Final Project Submission

Please fill out:

- Student name:
- Student pace: self paced / part time / full time
- Scheduled project review date/time:
- Instructor name:
- Blog post URL:

Project Description: Provide a brief overview of the project, its purpose, and what it aims to achieve.

*Installation:

*Business Questions:

*Preparing the The Data

*Key Points to note

*Which genres of movies are the most profitable?

*What types of movies are being created the most

*Further Investigation

*Conclusion

I Analysed this project based on

Genre Trend/Popularity Financial/profits/costs Target Market/Audience/demographics-gender/enthnicty/age/Income class I used the financial data(gross and profit) as the determining factors to measure success

This analysis focuses on identifying lucrative market niches, understanding audience preferences, and providing actionable insights to guide Microsoft in the selection and production of profitable film genres for their new venture.

The analysis used the data on movie gross and movie reviews

In [2]:
```python
# Your code here - remember to use markdown cells for comments as well!
#Import Libraries
#Read data
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import csv
```

In [9]:
```python
#loading data into a dataframe and first look at the data
Gross_Movies = pd.read_csv("C:/Users/HP/Documents/Flatiron/Project/phase1/dsc-phase-
Gross_Movies
```

Out[9]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross
0	1	Dec 18, 2009	Avatar	$425,000,000	$760,507,625	$2,776,345,279
1	2	May 20, 2011	Pirates of the Caribbean: On Stranger Tides	$410,600,000	$241,063,875	$1,045,663,875
2	3	Jun 7, 2019	Dark Phoenix	$350,000,000	$42,762,350	$149,762,350
3	4	May 1, 2015	Avengers: Age of Ultron	$330,600,000	$459,005,868	$1,403,013,963
4	5	Dec 15, 2017	Star Wars Ep. VIII: The Last Jedi	$317,000,000	$620,181,382	$1,316,721,747
...	...	...	...	...	...	...
5777	78	Dec 31, 2018	Red 11	$7,000	$0	$0
5778	79	Apr 2, 1999	Following	$6,000	$48,482	$240,495
5779	80	Jul 13, 2005	Return to the Land of Wonders	$5,000	$1,338	$1,338
5780	81	Sep 29, 2015	A Plague So Pleasant	$1,400	$0	$0
5781	82	Aug 5, 2005	My Date With Drew	$1,100	$181,041	$181,041

5782 rows × 6 columns

In [48]:

```
#summary information about the DataFrame
Gross_Movies.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5782 entries, 0 to 5781
Data columns (total 6 columns):
 #   Column             Non-Null Count  Dtype 
---  ------             --------------  ----- 
 0   id                 5782 non-null   int64 
 1   release_date       5782 non-null   object
 2   movie              5782 non-null   object
 3   production_budget  5782 non-null   object
 4   domestic_gross     5782 non-null   object
 5   worldwide_gross    5782 non-null   object
dtypes: int64(1), object(5)
memory usage: 271.2+ KB
```

In [49]:

```
#Getting more information about the data- Checking to see if there are duplicates
duplicates = Gross_Movies.duplicated()
duplicates
```

Out[49]:

```
0       False
1       False
2       False
3       False
4       False
        ...  
5777    False
5778    False
5779    False
5780    False
5781    False
Length: 5782, dtype: bool
```

In [10]:

```
#Converting the columns to strings to be able to be to carry further analysis
Gross_Movies['production_budget'] = Gross_Movies['production_budget'].astype(str)
```

```
Gross_Movies['domestic_gross'] = Gross_Movies['domestic_gross'].astype(str)
Gross_Movies['worldwide_gross'] = Gross_Movies['worldwide_gross'].astype(str)
print(Gross_Movies.dtypes)
```

```
id                    int64
release_date         object
movie                object
production_budget    object
domestic_gross       object
worldwide_gross      object
dtype: object
```

