HW 8

วาด Stacked หรือ Grouped Bar Chart ของข้อมูลหนัง india

MEMBER

นางสาวกัญญ์วรา ถาวโรฤทธิ์ รหัสนักศึกษา 653020200-1

นายอรัญชัย แสนเทพ รหัสนักศึกษา 653020219-0

นางสาวธนภรณ์ ดาษถนิม รหัสนักศึกษา 653020570-8

นางสาวสุวรรณเกตุ สุมาลี รหัสนักศึกษา 653020578-2

IMPORT DATA

นำเข้าข้อมูล

```
[1] import pandas as pd
    import os
```

```
[2] from google.colab import drive
    drive.mount('/content/drive', force_remount=True)
```

```
Mounted at /content/drive
```

```
[3] path = '/content/drive/MyDrive/data_viz_2024_DATA'
```

```
[4] movie_df = pd.read_csv(os.path.join(path,'IMDb_Movies_India.csv'), encoding='latin-1')
    movie_df
```

	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
...	...	...	...	...	...	...	...	...	...	...
15504	Zulm Ko Jala Doonga	(1988)	NaN	Action	4.6	11	Mahendra Shah	Naseeruddin Shah	Sumeet Saigal	Suparna Anand
15505	Zulmi	(1999)	129 min	Action, Drama	4.5	655	Kuku Kohli	Akshay Kumar	Twinkle Khanna	Aruna Irani
15506	Zulmi Raj	(2005)	NaN	Action	NaN	NaN	Kiran Thej	Sangeeta Tiwari	NaN	NaN
15507	Zulmi Shikari	(1988)	NaN	Action	NaN	NaN	NaN	NaN	NaN	NaN
15508	Zulm-O-Sitam	(1998)	130 min	Action, Drama	6.2	20	K.C. Bokadia	Dharmendra	Jaya Prada	Arjun Sarja

15509 rows × 10 columns

DATA CLEANSING

จัดการข้อมูล

```
[24] movie_df.duplicated().sum()
```

```
0
```

```
movie_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

```
[6] movie_df = movie_df.dropna(subset=['Genre', 'Rating', 'Year'])
    movie_df
```

	Name	Year	Duration	Genre	Rating	Votes	Director	Actor 1	Actor 2	Actor 3
1	#Gadhvi (He thought he was Gandhi)	(2019)	109 min	Drama	7.0	8	Gaurav Bakshi	Rasika Dugal	Vivek Ghamande	Arvind Jangid
3	#Yaaram	(2019)	110 min	Comedy, Romance	4.4	35	Ovais Khan	Prateik	Ishita Raj	Siddhant Kapoor
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
8	?: A Question Mark	(2012)	82 min	Horror, Mystery, Thriller	5.6	326	Allyson Patel	Yash Dave	Muntazir Ahmad	Kiran Bhatia
...	...	...	...	...	...	...	...	...	...	...
15501	Zulm Ki Hukumat	(1992)	NaN	Action, Crime, Drama	5.3	135	Bharat Rangachary	Dharmendra	Moushumi Chatterjee	Govinda
15503	Zulm Ki Zanjeer	(1989)	125 min	Action, Crime, Drama	5.8	44	S.P. Muthuraman	Chiranjeevi	Jayamalini	Rajinikanth
15504	Zulm Ko Jala Doonga	(1988)	NaN	Action	4.6	11	Mahendra Shah	Naseeruddin Shah	Sumeet Saigal	Suparna Anand
15505	Zulmi	(1999)	129 min	Action, Drama	4.5	655	Kuku Kohli	Akshay Kumar	Twinkle Khanna	Aruna Irani
15508	Zulm-O-Sitam	(1998)	130 min	Action, Drama	6.2	20	K.C. Bokadia	Dharmendra	Jaya Prada	Arjun Sarja

7817 rows × 10 columns

```
[7] #หลัง dropna แล้วข้อมูลเหลือกี่ % จากเดิม

    print(f"ข้อมูลเหลือ {(len(movie_df) / len(pd.read_csv(os.path.join(path,'IMDb_Movies_India.csv'), encoding='latin-1'))) * 100:.2f}% จากเดิม")
```

```
ข้อมูลเหลือ 50.40% จากเดิม
```

```
[8] movie_df['Year'] = movie_df['Year'].astype(str).str.replace('(', '').str.replace(')', '').astype(int)
    movie_df
```

```
<ipython-input-8-c79b7c519f7a>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  movie_df['Year'] = movie_df['Year'].astype(str).str.replace('(', '').str.replace(')', '').astype(int)
```

	Name	Year	Duration	Genre	Rating	Votes	Director	Actor 1	Actor 2	Actor 3
1	#Gadhvi (He thought he was Gandhi)	2019	109 min	Drama	7.0	8	Gaurav Bakshi	Rasika Dugal	Vivek Ghamande	Arvind Jangid
3	#Yaaram	2019	110 min	Comedy, Romance	4.4	35	Ovais Khan	Prateik	Ishita Raj	Siddhant Kapoor
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
8	?: A Question Mark	2012	82 min	Horror, Mystery, Thriller	5.6	326	Allyson Patel	Yash Dave	Muntazir Ahmad	Kiran Bhatia
...	...	...	...	...	...	...	...	...	...	...
15501	Zulm Ki Hukumat	1992	NaN	Action, Crime, Drama	5.3	135	Bharat Rangachary	Dharmendra	Moushumi Chatterjee	Govinda
15503	Zulm Ki Zanjeer	1989	125 min	Action, Crime, Drama	5.8	44	S.P. Muthuraman	Chiranjeevi	Jayamalini	Rajinikanth
15504	Zulm Ko Jala Doonga	1988	NaN	Action	4.6	11	Mahendra Shah	Naseeruddin Shah	Sumeet Saigal	Suparna Anand
15505	Zulmi	1999	129 min	Action, Drama	4.5	655	Kuku Kohli	Akshay Kumar	Twinkle Khanna	Aruna Irani
15508	Zulm-O-Sitam	1998	130 min	Action, Drama	6.2	20	K.C. Bokadia	Dharmendra	Jaya Prada	Arjun Sarja

7817 rows × 10 columns

Plot group bar chart ของ หนังอินเดีย โดยแยกกลุ่มตาม Genre และเปรียบเทียบ Rating จาก Year

