```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
```

```
df = pd.read_csv(("/content/IMDb Movies India.csv"),encoding='unicode_escape')
df.head(11)
```

	Name	Year	Duration	Genre	Rating	Votes	Director	Actor 1	Actor 2	Actor 3
0		NaN	NaN	Drama	NaN	NaN	J.S. Randhawa	Manmauji	Birbal	Rajendra Bhatia
1	#Gadhvi (He thought he was Gandhi)	(2019)	109 min	Drama	7.0	8	Gaurav Bakshi	Rasika Dugal	Vivek Ghamande	Arvind Jangid
2	#Homecoming	(2021)	90 min	Drama, Musical	NaN	NaN	Soumyajit Majumdar	Sayani Gupta	Plabita Borthakur	Roy Angana
3	#Yaaram	(2019)	110 min	Comedy, Romance	4.4	35	Ovais Khan	Prateik	Ishita Raj	Siddhant Kapoor
4	...And Once Again	(2010)	105 min	Drama	NaN	NaN	Amol Palekar	Rajat Kapoor	Rituparna Sengupta	Antara Mali
5	...Aur Pyaar Ho Gaya	(1997)	147 min	Comedy, Drama, Musical	4.7	827	Rahul Rawail	Bobby Deol	Aishwarya Rai Bachchan	Shammi Kapoor
6	...Yahaan	(2005)	142 min	Drama, Romance, War	7.4	1,086	Shoojit Sircar	Jimmy Sheirgill	Minissha Lamba	Yashpal Sharma
7	.in for Motion	(2008)	59 min	Documentary	NaN	NaN	Anirban Datta	NaN	NaN	NaN
8	?: A Question Mark	(2012)	82 min	Horror, Mystery, Thriller	5.6	326	Allyson Patel	Yash Dave	Muntazir Ahmad	Kiran Bhatia
9	@Andheri	(2014)	116 min	Action, Crime, Thriller	4.0	11	Biju Bhaskar Nair	Augustine	Fathima Babu	Byon
10	1:1.6 An Ode to Lost Love	(2004)	96 min	Drama	6.2	17	Madhu Ambat	Rati Agnihotri	Gulshan Grover	Atul Kulkarni

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
df.shape
```

```
(15509, 10)
```

```
df.isnull().sum()
```

	0
Name	0
Year	528
Duration	8269
Genre	1877
Rating	7590
Votes	7589
Director	525
Actor 1	1617
Actor 2	2384
Actor 3	3144

dtype: int64

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 15509 entries, 0 to 15508
Data columns (total 10 columns):
 #   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   Name      15509 non-null  object
 1   Year      14981 non-null  object
 2   Duration  7240 non-null   object
 3   Genre     13632 non-null  object
 4   Rating    7919 non-null   float64
 5   Votes     7920 non-null   object
 6   Director  14984 non-null  object
 7   Actor 1   13892 non-null  object
 8   Actor 2   13125 non-null  object
 9   Actor 3   12365 non-null  object
dtypes: float64(1), object(9)
memory usage: 1.2+ MB
```

```
df.describe()
```

	Rating
count	7919.000000
mean	5.841621
std	1.381777
min	1.100000
25%	4.900000
50%	6.000000
75%	6.800000
max	10.000000

```
df.duplicated().sum()
```

```
6
```

```
df.shape
```

```
(15509, 10)
```

```
df.dropna(inplace=True)
df.isnull().sum()
```

	0
Name	0
Year	0
Duration	0
Genre	0
Rating	0
Votes	0
Director	0
Actor 1	0
Actor 2	0
Actor 3	0

```
df.drop_duplicates(inplace=True)
df.shape
```

```
(5659, 10)
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 5659 entries, 1 to 15508
Data columns (total 10 columns):
 #   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   Name      5659 non-null   object
 1   Year      5659 non-null   object
 2   Duration  5659 non-null   object
 3   Genre     5659 non-null   object
 4   Rating    5659 non-null   float64
 5   Votes     5659 non-null   object
 6   Director  5659 non-null   object
 7   Actor 1   5659 non-null   object
 8   Actor 2   5659 non-null   object
 9   Actor 3   5659 non-null   object
dtypes: float64(1), object(9)
memory usage: 486.3+ KB
```

```
df.describe()
```