In [11]:

```
#removing special characters
Gross_Movies['production_budget'] = Gross_Movies['production_budget'].str.replace('$
Gross_Movies['domestic_gross'] = Gross_Movies['domestic_gross'].str.replace('$', '')
Gross_Movies['worldwide_gross'] = Gross_Movies['worldwide_gross'].str.replace('$', '
Gross_Movies
```

```
C:\Users\HP\AppData\Local\Temp\ipykernel_4820\3011107977.py:2: FutureWarning: The def
ault value of regex will change from True to False in a future version. In addition,
single character regular expressions will *not* be treated as literal strings when re
gex=True.
  Gross_Movies['production_budget'] = Gross_Movies['production_budget'].str.replace
('$', '').str.replace(',', '')
C:\Users\HP\AppData\Local\Temp\ipykernel_4820\3011107977.py:3: FutureWarning: The def
ault value of regex will change from True to False in a future version. In addition,
single character regular expressions will *not* be treated as literal strings when re
gex=True.
  Gross_Movies['domestic_gross'] = Gross_Movies['domestic_gross'].str.replace('$',
'').str.replace(',', '')
C:\Users\HP\AppData\Local\Temp\ipykernel_4820\3011107977.py:4: FutureWarning: The def
ault value of regex will change from True to False in a future version. In addition,
single character regular expressions will *not* be treated as literal strings when re
gex=True.
  Gross_Movies['worldwide_gross'] = Gross_Movies['worldwide_gross'].str.replace('$',
'').str.replace(',', '')
```

Out[11]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross
0	1	Dec 18, 2009	Avatar	425000000	760507625	2776345279
1	2	May 20, 2011	Pirates of the Caribbean: On Stranger Tides	410600000	241063875	1045663875
2	3	Jun 7, 2019	Dark Phoenix	350000000	42762350	149762350
3	4	May 1, 2015	Avengers: Age of Ultron	330600000	459005868	1403013963
4	5	Dec 15, 2017	Star Wars Ep. VIII: The Last Jedi	317000000	620181382	1316721747
...	...	...	...	...	...	...
5777	78	Dec 31, 2018	Red 11	7000	0	0
5778	79	Apr 2, 1999	Following	6000	48482	240495
5779	80	Jul 13, 2005	Return to the Land of Wonders	5000	1338	1338
5780	81	Sep 29, 2015	A Plague So Pleasant	1400	0	0
5781	82	Aug 5, 2005	My Date With Drew	1100	181041	181041

5782 rows × 6 columns

In [12]:
```
Gross_Movies['production_budget'] = Gross_Movies['production_budget'].astype(float)
Gross_Movies['domestic_gross'] = Gross_Movies['domestic_gross'].astype(float)
Gross_Movies['worldwide_gross'] = Gross_Movies['worldwide_gross'].astype(float)
Gross_Movies
```

Out[12]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross
0	1	Dec 18, 2009	Avatar	425000000.0	760507625.0	2.776345e+09
1	2	May 20, 2011	Pirates of the Caribbean: On Stranger Tides	410600000.0	241063875.0	1.045664e+09
2	3	Jun 7, 2019	Dark Phoenix	350000000.0	42762350.0	1.497624e+08
3	4	May 1, 2015	Avengers: Age of Ultron	330600000.0	459005868.0	1.403014e+09
4	5	Dec 15, 2017	Star Wars Ep. VIII: The Last Jedi	317000000.0	620181382.0	1.316722e+09
...	...	...	...	...	...	...
5777	78	Dec 31, 2018	Red 11	7000.0	0.0	0.000000e+00
5778	79	Apr 2, 1999	Following	6000.0	48482.0	2.404950e+05
5779	80	Jul 13, 2005	Return to the Land of Wonders	5000.0	1338.0	1.338000e+03
5780	81	Sep 29, 2015	A Plague So Pleasant	1400.0	0.0	0.000000e+00
5781	82	Aug 5, 2005	My Date With Drew	1100.0	181041.0	1.810410e+05

5782 rows × 6 columns

In [13]:
```
#Getting the most profitable movies domestically and world wide by subtracting the g
#Add profit column by list method
Gross_Movies['Domestic Profit'] = Gross_Movies['domestic_gross'] - Gross_Movies['pro
Gross_Movies['Worlwide Profit'] = Gross_Movies['worldwide_gross'] - Gross_Movies['pr
Gross_Movies
```

Out[13]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domesti Profi
0	1	Dec 18, 2009	Avatar	425000000.0	760507625.0	2.776345e+09	335507625.
1	2	May 20, 2011	Pirates of the Caribbean: On Stranger Tides	410600000.0	241063875.0	1.045664e+09	-169536125.
2	3	Jun 7, 2019	Dark Phoenix	350000000.0	42762350.0	1.497624e+08	-307237650.
3	4	May 1, 2015	Avengers: Age of Ultron	330600000.0	459005868.0	1.403014e+09	128405868.
4	5	Dec 15, 2017	Star Wars Ep. VIII: The Last Jedi	317000000.0	620181382.0	1.316722e+09	303181382.