```
[9] movie_df = movie_df[['Year', 'Genre', 'Rating']]
    movie_df
```

	Year	Genre	Rating
1	2019	Drama	7.0
3	2019	Comedy, Romance	4.4
5	1997	Comedy, Drama, Musical	4.7
6	2005	Drama, Romance, War	7.4
8	2012	Horror, Mystery, Thriller	5.6
...	...	...	...
15501	1992	Action, Crime, Drama	5.3
15503	1989	Action, Crime, Drama	5.8
15504	1988	Action	4.6
15505	1999	Action, Drama	4.5
15508	1998	Action, Drama	6.2

7817 rows × 3 columns

```python
# แยก Genre ออกมาเป็น list
all_genres = []
for index, row in movie_df.iterrows():
    genres = row['Genre'].split(',')
    for genre in genres:
        genre = genre.strip()
        if genre not in all_genres:
            all_genres.append(genre)

# แสดงผล Genre ทั้งหมด
all_genres
```

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

```python
[11] print(f"มี all_genres ทั้งหมด {len(all_genres)} ประเภท")
```

```
มี all_genres ทั้งหมด 22 ประเภท
```

```python
# สร้าง dictionary เพื่อเก็บจำนวนภาพยนตร์ในแต่ละประเภท
genre_counts = {}
for genre in all_genres:
    genre_counts[genre] = 0

# นับจำนวนภาพยนตร์ในแต่ละประเภท
for index, row in movie_df.iterrows():
    genres = row['Genre'].split(',')
    for genre in genres:
        genre = genre.strip()
        genre_counts[genre] += 1

# เรียงลำดับประเภทหนังตามจำนวนภาพยนตร์จากมากไปน้อย
sorted_genres = sorted(genre_counts.items(), key=lambda x: x[1], reverse=True)

# แสดงผล
for genre, count in sorted_genres:
    print(f"{genre}: {count}")
```

```
Drama: 4924
Action: 2358
Romance: 1781
Comedy: 1609
Crime: 1111
Thriller: 876
Family: 663
Musical: 498
Adventure: 386
Mystery: 370
Horror: 280
Fantasy: 205
Documentary: 143
Biography: 142
History: 128
Animation: 73
Music: 61
Sport: 51
Sci-Fi: 37
War: 34
Western: 3
News: 2
```

```
[13] # Create separate DataFrames for each genre
     drama_df = movie_df[movie_df['Genre'] == 'Drama']
     action_df = movie_df[movie_df['Genre'] == 'Action']
     romance_df = movie_df[movie_df['Genre'] == 'Romance']
     comedy_df = movie_df[movie_df['Genre'] == 'Comedy']
     crime_df = movie_df[movie_df['Genre'] == 'Crime']
```

```
[14] all_table = pd.concat([drama_df,action_df,romance_df,comedy_df, crime_df])
     all_table
```

	Year	Genre	Rating
1	2019	Drama	7.0
10	2004	Drama	6.2
30	2005	Drama	7.1
32	1993	Drama	5.6
36	2004	Drama	4.5
...	...	...	...
13588	2014	Crime	5.9
14142	2014	Crime	5.3
14357	2019	Crime	5.4
14898	2021	Crime	8.9
15238	2001	Crime	3.3

2128 rows × 3 columns

```
[16] # เรียงลำดับปี
     years = sorted(all_table['Year'].unique())

     # แบ่งปีออกเป็นแถวละ 30, 31, 31
     rows = []
     current_row = []
     for year in years:
       current_row.append(year)
       if len(current_row) == 30 or len(current_row) == 31:
         rows.append(current_row)
         current_row = []

     if current_row:
       rows.append(current_row)

     # แสดงผล
     for row in rows:
       print(row)
```

```
[1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961]
[1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991]
[1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021]
```

```python
# prompt: แบ่งออกเป็น 3 ช่วง: 1917-1959,  1960-1990, 1991-2021

# Function to categorize years
def categorize_year(year):
  if 1917 <= year <= 1959:
    return '1917-1959'
  elif 1960 <= year <= 1990:
    return '1960-1990'
  elif 1991 <= year <= 2021:
    return '1991-2021'
  else:
    return 'Other'

