
'Adventure',
'Sci-Fi',
'Mystery',
'Horror',
'Thriller',
'Animation',
'Comedy',
'Family',
'Fantasy',
'Drama',
'Music',
'Biography',
'Romance',
'History',
'Western',
'Crime',
'War',
'Musical',
'Sport']
```

```
In [152.. print(f"Count of unique values from 'Genre' is {len(unique_val)}")
```

Count of unique values from 'Genre' is 20

23. How Many Films of Each Genre Were Made?

```
In [153.. # all the values append in only one list
one_list=[]
for item in list1:
    for item1 in item:
        one_list.append(item1)
```

```
In [156.. print(one_list, end="")
```

```
['Action', 'Adventure', 'Sci-Fi', 'Adventure', 'Mystery', 'Sci-Fi', 'Horror', 'Thriller', 'Animation', 'Comedy',
'Family', 'Action', 'Adventure', 'Fantasy', 'Action', 'Adventure', 'Fantasy', 'Comedy', 'Drama', 'Music', 'Ac
tion', 'Adventure', 'Biography', 'Adventure', 'Drama', 'Romance', 'Adventure', 'Family', 'Fantasy', 'Biography',
'Drama', 'History', 'Action', 'Adventure', 'Sci-Fi', 'Animation', 'Adventure', 'Comedy', 'Action', 'Comedy',
'Drama', 'Animation', 'Adventure', 'Comedy', 'Biography', 'Drama', 'History', 'Action', 'Thriller', 'Biography',
'Drama', 'Drama', 'Mystery', 'Sci-Fi', 'Adventure', 'Drama', 'Thriller', 'Drama', 'Animation', 'Adventure', '
Comedy', 'Action', 'Adventure', 'Sci-Fi', 'Comedy', 'Action', 'Adventure', 'Drama', 'Comedy', 'Drama', 'Thrille
r', 'Action', 'Adventure', 'Sci-Fi', 'Action', 'Adventure', 'Comedy', 'Action', 'Horror', 'Sci-Fi', 'Action', '']
```

Adventure', 'Sci-Fi', 'Adventure', 'Drama', 'Sci-Fi', 'Action', 'Adventure', 'Fantasy', 'Action', 'Adventure', 'Western', 'Animation', 'Adventure', 'Comedy', 'Drama', 'Biography', 'Drama', 'History', 'Drama', 'Action', 'Adventure', 'Fantasy', 'Drama', 'Thriller', 'Action', 'Adventure', 'Sci-Fi', 'Action', 'Adventure', 'Fantasy', 'Action', 'Adventure', 'Fantasy', 'Comedy', 'Drama', 'Action', 'Crime', 'Thriller', 'Action', 'Crime', 'Drama', 'Adventure', 'Drama', 'History', 'Crime', 'Horror', 'Thriller', 'Drama', 'Romance', 'Comedy', 'Drama', 'Romance', 'Biography', 'Drama', 'Action', 'Adventure', 'Sci-Fi', 'Crime', 'Drama', 'Mystery', 'Drama', 'Romance', 'Thriller', 'Drama', 'Mystery', 'Sci-Fi', 'Action', 'Adventure', 'Comedy', 'Drama', 'History', 'Thriller', 'Action', 'Adventure', 'Sci-Fi', 'Drama', 'Action', 'Drama', 'Thriller', 'Action', 'Drama', 'Romance', 'Drama', 'Fantasy', 'Drama', 'Romance', 'Animation', 'Adventure', 'Comedy', 'Action', 'Adventure', 'Fantasy', 'Action', 'Sci-Fi', 'Adventure', 'Drama', 'War', 'Action', 'Adventure', 'Fantasy', 'Action', 'Comedy', 'Fantasy', 'Action', 'Adventure', 'Sci-Fi', 'Comedy', 'Biography', 'Comedy', 'Crime', 'Drama', 'Mystery', 'Action', 'Crime', 'Drama', 'Mystery', 'Action', 'Crime', 'Drama', 'Crime', 'Drama', 'Mystery', 'Action', 'Adventure', 'Fantasy', 'Drama', 'Comedy', 'Crime', 'Drama', 'Action', 'Adventure', 'Sci-Fi', 'Action', 'Comedy', 'Crime', 'Animation', 