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domesti Profi
...	...	...	...	...	...	...	.
5777	78	Dec 31, 2018	Red 11	7000.0	0.0	0.000000e+00	-7000.(
5778	79	Apr 2, 1999	Following	6000.0	48482.0	2.404950e+05	42482.(
5779	80	Jul 13, 2005	Return to the Land of Wonders	5000.0	1338.0	1.338000e+03	-3662.(
5780	81	Sep 29, 2015	A Plague So Pleasant	1400.0	0.0	0.000000e+00	-1400.(
5781	82	Aug 5, 2005	My Date With Drew	1100.0	181041.0	1.810410e+05	179941.(

5782 rows × 8 columns

In [74]:
```
#Narrowing down the data to only the latest 10years to make the analysis more releva

#Convert the date column 'release_date' to a date time format
Gross_Movies['release_date'] = pd.to_datetime(Gross_Movies['release_date'])
#Getting the latest date of the data set
latest_date = Gross_Movies['release_date'].max()
#Getting the start date for the 10years period parameters
start_date = latest_date - pd.DateOffset(years=10)
#Getting the movies in the 10year period from the start date to the latest date
Gross_Movies10 = Gross_Movies[(Gross_Movies['release_date'] >= start_date) & (Gross_
Gross_Movies10
```

Out[74]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domesti Prof
1	2	2011-05-20	Pirates of the Caribbean: On Stranger Tides	410600000.0	241063875.0	1.045664e+09	-169536125.
2	3	2019-06-07	Dark Phoenix	350000000.0	42762350.0	1.497624e+08	-307237650.
3	4	2015-05-01	Avengers: Age of Ultron	330600000.0	459005868.0	1.403014e+09	128405868.
4	5	2017-12-15	Star Wars Ep. VIII: The Last Jedi	317000000.0	620181382.0	1.316722e+09	303181382.
5	6	2015-12-18	Star Wars Ep. VII: The Force Awakens	306000000.0	936662225.0	2.053311e+09	630662225.
...	...	...	...	...	...	...	

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domesti Prof
5761	62	2014-12-31	Stories of Our Lives	15000.0	0.0	0.000000e+00	-15000.
5771	72	2015-05-19	Family Motocross	10000.0	0.0	0.000000e+00	-10000.
5772	73	2012-01-13	Newlyweds	9000.0	4584.0	4.584000e+03	-4416.
5777	78	2018-12-31	Red 11	7000.0	0.0	0.000000e+00	-7000.
5780	81	2015-09-29	A Plague So Pleasant	1400.0	0.0	0.000000e+00	-1400.

1935 rows × 8 columns

```
In [75]: latest_date = Gross_Movies['release_date'].max()
         latest_date
```

```
Out[75]: Timestamp('2020-12-31 00:00:00')
```

```
In [15]: #Sorting the data in ascending order to find the most profitable movies domestically
         Gross_Movies10.sort_values(by='Domestic Profit', ascending=False)
```

Out[15]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domestic Profit
5	6	2015-12-18	Star Wars Ep. VII: The Force Awakens	306000000.0	936662225.0	2.053311e+09	630662225.0
41	42	2018-02-16	Black Panther	200000000.0	700059566.0	1.348258e+09	500059566.0
33	34	2015-06-12	Jurassic World	215000000.0	652270625.0	1.648855e+09	437270625.0
43	44	2018-06-15	Incredibles 2	200000000.0	608581744.0	1.242521e+09	408581744.0
26	27	2012-05-04	The Avengers	225000000.0	623279547.0	1.517936e+09	398279547.0
...	...	...	...	...	...	...	...
31	32	2012-05-18	Battleship	220000000.0	65233400.0	3.134777e+08	-154766600.0
1	2	2011-05-20	Pirates of the Caribbean: On Stranger Tides	410600000.0	241063875.0	1.045664e+09	-169536125.0
12	13	2013-07-02	The Lone Ranger	275000000.0	89302115.0	2.600021e+08	-185697885.0
13	14	2012-03-09	John Carter	275000000.0	73058679.0	2.827781e+08	-201941321.0
2	3	2019-06-07	Dark	350000000.0	42762350.0	1.497624e+08	-307237650.0