	Rating
count	5659.000000
mean	5.898533
std	1.381165
min	1.100000
25%	5.000000
50%	6.100000
75%	6.900000
max	10.000000

```
df.columns
```

```
Index(['Name', 'Year', 'Duration', 'Genre', 'Rating', 'Votes', 'Director',
       'Actor 1', 'Actor 2', 'Actor 3'],
      dtype='object')
```

```
df['Year'] = df['Year'].fillna(0)
df['Year'] = df['Year'].replace(r'[()]', '', regex=True).astype(int)
print(df['Year'])
```

```
1        2019
3        2019
5        1997
6        2005
8        2012
         ...
15493    2015
15494    2001
15503    1989
15505    1999
15508    1998
Name: Year, Length: 5659, dtype: int64
```

```
df['Duration'] = pd.to_numeric(df['Duration'].str.replace(' min', ''))
genres = df['Genre'].value_counts()
genres
```

Genre	count
Drama	844
Drama, Romance	332
Action, Crime, Drama	329
Action, Drama	206
Comedy, Drama	205
...	...
Comedy, Crime, Musical	1
History, Romance	1
Drama, History, Sport	1
Animation, Comedy, Drama	1
Documentary, Biography, Musical	1

376 rows × 1 columns

dtype: int64

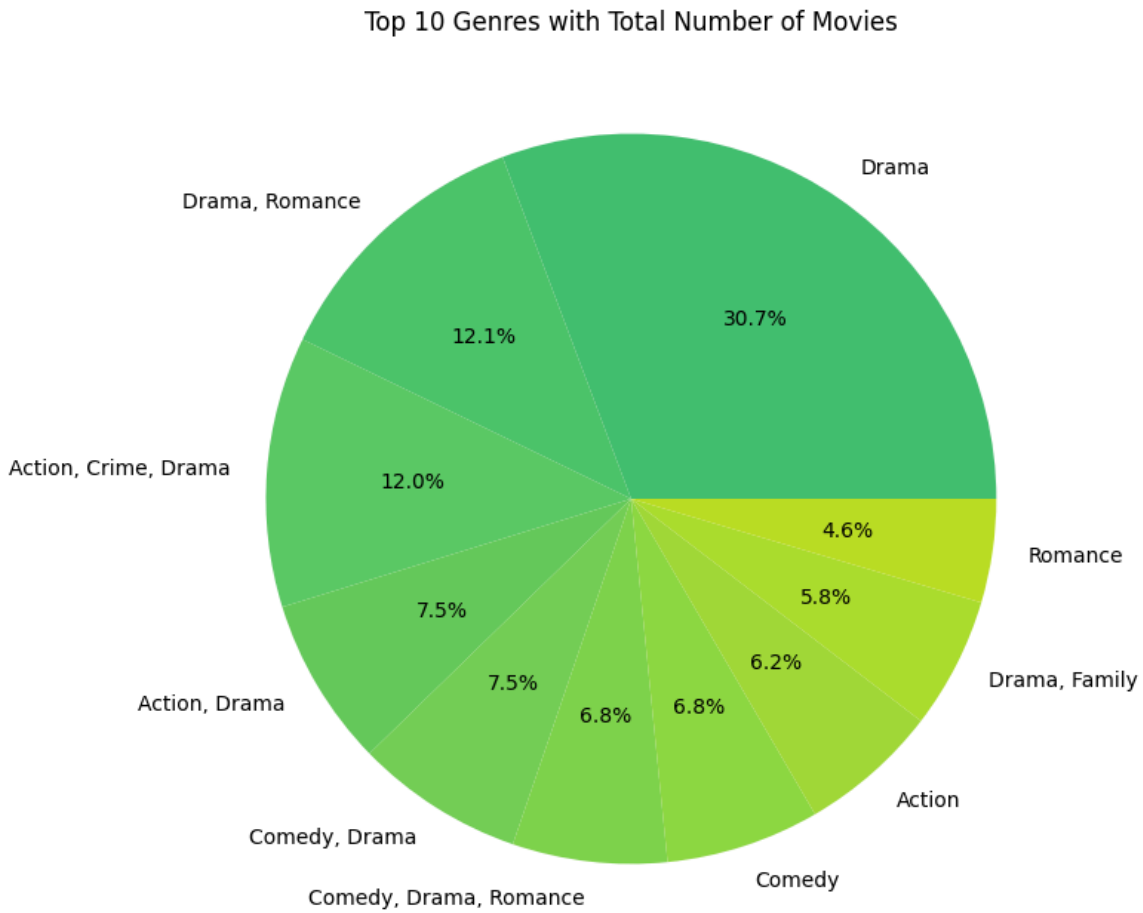
```
df['Genre'] = df['Genre'].str.split(', ')
df = df.explode('Genre')
df['Genre'].fillna(df['Genre'].mode()[0], inplace=True)
top_genres = genres.head(10)
```

```
plt.figure(figsize=(8,8))
colors = plt.cm.viridis(np.linspace(0.7, 0.9, len(top_genres)))
plt.pie(top_genres.values, labels=top_genres.index, autopct='%1.1f%%', colors=colors)
plt.title('Top 10 Genres with Total Number of Movies')
plt.show()
```

```
<ipython-input-17-a61d9522a88c>:3: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignment using an inplace method.
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting values always behaves as a copy.

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].method(value) instead, to perform the ope

  df['Genre'].fillna(df['Genre'].mode()[0], inplace=True)
```