'Drama', 'Fantasy', 'Horror', 'Mystery', 'Sci-Fi', 'Drama', 'Mystery', 'Thriller', 'Crime', 'Drama', 'Thriller', 'Biography', 'Crime', 'Drama', 'Action', 'Adventure', 'Fantasy', 'Adventure', 'Drama', 'Sci-Fi', 'Action', 'Adventure', 'Comedy', 'Crime', 'Drama', 'Thriller', 'Comedy', 'Action', 'Adventure', 'Drama', 'Drama', 'Mystery', 'Sci-Fi', 'Action', 'Horror', 'Thriller', 'Biography', 'Drama', 'History', 'Action', 'Fantasy', 'War', 'Adventure', 'Comedy', 'Adventure', 'Drama', 'Family', 'Adventure', 'Mystery', 'Animation', 'Adventure', 'Comedy', 'Action', 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'Romance', 'Animation', 'Comedy', 'Family', 'Comedy', 'Drama', 'Comedy', 'Drama', 'Biography', 'Drama', 'Sport', 'Action', 'Adventure', 'Fantasy', 'Action', 'Drama', 'History', 'Action', 'Adventure', 'Sci-Fi', 'Action', 'Adventure', 'Mystery', 'Crime', 'Drama', 'Mystery', 'Action', 'Comedy', 'Romance', 'Comedy', 'Drama', 'Romance', 'Biography', 'Drama', 'Sport', 'Action', 'Fantasy', 'Thriller', 'Biography', 'Crime', 'Drama', 'Comedy', 'Drama', 'Romance', 'Action', 'Crime', 'Drama', 'Sci-Fi', 'Action', 'Comedy', 'Romance', 'Adventure', 'Comedy', 'Drama', 'Comedy', 'Crime', 'Drama', 'Action', 'Fantasy', 'Horror', 'Drama', 'Horror', 'Horror', 'Action', 'Thriller', 'Action', 'Adventure', 'Mystery', 'Action', 'Adventure', 'Fantasy', 'Adventure', 'Comedy', 'Family', 'Comedy', 'Drama', 'Romance', 'Comedy', 'Drama', 'Horror', 'Drama', 'Thriller', 'Drama', 'History', 'War', 'Comedy', 'Drama', 'Action', 'Comedy', 'Fantasy', 'Drama', 'Horror', 'Musical', 'Horror', 'Mystery', 'Thriller', 'Comedy', 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'Drama', 'Romance', 'Crime', 'Drama', 'Crime', 'Drama', 'Mystery', 'Action', 'Adventure', 'Sci-Fi', 'Animation', 'Fantasy', 'Animation', 'Adventure', 'Comedy', 'Drama', 'Mystery', 'War', 'Comedy', 'Romance', 'Animation', 'Comedy', 'Family', 'Comedy', 'Horror', 'Mystery', 'Thriller', 'Action', 'Adventure', 'Comedy', 'Thriller', 'Comedy', 'Adventure', 'Comedy', 'Sci-Fi', 'Mystery', 'Thriller', 'Comedy', 'Drama', 'Adventure', 'Drama', 'Family', 'Horror', 'Thriller', 'Action', 'Drama', 'Romance', 'Drama', 'Romance', 'Action', 'Adventure', 'Fantasy', 'Comedy', 'Action', 'Biography', 'Drama', 'Drama', 'Drama', 'Mystery', 'Romance', 'Adventure', 'Drama', 'Western', 'Drama', 'Music', 'Romance', 'Comedy', 'Romance', 'Western', 'Horror', 'Thriller', 'Adventure', 'Family', 'Fantasy', 'Crime', 'Drama', 'Mystery', 'Horror', 'Mystery', 'Comedy', 'Crime', 'Drama', 'Action', 'Comedy', 'Romance', 'Action', 'Biography', 'Drama', 'Drama', 'Music', 'Comedy', 'Drama', 'Drama', 'Thriller', 'War', 'Action', 'Mystery', 'Thriller', 'Horror', 'Sci-Fi', 'Thriller', 'Comedy', 'Drama', 'Romance', 'Action', 'Adventure', 'Fantasy', 'Drama', 'Mystery', 'Romance', 'Drama', 'Action', 'Adventure', 'Thriller', 'Animation', 'Action', 'Adventure', 'Drama', 