# Apply the function to create a new column
all_table['Year_Category'] = all_table['Year'].apply(categorize_year)

# Display the DataFrame with the new column
all_table
```

	Year	Genre	Rating	Year_Category
1	2019	Drama	7.0	1991-2021
10	2004	Drama	6.2	1991-2021
30	2005	Drama	7.1	1991-2021
32	1993	Drama	5.6	1991-2021
36	2004	Drama	4.5	1991-2021
...	...	...	...	...
13588	2014	Crime	5.9	1991-2021
14142	2014	Crime	5.3	1991-2021
14357	2019	Crime	5.4	1991-2021
14898	2021	Crime	8.9	1991-2021
15238	2001	Crime	3.3	1991-2021

2128 rows × 4 columns

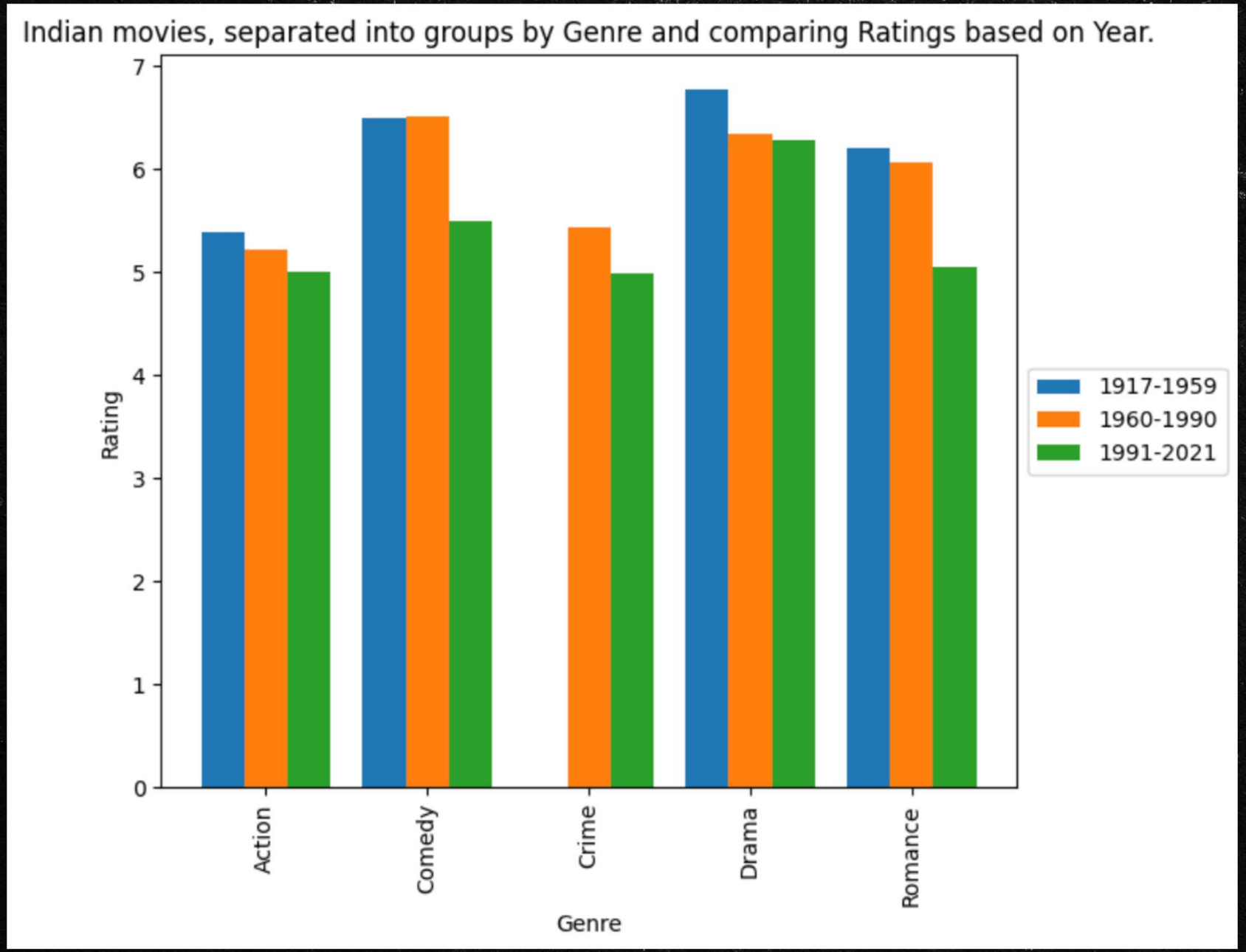
```python
[18] all_table.groupby(['Genre','Year_Category'])['Rating'].mean()
```

		Rating
Genre	Year_Category	
Action	1917-1959	5.388889
	1960-1990	5.218954
	1991-2021	5.006275
Comedy	1917-1959	6.490000
	1960-1990	6.506667
	1991-2021	5.487255
Crime	1960-1990	5.433333
	1991-2021	4.979310
Drama	1917-1959	6.767188
	1960-1990	6.337562
	1991-2021	6.278980
Romance	1917-1959	6.196154
	1960-1990	6.056790
	1991-2021	5.047244

dtype: float64

```
[19] india_bar_data = all_table.groupby(['Genre','Year_Category'])['Rating'].mean().unstack()
```

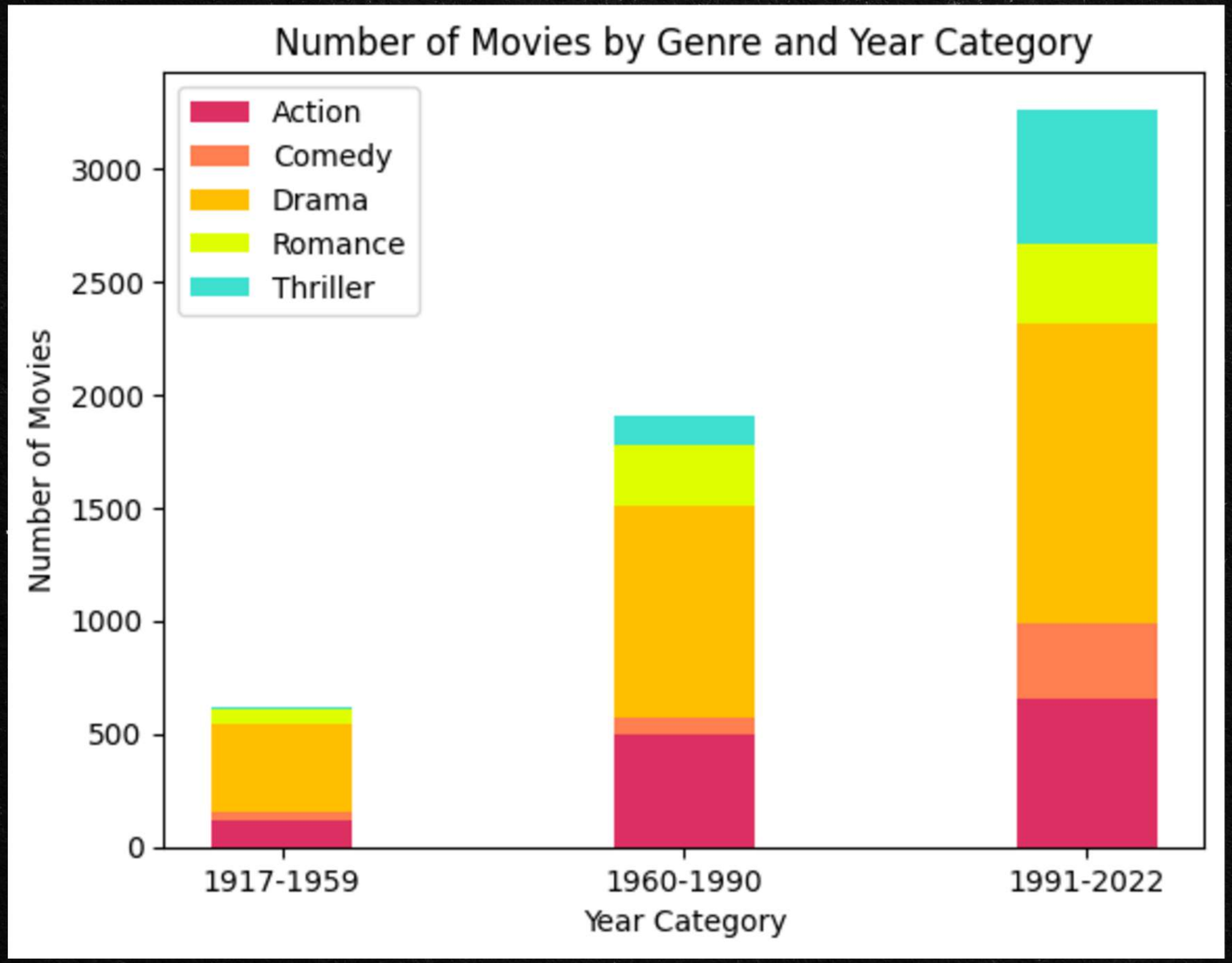
```
import matplotlib.pyplot as plt