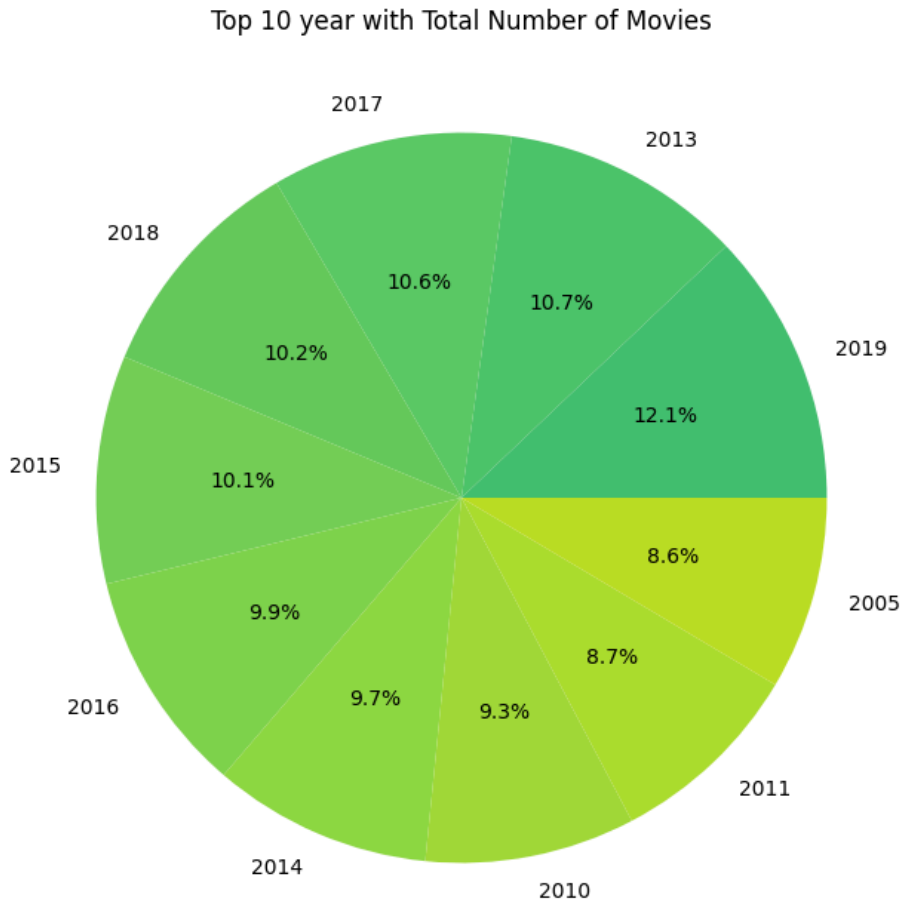


```
Year = df['Year'].value_counts()
Year
```