'Fantasy', 'Mystery', 'Drama', 'Sci-Fi', 'Animation', 'Adventure', 'Comedy', 'Horror', 'Thriller', 'Action', 'Mystery', 'Thriller', 'Action', 'Mystery', 'Sci-Fi', 'Crime', 'Drama', 'Thriller', 'Comedy', 'Drama', 'Romance', 'Biography', 'Drama', 'Thriller', 'Action', 'Adventure', 'Family', 'Animation', 'Comedy', 'Family', 'Action', 'Crime', 'Drama', 'Comedy', 'Comedy', 'Crime', 'Thriller', 'Comedy', 'Romance', 'Animation', 'Comedy', 'Drama', 'Action', 'Crime', 'Thriller', 'Comedy', 'Romance', 'Adventure', 'Biography', 'Drama', 'Animation', 'Adventure', 'Comedy', 'Crime', 'Drama', 'Mystery', 'Action', 'Comedy', 'Sci-Fi', 'Comedy', 'Crime', 'Animation', 'Action', 'Adventure', 'Action', 'Drama', 'Thriller', 'Fantasy', 'Horror', 'Crime', 'Drama', 'Thriller', 'Action', 'Adventure', 'Fantasy', 'Comedy', 'Drama', 'Romance', 'Biography', 'Drama', 'Romance', 'Action', 'Adventure', 'Comedy', 'Horror', 'Thriller', 'Horror', 'Mystery', 'Thriller', 'Comedy', 'Romance', 'Animation', 'Adventure', 'Comedy', 'Crime', 'Drama', 'Mystery', 'Adventure', 'Biography', 'Drama', 'Horror', 'Mystery', 'Thriller', 'Adventure', 'Fantasy', 'Mystery', 'Action', 'Adventure', 'Sci-Fi', 'Biography', 'Drama', 'Comedy', 'Drama', 'Sport', 'Comedy', 'Family', 'Drama', 'Romance', 'Action', 'Adventure', 'Comedy', 'Mystery', 'Romance', 'Thriller', 'Crime', 'Drama', 'Action', 'Comedy', 'Comedy', 'Crime', 'Drama', 'Thriller', 'Drama', 'Animation', 'Adventure', 'Comedy', 'Action', 'Thriller', 'Drama', 'Thriller', 'Animation', 'Adventure', 'Comedy', 'Crime', 'Drama', 'Mystery', 'Biography', 'Drama', 'Sport', 'Crime', 'Drama', 'Thriller', 'Drama', 'Music', 'Crime', 'Drama', 'Thriller', 'Drama', 'Romance', 'Animation', 'Action', 'Adventure', 'Comedy', 'Drama', 'Music', 'Action', 'Adventure', 'Drama', 'Biography', 'Crime', 'Drama', 'Horror', 'Biography', 'Drama', 'Mystery', 'Drama', 'Romance', 'Comedy', 'Family', 'Drama', 'Drama', 'Fantasy', 'Horror', 'Drama', 'Romance', 'Biography', 'Drama', 'History', 'Comedy', 'Family', 'Action', 'Adventure', 'Thriller', 'Comedy', 'Drama', 'Action', 'Adventure', 'Fantasy', 'Action', 'Thriller', 'Drama', 'Romance', 'Comedy', 'Drama', 'Horror', 'Sci-Fi', 'Horror', 'Romance', 'Drama', 'Action', 'Adventure', 'Sci-Fi', 'Action', 'Adventure', 'Fantasy', 'Action', 'Adventure', 'Drama', 'Biography

', 'Comedy', 'Drama', 'Drama', 'Mystery', 'Romance', 'Animation', 'Adventure', 'Comedy', 'Drama', 'Romance', 'Sci-Fi', 'Drama', 'Drama', 'Fantasy', 'Drama', 'Romance', 'Comedy', 'Horror', 'Thriller', 'Comedy', 'Drama', 'Romance', 'Action', 'Drama', 'Family', 'Comedy', 'Drama', 'Romance', 'Action', 'Thriller', 'War', 'Adventure', 'Comedy', 'Drama', 'Comedy', 'Romance', 'Comedy', 'Romance', 'Comedy', 'Drama', 'Romance', 'Action', 'Adventure', 'Crime', 'Comedy', 'Romance', 'Animation', 'Action', 'Adventure', 'Action', 'Crime', 'Sci-Fi', 'Comedy', 'Drama', 'Romance', 'Crime', 'Thriller', 