ax = india_bar_data.plot(kind='bar', figsize=(8, 6), width=0.8)

# Add labels and title
plt.xlabel('Genre')
plt.ylabel('Rating')
plt.title('Indian movies, separated into groups by Genre and comparing Ratings based on Year.')

# Move the legend outside the plot
plt.legend(loc='center left', bbox_to_anchor=(1, 0.5))

# Adjust the plot size
plt.gcf().subplots_adjust(right=0.8)

# Show the plot
plt.show()
```


Indian movies, separated into groups by Genre and comparing Ratings based on Year.
Rating
0
1
2
3
4
5
6
7
Action
Comedy
Crime
Drama
Romance
Genre
1917-1959
1960-1990
1991-2021

HW 8

plot stacked bar chart

นับจำนวนหนังแต่ละประเภทตามช่วงปี


Number of Movies by Genre and Year Category
Action
Comedy
Drama
Romance
Thriller
Number of Movies
0
500
1000
1500
2000
2500
3000
1917-1959
1960-1990
1991-2022
Year Category

```
[ ]  data_india = data_india.dropna(subset=['Year','Genre'])
     data_india
```

	Name	Year	Duration	Genre	Rating	Votes	Director	Actor 1	Actor 2	Actor 3
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
...	...	...	...	...	...	...	...	...	...	...
15504	Zulm Ko Jala Doonga	(1988)	NaN	Action	4.6	11	Mahendra Shah	Naseeruddin Shah	Sumeet Saigal	Suparna Anand
15505	Zulmi	(1999)	129 min	Action, Drama	4.5	655	Kuku Kohli	Akshay Kumar	Twinkle Khanna	Aruna Irani
15506	Zulmi Raj	(2005)	NaN	Action	NaN	NaN	Kiran Thej	Sangeeta Tiwari	NaN	NaN
15507	Zulmi Shikari	(1988)	NaN	Action	NaN	NaN	NaN	NaN	NaN	NaN
15508	Zulm-O-Sitam	(1998)	130 min	Action, Drama	6.2	20	K.C. Bokadia	Dharmendra	Jaya Prada	Arjun Sarja

13140 rows × 10 columns

```
[ ]  #หลัง dropna แล้วข้อมูลเหลือกี่ % จากเดิม

     print(f"ข้อมูลเหลือ {(len(data_india) / len(pd.read_csv(os.path.join(path,'IMDb Movies India.csv'), encoding='latin-1'))) * 100:.2f}% จากเดิม")
```

```
ข้อมูลเหลือ 84.72% จากเดิม
```

```
[ ] data_india['Year'] = data_india['Year'].str.replace('(', '').str.replace(')', '').astype(int)
    data_india
```

	Name	Year	Duration	Genre	Rating	Votes	Director	Actor 1	Actor 2	Actor 3
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
...	...	...	...	...	...	...	...	...	...	...
15504	Zulm Ko Jala Doonga	1988	NaN	Action	4.6	11	Mahendra Shah	Naseeruddin Shah	Sumeet Saigal	Suparna Anand
15505	Zulmi	1999	129 min	Action, Drama	4.5	655	Kuku Kohli	Akshay Kumar	Twinkle Khanna	Aruna Irani
15506	Zulmi Raj	2005	NaN	Action	NaN	NaN	Kiran Thej	Sangeeta Tiwari	NaN	NaN
15507	Zulmi Shikari	1988	NaN	Action	NaN	NaN	NaN	NaN	NaN	NaN
15508	Zulm-O-Sitam	1998	130 min	Action, Drama	6.2	20	K.C. Bokadia	Dharmendra	Jaya Prada	Arjun Sarja

13140 rows × 10 columns

```
data_india = data_india[['Year','Genre','Name']] # Use square brackets to select columns
data_india
```

	Year	Genre	Name
1	2019	Drama	#Gadhvi (He thought he was Gandhi)
2	2021	Drama, Musical	#Homecoming
3	2019	Comedy, Romance	#Yaaram
4	2010	Drama	...And Once Again
5	1997	Comedy, Drama, Musical	...Aur Pyaar Ho Gaya
...	...	...	...
15504	1988	Action	Zulm Ko Jala Doonga
15505	1999	Action, Drama	Zulmi
15506	2005	Action	Zulmi Raj
15507	1988	Action	Zulmi Shikari
15508	1998	Action, Drama	Zulm-O-Sitam

13140 rows × 3 columns

```python
# สร้าง dictionary เพื่อเก็บจำนวนภาพยนตร์ในแต่ละประเภท
genre_counts = {}
for genre in all_genres:
    genre_counts[genre] = 0