Year	count
2019	423
2013	374
2017	372
2018	358
2015	353
...	...
1939	4
1931	3
1934	3
1933	2
1932	2

91 rows × 1 columns

```
top_Year = Year.head(10)
plt.figure(figsize=(8,8))
colors = plt.cm.viridis(np.linspace(0.7, 0.9, len(top_Year)))
plt.pie(top_Year.values, labels=top_Year.index, autopct='%1.1f%%', colors=colors)
plt.title('Top 10 year with Total Number of Movies')
plt.show()
```

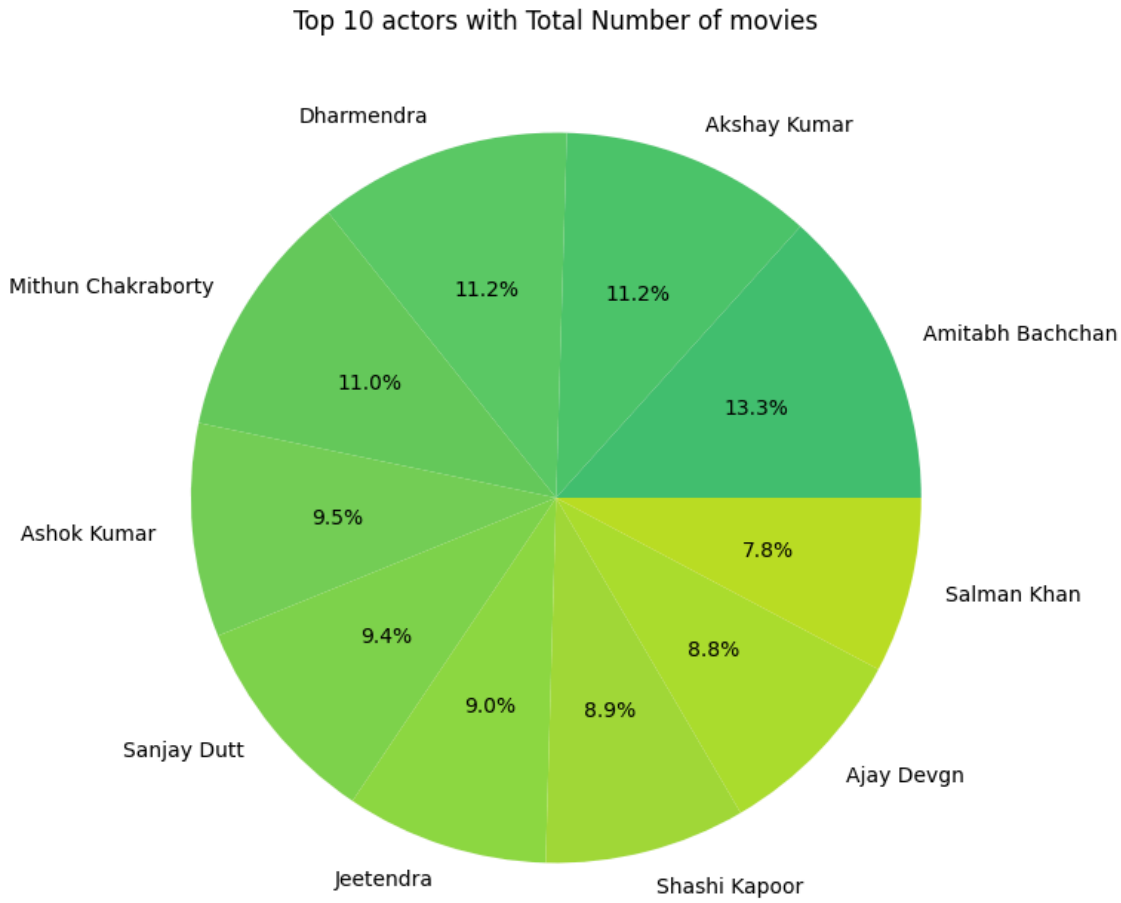



```
actors = pd.concat([df['Actor 1'], df['Actor 2'], df['Actor 3']]).value_counts()
actors
```