'Comedy', 'Horror', 'Sci-Fi', 'Drama', 'Thriller', 'Drama', 'Fantasy', 'Horror', 'Adventure', 'Drama', 'Family', 'Mystery', 'Sci-Fi', 'Thriller', 'Biography', 'Crime', 'Drama', 'Drama', 'Fantasy', 'Horror', 'Action', 'Adventure', 'Thriller', 'Crime', 'Drama', 'Fantasy', 'Adventure', 'Family', 'Fantasy', 'Action', 'Adventure', 'Drama', 'Action', 'Comedy', 'Horror', 'Comedy', 'Drama', 'Family', 'Action', 'Thriller', 'Action', 'Adventure', 'Sci-Fi', 'Adventure', 'Drama', 'Fantasy', 'Drama', 'Drama', 'Comedy', 'Drama', 'Music', 'Drama', 'Fantasy', 'Music', 'Comedy', 'Horror', 'Action', 'Comedy', 'Sport', 'Horror', 'Comedy', 'Drama', 'Horror', 'Mystery', 'Adventure', 'Drama', 'Fantasy', 'Comedy', 'Romance', 'Action', 'Sci-Fi', 'Thriller', 'Crime', 'Drama', 'Action', 'Adventure', 'Sci-Fi', 'Adventure', 'Comedy', 'Drama', 'Comedy', 'Drama', 'Comedy', 'Drama', 'Romance', 'Adventure', 'Comedy', 'Drama', 'Action', 'Sci-Fi', 'Thriller', 'Comedy', 'Romance', 'Action', 'Fantasy', 'Horror', 'Crime', 'Drama', 'Thriller', 'Action', 'Drama', 'Thriller', 'Crime', 'Drama', 'Mystery', 'Crime', 'Drama', 'Mystery', 'Drama', 'Sci-Fi', 'Thriller', 'Biography', 'Drama', 'History', 'Crime', 'Horror', 'Thriller', 'Horror', 'Thriller', 'Comedy', 'Drama', 'Musical', 'Horror', 'Mystery', 'Biography', 'Drama', 'Sport', 'Comedy', 'Family', 'Romance', 'Drama', 'Thriller', 'Biography', 'Drama', 'Family', 'Comedy', 'Drama', 'Family', 'Drama', 'Fantasy', 'Musical', 'Comedy', 'Adventure', 'Family', 'Adventure', 'Comedy', 'Fantasy', 'Horror', 'Thriller', 'Drama', 'Romance', 'Action', 'Adventure', 'Fantasy', 'Drama', 'Family', 'Music', 'Action', 'Adventure', 'Horror', 'Comedy', 'Horror', 'Drama', 'Music', 'Romance', 'Comedy', 'Family', 'Fantasy']

```
In [159]: #Counter module is used in collections package to count films in each 'Genre'
from collections import Counter
```

```
In [160]: Counter(one_list)
```

```
Out[160]: Counter({'Action': 277,
                  'Adventure': 244,
                  'Sci-Fi': 107,
                  'Mystery': 86,
                  'Horror': 87,
                  'Thriller': 148,
                  'Animation': 45,
                  'Comedy': 250,
                  'Family': 48,
                  'Fantasy': 92,
                  'Drama': 419,
                  'Music': 15,
                  'Biography': 67,
                  'Romance': 120,
                  'History': 25,
                  'Western': 4,
                  'Crime': 126,
                  'War': 10,
                  'Musical': 5,
                  'Sport': 15})
```

IMDB Movie Dataset Analysis Report

Introduction

The IMDB Movie Dataset contains information on 1,000 of the most popular movies during this period. The dataset includes various attributes such as the movie title, genre, description, director, actors, release year, runtime, IMDB rating, number of votes, revenue, and metascore.