# นับจำนวนภาพยนตร์ในแต่ละประเภท
for index, row in data_india.iterrows():
    if isinstance(row['Genre'], str): # Check if the genre value is a string
        genres = row['Genre'].split(',')
        for genre in genres:
            genre = genre.strip()
            if genre in genre_counts: # Check if the genre exists in the dictionary
                genre_counts[genre] += 1

# เรียงลำดับประเภทหนังตามจำนวนภาพยนตร์จากมากไปน้อย
sorted_genres = sorted(genre_counts.items(), key=lambda x: x[1], reverse=True)

# แสดงผล
for genre, count in sorted_genres:
    print(f"{genre}: {count}")
```

```
Drama: 7034
Action: 3479
Romance: 2401
Comedy: 1950
Thriller: 1621
Crime: 1287
Family: 928
Musical: 578
Adventure: 518
Mystery: 492
Horror: 488
Fantasy: 444
Documentary: 370
History: 197
Biography: 194
Animation: 119
Music: 85
Sport: 66
Sci-Fi: 53
War: 42
News: 9
Western: 4
Reality-TV: 3
Short: 1
```

```
[ ] # Create separate DataFrames for each genre
    drama_df = data_india[data_india['Genre'] == 'Drama']
    action_df = data_india[data_india['Genre'] == 'Action']
    romance_df = data_india[data_india['Genre'] == 'Romance']
    comedy_df = data_india[data_india['Genre'] == 'Comedy']
    thriller_df = data_india[data_india['Genre'] == 'Thriller']
```

```
all_table = pd.concat([drama_df,action_df,romance_df,comedy_df, thriller_df])
all_table
```

	Year	Genre	Name
1	2019	Drama	#Gadhvi (He thought he was Gandhi)
4	2010	Drama	...And Once Again
10	2004	Drama	1:1.6 An Ode to Lost Love
27	2020	Drama	13 Tribute of Love
30	2005	Drama	15 Park Avenue
...	...	...	...
15278	2002	Thriller	Yeh Raat Honeymoon Ki
15295	2005	Thriller	Yehi Hai High Society
15307	2017	Thriller	You Make Me Feel Alive
15349	1991	Thriller	Zakhmi Haseena
15350	1990	Thriller	Zakhmi Kali

```
[ ] all_table['Year'].unique()
```

```
array([2019, 2010, 2004, 2020, 2005, 1993, 2014, 2018, 1956, 2008, 1974,
       2016, 2007, 2017, 1959, 2013, 1970, 2021, 2011, 1983, 1982, 1996,
       1957, 2009, 1947, 1992, 1977, 1987, 1976, 1991, 1979, 1940, 1968,
       2000, 1985, 1966, 1988, 2001, 1984, 1972, 2003, 1948, 1952, 1990,
       1978, 1953, 1986, 1965, 1997, 1999, 1980, 1989, 1933, 1939, 1971,
       1995, 2015, 1955, 1973, 1960, 1975, 1981, 1936, 1967, 1961, 1949,
       1941, 1937, 2002, 1954, 1964, 1994, 2012, 1951, 1950, 1963, 1945,
       1938, 1962, 1969, 2006, 1943, 1932, 1935, 1946, 1958, 1998, 1942,
       1944, 1931, 1934, 2022])
```

```
# prompt: มีทั้งหมดกี่ปี

# Find the number of unique years
num_years = len(all_table['Year'].unique())
print(f"มีทั้งหมด {num_years} ปี")
```

```
มีทั้งหมด 92 ปี
```

```python
# prompt: แบ่งปีออกเป็น 3 ช่วง

# Function to categorize years
def categorize_year(year):
  if 1917 <= year <= 1959:
    return '1917-1959'
  elif 1960 <= year <= 1990:
    return '1960-1990'
  elif 1991 <= year <= 2022:
    return '1991-2022'
  else:
    return 'Other'

# Apply the function to create a new column
all_table['Year_Category'] = all_table['Year'].apply(categorize_year)

# Display the DataFrame with the new column
all_table
```

	Year	Genre	Name	Year_Category
1	2019	Drama	#Gadhvi (He thought he was Gandhi)	1991-2022
4	2010	Drama	...And Once Again	1991-2022
10	2004	Drama	1:1.6 An Ode to Lost Love	1991-2022
27	2020	Drama	13 Tribute of Love	1991-2022
30	2005	Drama	15 Park Avenue	1991-2022
...	...	...	...	...
15278	2002	Thriller	Yeh Raat Honeymoon Ki	1991-2022
15295	2005	Thriller	Yehi Hai High Society	1991-2022
15307	2017	Thriller	You Make Me Feel Alive	1991-2022
15349	1991	Thriller	Zakhmi Haseena	1991-2022
15350	1990	Thriller	Zakhmi Kali	1960-1990

5787 rows × 4 columns