	count
Amitabh Bachchan	375
Akshay Kumar	315
Dharmendra	315
Mithun Chakraborty	309
Ashok Kumar	266
...	...
Cedric Cirotteau	1
Nandlal Sharma	1
Kiku Sharda	1
Shivam Tiwari	1
Shatakshi Gupta	1

5041 rows × 1 columns

```
Top_actors = actors.head(10)
plt.figure(figsize=(8,8))
colors = plt.cm.viridis(np.linspace(0.7, 0.9, len(Top_actors)))
plt.pie(Top_actors.values, labels=Top_actors.index, autopct='%1.1f%%', colors=colors)
plt.title('Top 10 actors with Total Number of movies')
plt.show()
```

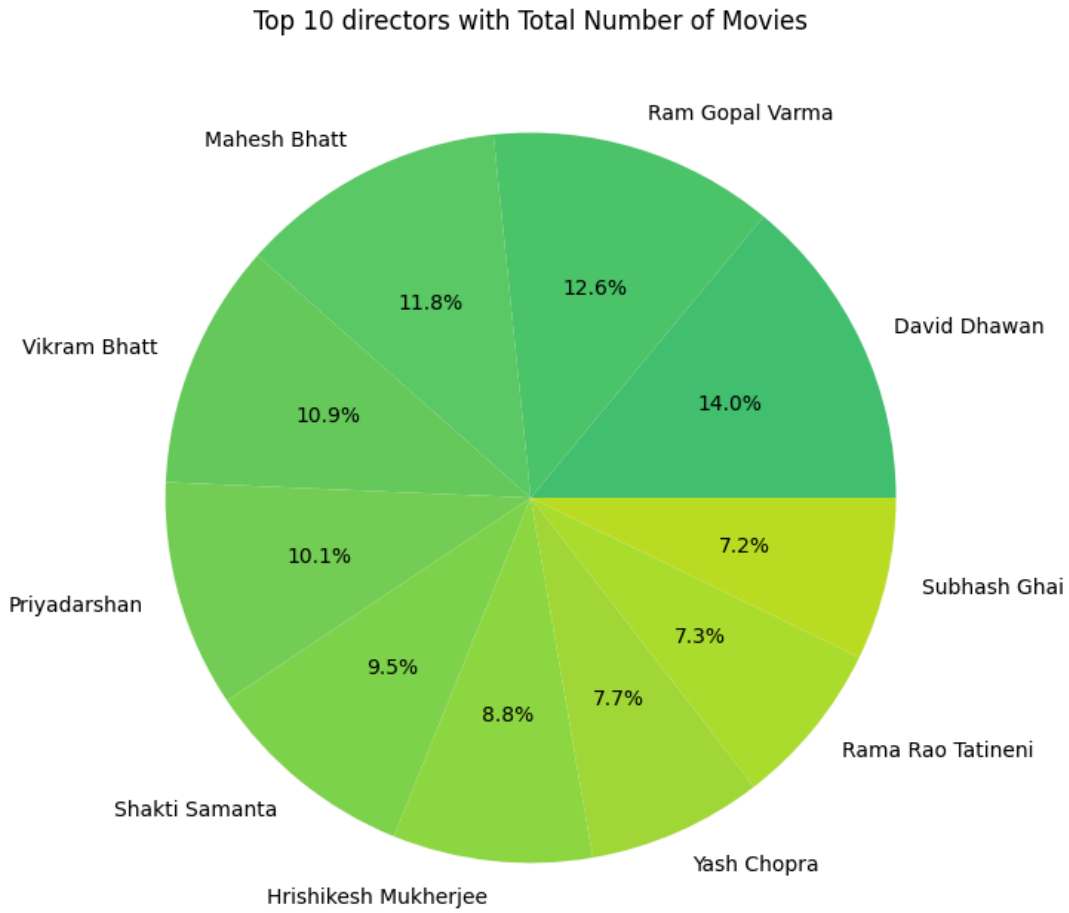



```
directors = df['Director'].value_counts()
directors
```