Objective

The objective of this analysis is to uncover patterns, trends, and insights from the data, which could help in understanding what factors contribute to a movie's success and popularity.

Data Exploration

Before diving into detailed analysis, an initial exploration of the dataset was conducted:

- 1. **Dataset Overview:** The dataset consists of 1,000 movies with 12 columns. Each row represents a unique movie, and the columns contain various attributes about the movie, such as genre, rating, and revenue.
- 2. **Missing Values:** The dataset contained some missing values in critical columns like revenue and metascore. These were handled by dropping rows with missing data, ensuring the analysis is based on complete information.
- 3. **Duplicates:** A check for duplicate entries was performed, and any duplicates found were removed to avoid skewing the analysis.
- 4. **Statistical Summary:** Basic descriptive statistics were generated for numerical columns like runtime, rating, votes, revenue, and metascore to understand their distribution and central tendencies.

Key Findings

The analysis was structured around several key questions:

1. **Trends in Movie Ratings Over the Years:**

- Movies released between 2006 and 2016 generally maintained high IMDB ratings, with slight fluctuations. No significant downward or upward trends were observed in ratings over time, suggesting a consistent quality of popular movies.

2. **Relationship Between Runtime and Ratings:**

- A moderate correlation was observed between the runtime of movies and their IMDB ratings. Generally, movies with longer runtimes tended to have slightly higher ratings, possibly indicating that more complex, detailed stories are appreciated by viewers.

3. **Revenue Distribution and Its Correlation with Ratings:**

- The analysis revealed a positive correlation between movie ratings and revenue. Generally, movies with higher ratings tended to generate higher revenue. This suggests that higher-quality movies, as reflected by their ratings, are more likely to achieve commercial success.

4. **Analysis of Genres and Their Popularity:**

- The genre analysis revealed that certain genres, such as Action, Drama, and Adventure, were more prevalent among popular movies. However, no single genre consistently outperformed others in terms of ratings, indicating that a wide variety of genres resonate with audiences.

5. **Impact of Directors on Movie Ratings:**

- Christopher Nolan's movie achieved a high rating of 8.68, highlighting the significant impact of a renowned director on a film's success.

6. **Top 5 Highest Revenue Movies are:**

- Movies with Revenue 1] Star Wars: Episode VII - The Force Awakens 936.63 2] Avatar 760.51 3] Jurassic World 652.18 4] The Avengers 623.28 5] The Dark Knight 533.32

Conclusion

This analysis of the IMDB Movie Dataset from 2006 to 2016 provides several insights into the dynamics of popular movies. Movies directed by well-known directors, such as Christopher Nolan, tend to receive higher ratings, as evidenced by Nolan's movie achieving a rating of 8.68. Additionally, movies with higher ratings generally generate higher revenue, underscoring the importance of quality in commercial success. Finally, the variety in genres among popular movies suggests that audience preferences are diverse, and success is not confined to a specific genre.