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domestic Profit
			Phoenix				

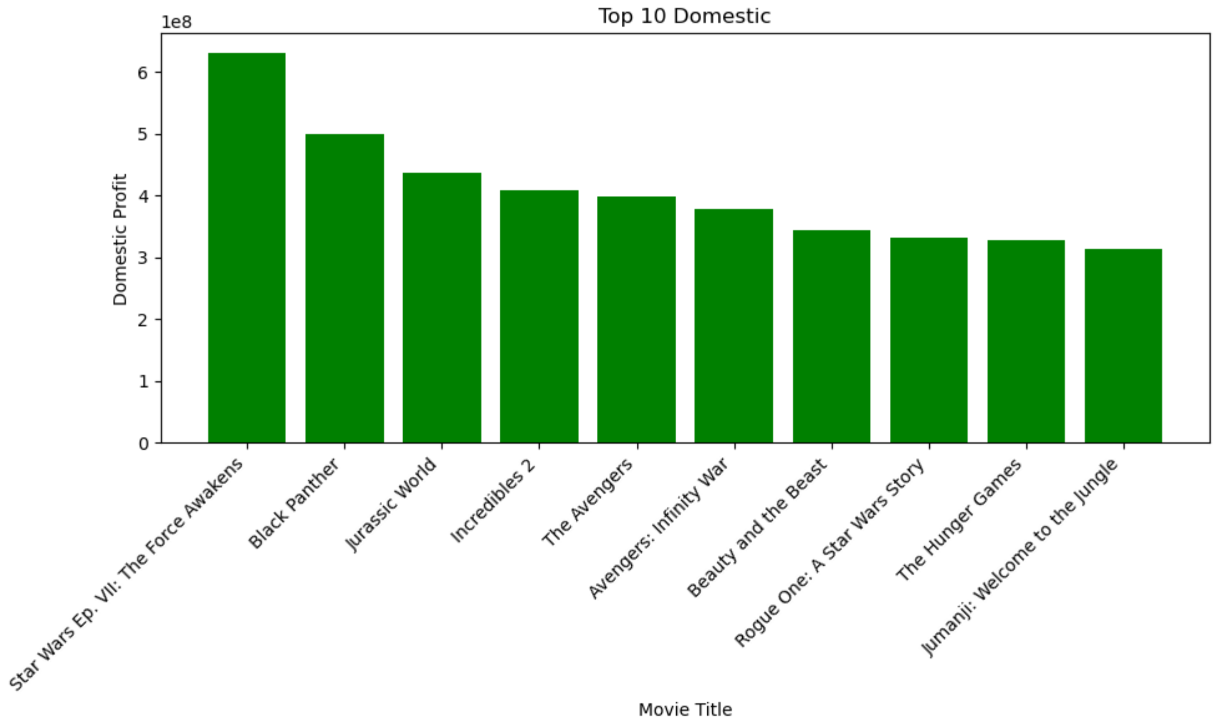
1935 rows × 8 columns

In [16]:
```
#To get the 10 most profitable movies domestically
Top_Domestic = Gross_Movies10.sort_values(by='Domestic Profit', ascending=False).hea
Top_Domestic
```

Out[16]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domestic Profit
5	6	2015-12-18	Star Wars Ep. VII: The Force Awakens	306000000.0	936662225.0	2.053311e+09	630662225.0
41	42	2018-02-16	Black Panther	200000000.0	700059566.0	1.348258e+09	500059566.0
33	34	2015-06-12	Jurassic World	215000000.0	652270625.0	1.648855e+09	437270625.0
43	44	2018-06-15	Incredibles 2	200000000.0	608581744.0	1.242521e+09	408581744.0
26	27	2012-05-04	The Avengers	225000000.0	623279547.0	1.517936e+09	398279547.0
6	7	2018-04-27	Avengers: Infinity War	300000000.0	678815482.0	2.048134e+09	378815482.0
134	35	2017-03-17	Beauty and the Beast	160000000.0	504014165.0	1.259200e+09	344014165.0
44	45	2016-12-16	Rogue One: A Star Wars Story	200000000.0	532177324.0	1.049103e+09	332177324.0
537	38	2012-03-23	The Hunger Games	80000000.0	408010692.0	6.779234e+08	328010692.0
437	38	2017-12-20	Jumanji: Welcome to the Jungle	90000000.0	404508916.0	9.644962e+08	314508916.0