Director	count
David Dhawan	103
Ram Gopal Varma	93
Mahesh Bhatt	87
Vikram Bhatt	80
Priyadarshan	74
...	...
Hemant Hegde	1
Rohit Dwivedi	1
K.C. Handra	1
Jitendra Chawda	1
Mozez Singh	1

2431 rows × 1 columns

```
Top_directors = directors.head(10)
plt.figure(figsize=(8,8))
colors = plt.cm.viridis(np.linspace(0.7, 0.9, len(Top_directors)))
plt.pie(Top_directors.values, labels=Top_directors.index, autopct='%1.1f%%', colors=colors)
plt.title('Top 10 directors with Total Number of Movies')
plt.show()
```




```
def clean_duration(duration):
  if isinstance(duration, str):
    return float(''.join(filter(str.isdigit, duration)))
  return duration
df['Duration'] = df['Duration'].apply(clean_duration)
df['Votes'] = df['Votes'].astype(str)
df['Votes'] = df['Votes'].str.replace(',', '').astype(int)
df['Year'] = df['Year'].astype(str)
df['Year'] = df['Year'].str.strip('()').astype(int)
df.info()
df
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 11979 entries, 1 to 15508
Data columns (total 10 columns):
 #   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   Name      11979 non-null  object
 1   Year      11979 non-null  int64
 2   Duration  11979 non-null  int64
 3   Genre     11979 non-null  object
 4   Rating    11979 non-null  float64
 5   Votes     11979 non-null  int64
 6   Director  11979 non-null  object
 7   Actor 1   11979 non-null  object
 8   Actor 2   11979 non-null  object
 9   Actor 3   11979 non-null  object
dtypes: float64(1), int64(3), object(6)
memory usage: 1.0+ MB
```

	Name	Year	Duration	Genre	Rating	Votes	Director	Actor 1	Actor 2	Actor 3
1	#Gadhvi (He thought he was Gandhi)	2019	109	Drama	7.0	8	Gaurav Bakshi	Rasika Dugal	Vivek Ghamande	Arvind Jangid
3	#Yaaram	2019	110	Comedy	4.4	35	Ovais Khan	Prateik	Ishita Raj	Siddhant Kapoor
3	#Yaaram	2019	110	Romance	4.4	35	Ovais Khan	Prateik	Ishita Raj	Siddhant Kapoor
5	...Aur Pyaar Ho Gaya	1997	147	Comedy	4.7	827	Rahul Rawail	Bobby Deol	Aishwarya Rai Bachchan	Shammi Kapoor
5	...Aur Pyaar Ho Gaya	1997	147	Drama	4.7	827	Rahul Rawail	Bobby Deol	Aishwarya Rai Bachchan	Shammi Kapoor
...	...	...	...	...	...	...	...	...	...	...
15503	Zulm Ki Zanjeer	1989	125	Drama	5.8	44	S.P. Muthuraman	Chiranjeevi	Jayamalini	Rajinikanth
15505	Zulmi	1999	129	Action	4.5	655	Kuku Kohli	Akshay Kumar	Twinkle Khanna	Aruna Irani
15505	Zulmi	1999	129	Drama	4.5	655	Kuku Kohli	Akshay Kumar	Twinkle Khanna	Aruna Irani
15508	Zulm-O-Sitam	1998	130	Action	6.2	20	K.C. Bokadia	Dharmendra	Jaya Prada	Arjun Sarja
15508	Zulm-O-Sitam	1998	130	Drama	6.2	20	K.C. Bokadia	Dharmendra	Jaya Prada	Arjun Sarja