```
movie_counts = all_table.groupby(['Year_Category', 'Genre'])['Name'].count().unstack()
```

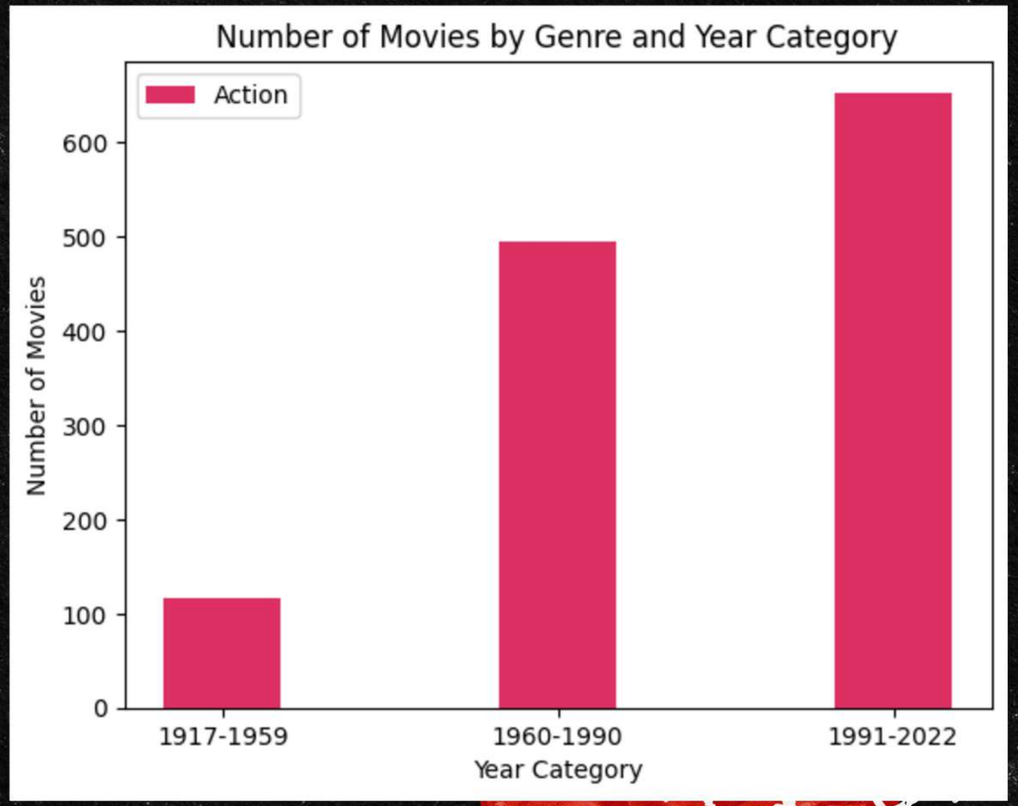
```
[ ] movie_counts['Action'].values
```

```
array([117, 495, 653])
```

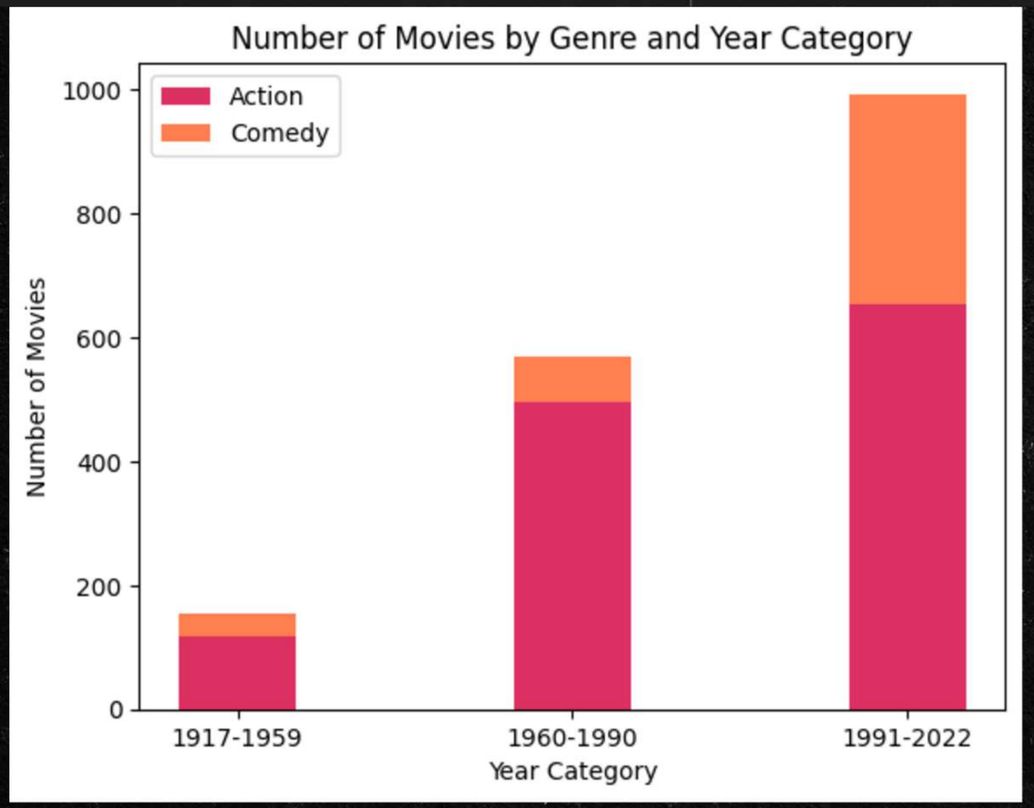
```
[ ] movie_counts.index
```

```
Index(['1917-1959', '1960-1990', '1991-2022'], dtype='object', name='Year_Category')
```

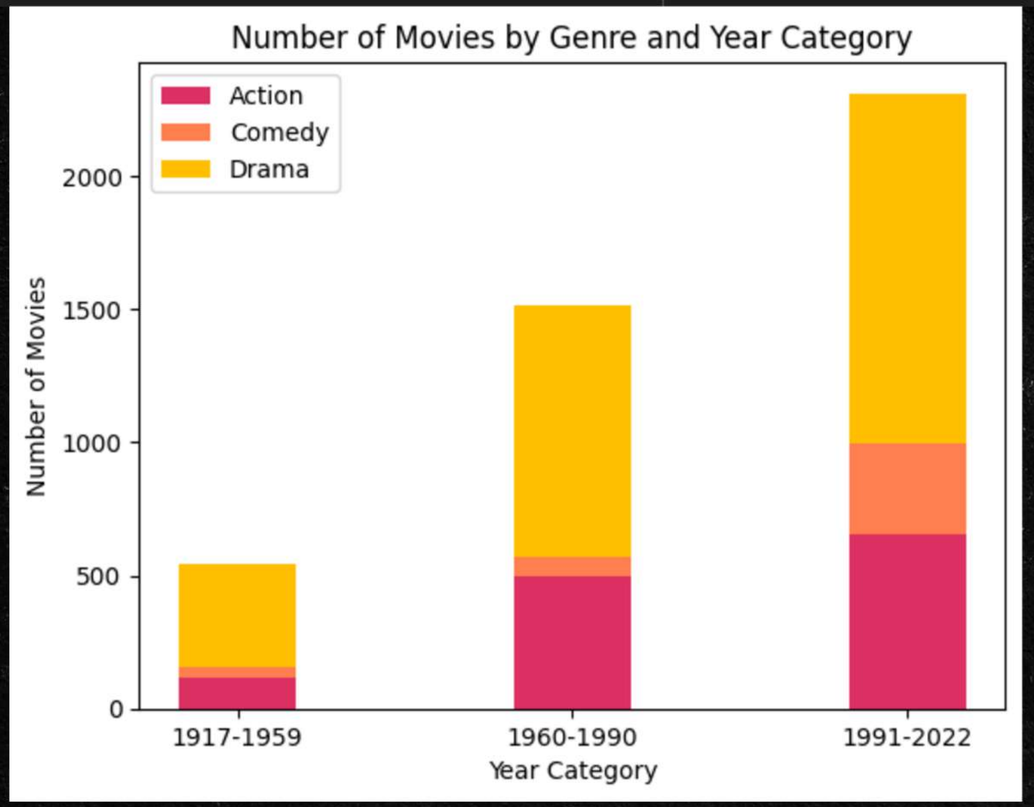
```python
import matplotlib.pyplot as plt #stack คือเอามาซ้อนกัน