In [17]:
```
#presenting the top domestic movies each year in a bar graph
#Plotting the bar graph
plt.figure(figsize=(10, 6))
plt.bar(Top_Domestic['movie'], Top_Domestic['Domestic Profit'], color='green')
plt.xlabel('Movie Title')
plt.ylabel('Domestic Profit')
plt.title('Top 10 Domestic')
plt.xticks(rotation=45, ha='right')
plt.tight_layout()
plt.show()
```



In [18]:
```
#presenting the top worldwide movies each year in a bar graph
Gross_Movies10.sort_values(by='Worlwide Profit', ascending=False)
```

Out[18]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domest Prof
6	7	2018-04-27	Avengers: Infinity War	300000000.0	678815482.0	2.048134e+09	378815482
5	6	2015-12-18	Star Wars Ep. VII: The Force Awakens	306000000.0	936662225.0	2.053311e+09	630662225
33	34	2015-06-12	Jurassic World	215000000.0	652270625.0	1.648855e+09	437270625
66	67	2015-04-03	Furious 7	190000000.0	353007020.0	1.518723e+09	163007020
26	27	2012-05-04	The Avengers	225000000.0	623279547.0	1.517936e+09	398279547
...	...	...	...	...	...	...	
480	81	2019-12-31	Army of the Dead	90000000.0	0.0	0.000000e+00	-90000000
341	42	2019-06-14	Men in Black: International	110000000.0	3100000.0	3.100000e+06	-106900000
193	94	2011-03-11	Mars Needs Moms	150000000.0	21392758.0	3.954976e+07	-128607242
194	95	2020-12-31	Moonfall	150000000.0	0.0	0.000000e+00	-150000000
2	3	2019-06-07	Dark Phoenix	350000000.0	42762350.0	1.497624e+08	-307237650

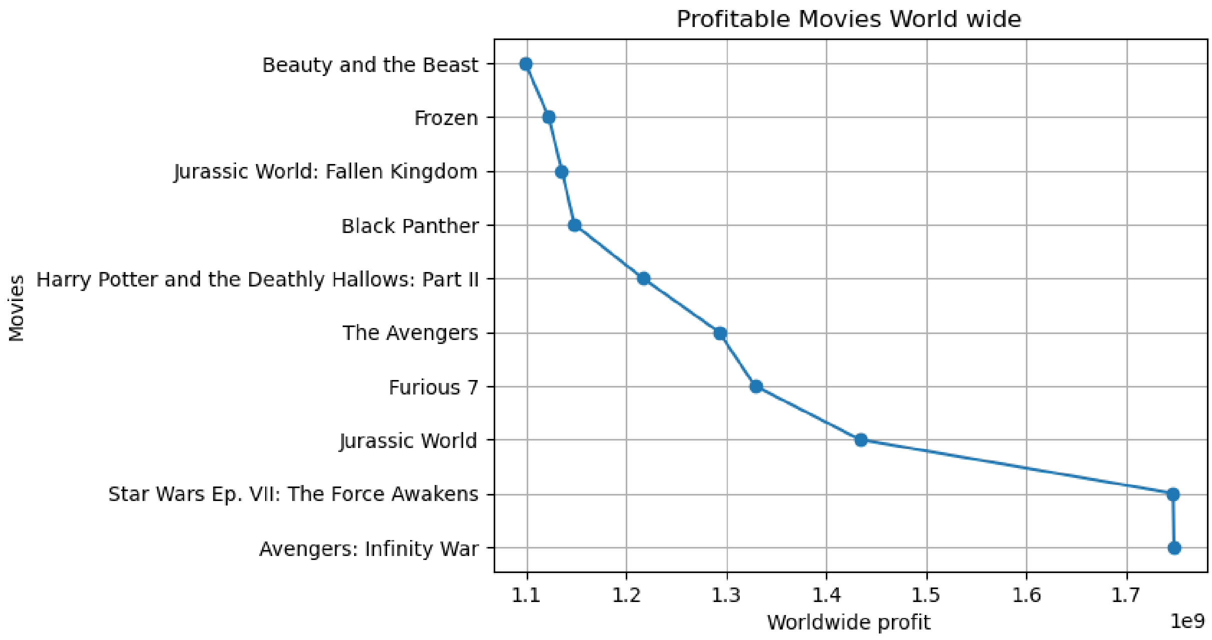
1935 rows × 8 columns

In [19]:
```
Top_Worldwide = Gross_Movies10.sort_values(by='Worlwide Profit', ascending=False).he
Top_Worldwide
```