11979 rows × 10 columns

```
df['Genre'] = df['Genre'].str.split(',')
df = df.explode('Genre')
df['Genre'].fillna(df['Genre'].mode()[0], inplace=True)
print(df.head(10))
```

```
                              Name  Year  Duration    Genre  Rating  Votes  \
1  #Gadhvi (He thought he was Gandhi)  2019       109    Drama     7.0      8
3                            #Yaaram  2019       110   Comedy     4.4     35
3                            #Yaaram  2019       110  Romance     4.4     35
5                ...Aur Pyaar Ho Gaya  1997       147   Comedy     4.7    827
5                ...Aur Pyaar Ho Gaya  1997       147    Drama     4.7    827
5                ...Aur Pyaar Ho Gaya  1997       147  Musical     4.7    827
```

```
6                          ...Yahaan  2005       142    Drama     7.4   1086
6                          ...Yahaan  2005       142  Romance     7.4   1086
6                          ...Yahaan  2005       142      War     7.4   1086
8                  ?: A Question Mark  2012        82   Horror     5.6    326

         Director          Actor 1                Actor 2          Actor 3
1   Gaurav Bakshi     Rasika Dugal          Vivek Ghamande    Arvind Jangid
3      Ovais Khan          Prateik              Ishita Raj  Siddhant Kapoor
3      Ovais Khan          Prateik              Ishita Raj  Siddhant Kapoor
5    Rahul Rawail       Bobby Deol  Aishwarya Rai Bachchan    Shammi Kapoor
5    Rahul Rawail       Bobby Deol  Aishwarya Rai Bachchan    Shammi Kapoor
5    Rahul Rawail       Bobby Deol  Aishwarya Rai Bachchan    Shammi Kapoor
6  Shoojit Sircar  Jimmy Sheirgill          Minissha Lamba   Yashpal Sharma
6  Shoojit Sircar  Jimmy Sheirgill          Minissha Lamba   Yashpal Sharma
6  Shoojit Sircar  Jimmy Sheirgill          Minissha Lamba   Yashpal Sharma
8   Allyson Patel        Yash Dave          Muntazir Ahmad     Kiran Bhatia
<ipython-input-25-ed40bbd15507>:3: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignment using an inplace method.
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting values always behaves as a copy.

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].method(value) instead, to perform the ope


  df['Genre'].fillna(df['Genre'].mode()[0], inplace=True)
```

```
df = df.drop(columns=['Name'])
actor1_encoding_map = df.groupby('Actor 1').agg({'Rating': 'mean'}).to_dict()
actor2_encoding_map = df.groupby('Actor 2').agg({'Rating': 'mean'}).to_dict()
actor3_encoding_map = df.groupby('Actor 3').agg({'Rating': 'mean'}).to_dict()
director_encoding_map = df.groupby('Director').agg({'Rating': 'mean'}).to_dict()
genre_encoding_map = df.groupby('Genre').agg({'Rating': 'mean'}).to_dict()

df['encoded_actor1'] = round(df['Actor 1'].map(actor1_encoding_map['Rating']),1)
df['encoded_actor2'] = round(df['Actor 2'].map(actor2_encoding_map['Rating']),1)
df['encoded_actor3'] = round(df['Actor 3'].map(actor3_encoding_map['Rating']),1)
df['encoded_director'] = round(df['Director'].map(director_encoding_map['Rating']),1)
df['encoded_genre'] = round(df['Genre'].map(genre_encoding_map['Rating']),1)

df.drop(['Actor 1', 'Actor 2', 'Actor 3', 'Director', 'Genre'], axis=1, inplace=True)
df
```