width = 0.35       # the width of the bars: can also be len(x) sequence

fig, ax = plt.subplots()

ax.bar(movie_counts.index,movie_counts['Action'].values, width, label='Action',color = '#DE3163')
#ax.bar(labels, b4midnight, width, bottom=b4lunch, label='before midnight',color = '#19038a')

plt.xlabel('Year Category')
plt.ylabel('Number of Movies')
plt.title('Number of Movies by Genre and Year Category')
ax.legend()

plt.show()
```



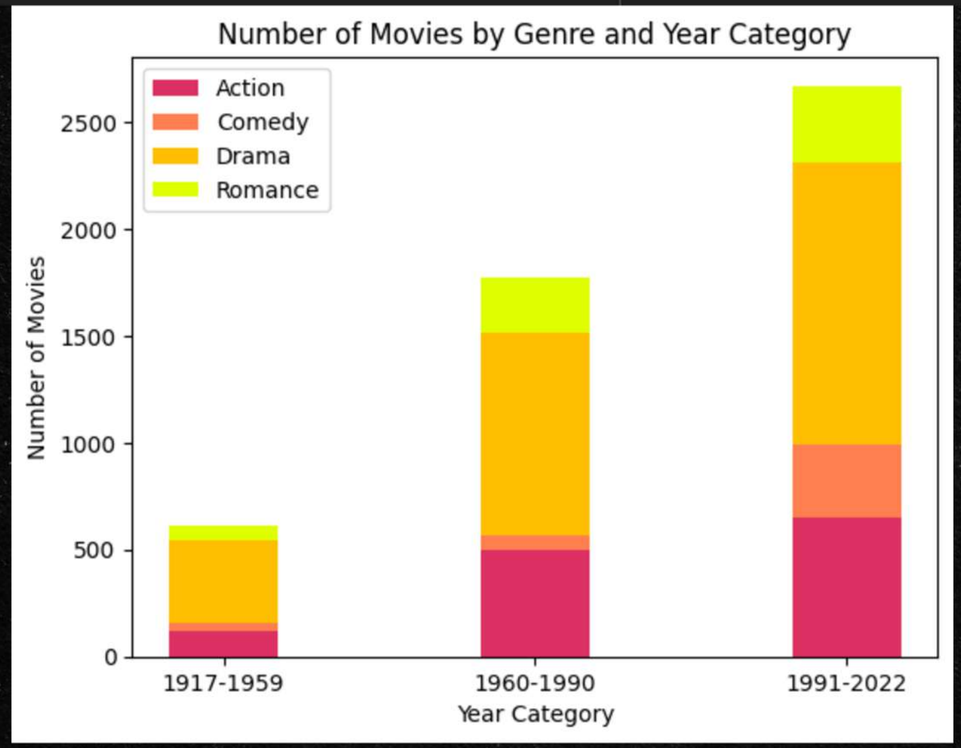
```python
import matplotlib.pyplot as plt #stack คือเอามาซ้อนกัน

width = 0.35       # the width of the bars: can also be len(x) sequence

fig, ax = plt.subplots()

ax.bar(movie_counts.index,movie_counts['Action'].values, width, label='Action',color = '#DE3163')
ax.bar(movie_counts.index,movie_counts['Comedy'].values, width, bottom=movie_counts['Action'].values, label='Comedy',color = '#FF7F50')
#ax.bar(labels, b4midnight, width, bottom=b4lunch, label='before midnight',color = '#19038a')

plt.xlabel('Year Category')
plt.ylabel('Number of Movies')
plt.title('Number of Movies by Genre and Year Category')
ax.legend()