Out[19]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domestic Profit
6	7	2018-04-27	Avengers: Infinity War	300000000.0	678815482.0	2.048134e+09	378815482.0
5	6	2015-12-18	Star Wars Ep. VII: The Force Awakens	306000000.0	936662225.0	2.053311e+09	630662225.0
33	34	2015-06-12	Jurassic World	215000000.0	652270625.0	1.648855e+09	437270625.0
66	67	2015-04-03	Furious 7	190000000.0	353007020.0	1.518723e+09	163007020.0
26	27	2012-05-04	The Avengers	225000000.0	623279547.0	1.517936e+09	398279547.0
260	61	2011-07-15	Harry Potter and the Deathly Hallows: Part II	125000000.0	381193157.0	1.341693e+09	256193157.0
41	42	2018-02-16	Black Panther	200000000.0	700059566.0	1.348258e+09	500059566.0
112	13	2018-06-22	Jurassic World: Fallen Kingdom	170000000.0	417719760.0	1.305773e+09	247719760.0
155	56	2013-11-22	Frozen	150000000.0	400738009.0	1.272470e+09	250738009.0
134	35	2017-03-17	Beauty and the Beast	160000000.0	504014165.0	1.259200e+09	344014165.0

In [163…
```
# Data
x_values = Top_Worldwide['movie']  # Horizontal positions
y_values = Top_Worldwide['Worlwide Profit']       # Vertical positions

# Create a horizontal line graph
plt.plot(y_values, x_values, marker='o', linestyle='-')

# Labels and title
plt.xlabel('Worldwide profit')
plt.ylabel('Movies')
plt.title('Profitable Movies World wide')

# Show the graph
plt.grid(True)  # Optionally add grid lines
plt.show()
```



In [24]:
```
#Assigning genres
Movies = Top_Domestic['movie']
print(Movies)
```

```
5      Star Wars Ep. VII: The Force Awakens
41                            Black Panther
33                           Jurassic World
43                            Incredibles 2
26                              The Avengers
6                    Avengers: Infinity War
134                    Beauty and the Beast
44             Rogue One: A Star Wars Story
537                        The Hunger Games
437          Jumanji: Welcome to the Jungle
Name: movie, dtype: object
```

In [22]:
```
#To find out about the movie genres from a set of data that has classified them
Top_Genres = pd.read_csv("C:/Users/HP/Documents/Flatiron/Project/phase1/dsc-phase-1-
Top_Genres
```

Out[22]:

	tconst	primary_title	original_title	start_year	runtime_minutes	genres
0	tt0063540	Sunghursh	Sunghursh	2013	175.0	Action,Crime,Drama
1	tt0066787	One Day Before the Rainy Season	Ashad Ka Ek Din	2019	114.0	Biography,Drama
2	tt0069049	The Other Side of the Wind	The Other Side of the Wind	2018	122.0	Drama
3	tt0069204	Sabse Bada Sukh	Sabse Bada Sukh	2018	NaN	Comedy,Drama
4	tt0100275	The Wandering Soap Opera	La Telenovela Errante	2017	80.0	Comedy,Drama,Fantasy
...	...	...	...	...	...	...
146139	tt9916538	Kuambil Lagi Hatiku	Kuambil Lagi Hatiku	2019	123.0	Drama
146140	tt9916622	Rodolpho Teóphilo - O	Rodolpho Teóphilo - O	2015	NaN	Documentary

	tconst	primary_title	original_title	start_year	runtime_minutes	genres
		Legado de um Pioneiro	Legado de um Pioneiro			
146141	tt9916706	Dankyavar Danka	Dankyavar Danka	2013	NaN	Comedy
146142	tt9916730	6 Gunn	6 Gunn	2017	116.0	NaN
146143	tt9916754	Chico Albuquerque - Revelações	Chico Albuquerque - Revelações	2013	NaN	Documentary