plt.show()
```



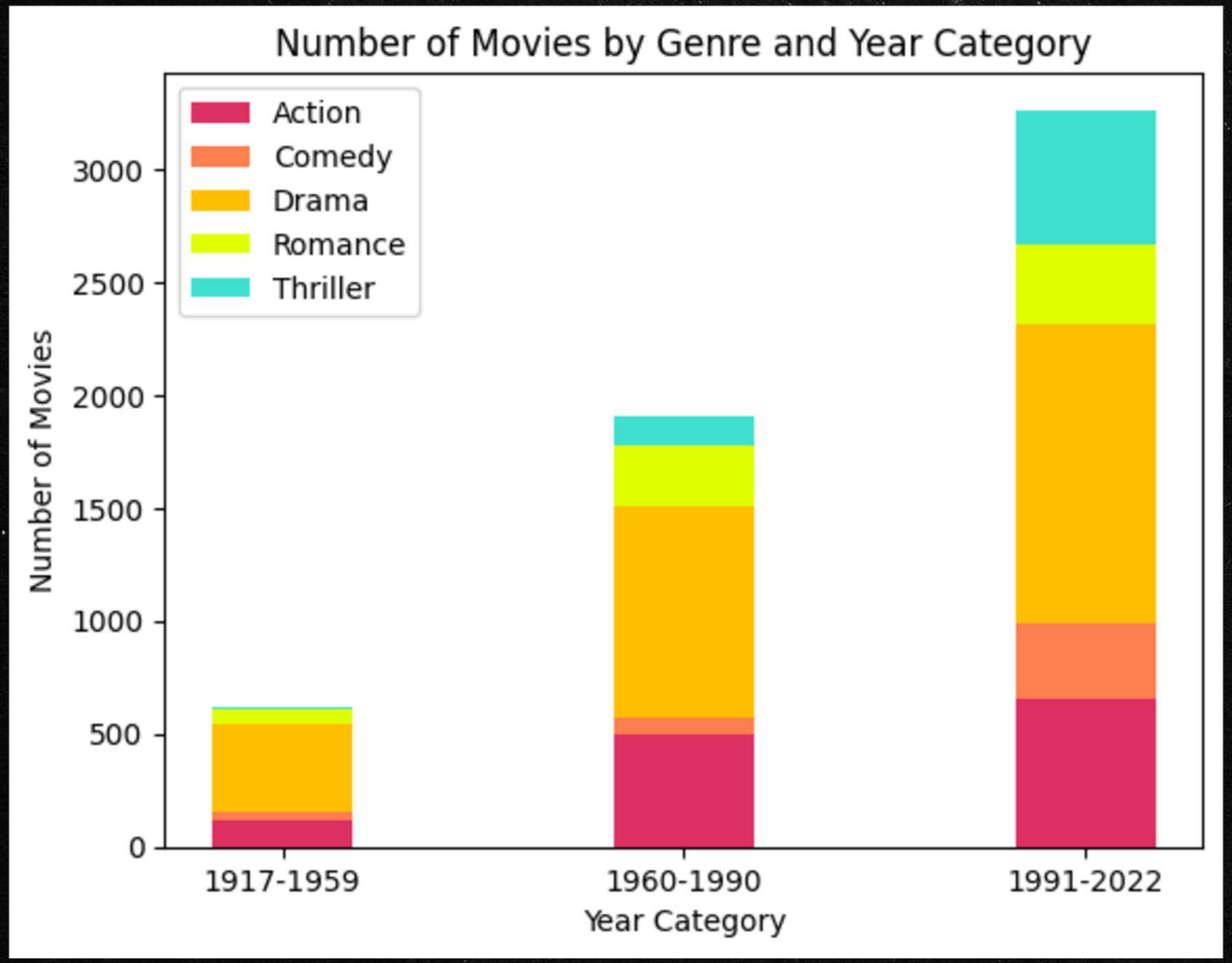
```python
import matplotlib.pyplot as plt #stack คือเอามาซ้อนกัน

width = 0.35       # the width of the bars: can also be len(x) sequence

fig, ax = plt.subplots()

ax.bar(movie_counts.index,movie_counts['Action'].values, width, label='Action',color = '#DE3163')
ax.bar(movie_counts.index,movie_counts['Comedy'].values, width, bottom=movie_counts['Action'].values, label='Comedy',color = '#FF7F50')
ax.bar(movie_counts.index,movie_counts['Drama'].values, width,
         bottom=movie_counts['Action']+movie_counts['Comedy'].values, label='Drama',color = '#FFBF00')
#ax.bar(labels, b4midnight, width, bottom=b4lunch, label='before midnight',color = '#19038a')

plt.xlabel('Year Category')
plt.ylabel('Number of Movies')
plt.title('Number of Movies by Genre and Year Category')
ax.legend()

plt.show()
```



```python
import matplotlib.pyplot as plt #stack คือเอามาซ้อนกัน

width = 0.35       # the width of the bars: can also be len(x) sequence

fig, ax = plt.subplots()

ax.bar(movie_counts.index,movie_counts['Action'].values, width, label='Action',color = '#DE3163')
ax.bar(movie_counts.index,movie_counts['Comedy'].values, width, bottom=movie_counts['Action'].values, label='Comedy',color = '#FF7F50')
ax.bar(movie_counts.index,movie_counts['Drama'].values, width,
       bottom=movie_counts['Action']+movie_counts['Comedy'].values, label='Drama',color = '#FFBF00')
ax.bar(movie_counts.index,movie_counts['Romance'].values, width,
       bottom=movie_counts['Action']+movie_counts['Comedy']+movie_counts['Drama'].values, label='Romance',color = '#DFFF00')
#ax.bar(labels, b4midnight, width, bottom=b4lunch, label='before midnight',color = '#19038a')

plt.xlabel('Year Category')
plt.ylabel('Number of Movies')
plt.title('Number of Movies by Genre and Year Category')
ax.legend()

plt.show()
```



```python
import matplotlib.pyplot as plt #stack คือเอามาซ้อนกัน

width = 0.35       # the width of the bars: can also be len(x) sequence

fig, ax = plt.subplots()

ax.bar(movie_counts.index,movie_counts['Action'].values, width, label='Action',color = '#DE3163')
ax.bar(movie_counts.index,movie_counts['Comedy'].values, width,
       bottom=movie_counts['Action'].values, label='Comedy',color = '#FF7F50')
ax.bar(movie_counts.index,movie_counts['Drama'].values, width,
       bottom=movie_counts['Action']+movie_counts['Comedy'].values, label='Drama',color = '#FFBF00')
ax.bar(movie_counts.index,movie_counts['Romance'].values, width,
       bottom=movie_counts['Action']+movie_counts['Comedy']+movie_counts['Drama'].values, label='Romance',color = '#DFFF00')
ax.bar(movie_counts.index,movie_counts['Thriller'].values, width,
       bottom=movie_counts['Action']+movie_counts['Comedy']+movie_counts['Drama']+movie_counts['Romance'].values, label='Thriller',color = '#40E0D0')
#ax.bar(labels, b4midnight, width, bottom=b4lunch, label='before midnight',color = '#19038a')

plt.xlabel('Year Category')
plt.ylabel('Number of Movies')
plt.title('Number of Movies by Genre and Year Category')
ax.legend()

plt.show()
```


Number of Movies by Genre and Year Category
Action
Comedy
Drama
Romance
Thriller
Number of Movies
0
500
1000
1500
2000
2500
3000
1917-1959
1960-1990
1991-2022
Year Category

THANK YOU!