146144 rows × 6 columns

In [23]:
```
#Iterating through top Top_Genres database to find out the genre of the Top domestic
for index, row in Top_Domestic.iterrows():
    name = row['movie']
    matching_row = Top_Genres[Top_Genres['original_title'] == name]

    if not matching_row.empty:

        genre_name = matching_row['genres'].values[0]
        print(f"Match found for Name: {name}")
        print(f"Genre ID: {genre_name}")
```

```
Match found for Name: Black Panther
Genre ID: Action,Adventure,Sci-Fi
Match found for Name: Jurassic World
Genre ID: Action,Adventure,Sci-Fi
Match found for Name: Incredibles 2
Genre ID: Action,Adventure,Animation
Match found for Name: The Avengers
Genre ID: Action,Adventure,Sci-Fi
Match found for Name: Avengers: Infinity War
Genre ID: Action,Adventure,Sci-Fi
Match found for Name: Beauty and the Beast
Genre ID: Family,Fantasy,Musical
Match found for Name: The Hunger Games
Genre ID: Action,Adventure,Sci-Fi
Match found for Name: Jumanji: Welcome to the Jungle
Genre ID: Action,Adventure,Comedy
```

In [25]:
```
#create a dataframe after identifying the genres
data = {
    "Movies": [
        "Star Wars Ep. VII: The Force Awakens",
        "Black Panther",
        "Jurassic World",
        "Incredibles 2",
        "The Avengers",
        "Avengers: Infinity War",
        "Beauty and the Beast",
        "Rogue One: A Star Wars Story",
        "The Hunger Games",
        "Jumanji: Welcome to the Jungle",
    ],
    "Genres": [
        ['Action', 'Adventure', 'Fantasy'],
        ['Action', 'Adventure', 'Sci-Fi'],
        ['Action', 'Adventure', 'Sci-Fi'],
        ['Action','Adventure','Animation'],
        ['Action', 'Adventure', 'Sci-Fi'],
        ['Action', 'Adventure', 'Sci-Fi'],
        ['Family,Fantasy,Musical'],
        ['Action', 'Adventure', 'Fantasy'],
        ['Action', 'Adventure', 'Sci-Fi'],
        ['Action','Adventure','Comedy'],
    ],
}

Genres_id = pd.DataFrame(data)
print(Genres_id)
```

```
                                  Movies                         Genres
0  Star Wars Ep. VII: The Force Awakens    [Action, Adventure, Fantasy]
1                          Black Panther     [Action, Adventure, Sci-Fi]
2                         Jurassic World     [Action, Adventure, Sci-Fi]
3                          Incredibles 2  [Action, Adventure, Animation]
4                           The Avengers     [Action, Adventure, Sci-Fi]
5                 Avengers: Infinity War     [Action, Adventure, Sci-Fi]
6                   Beauty and the Beast        [Family,Fantasy,Musical]
7           Rogue One: A Star Wars Story    [Action, Adventure, Fantasy]
8                       The Hunger Games     [Action, Adventure, Sci-Fi]
9         Jumanji: Welcome to the Jungle     [Action, Adventure, Comedy]
```

In [26]:

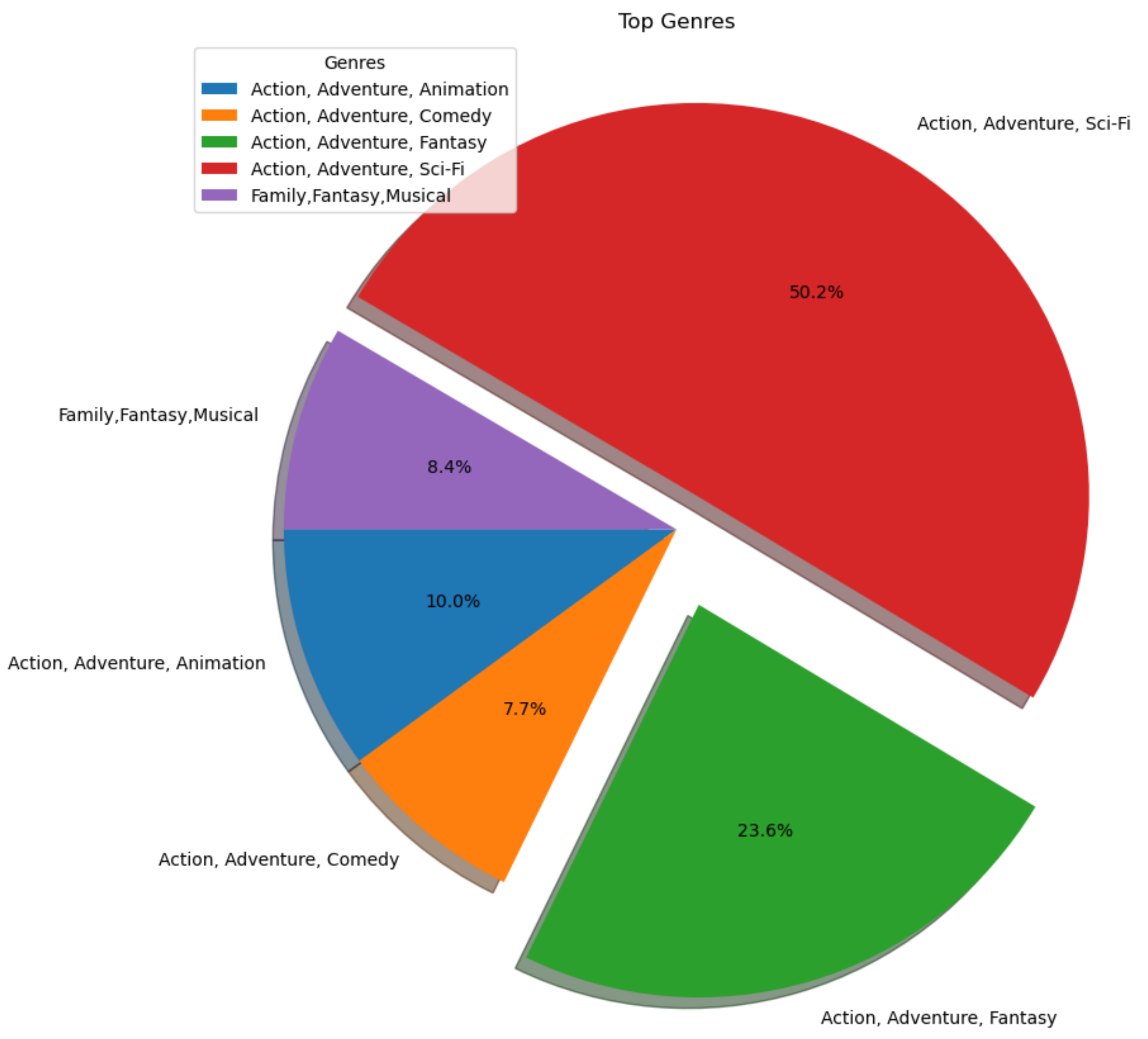
```
#Adding the genre column

new_values = []
for index, row in Top_Domestic.iterrows():
    movie_title = row['movie']
    matching_row = Genres_id[Genres_id['Movies'] == movie_title]

    if not matching_row.empty:
        genre_names = matching_row['Genres'].values[0]
        new_values.append(', '.join(genre_names))

    else:
        new_values.append(None)

Top_Domestic['Genre Name'] = new_values
Top_Domestic
```

Out[26]:

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domestic Profit
5	6	2015-12-18	Star Wars Ep. VII: The Force Awakens	306000000.0	936662225.0	2.053311e+09	630662225.0
41	42	2018-02-16	Black Panther	200000000.0	700059566.0	1.348258e+09	500059566.0
33	34	2015-06-12	Jurassic World	215000000.0	652270625.0	1.648855e+09	437270625.0
43	44	2018-06-15	Incredibles 2	200000000.0	608581744.0	1.242521e+09	408581744.0
26	27	2012-05-04	The Avengers	225000000.0	623279547.0	1.517936e+09	398279547.0
6	7	2018-04-27	Avengers: Infinity War	300000000.0	678815482.0	2.048134e+09	378815482.0
134	35	2017-03-17	Beauty and the Beast	160000000.0	504014165.0	1.259200e+09	344014165.0

	id	release_date	movie	production_budget	domestic_gross	worldwide_gross	Domestic Profit
44	45	2016-12-16	Rogue One: A Star Wars Story	200000000.0	532177324.0	1.049103e+09	332177324.0
537	38	2012-03-23	The Hunger Games	80000000.0	408010692.0	6.779234e+08	328010692.0
437	38	2017-12-20	Jumanji: Welcome to the Jungle	90000000.0	404508916.0	9.644962e+08	314508916.0

In [137…
```python
#Creating a pie chart for the top Genres Domestically

Grouped_data = {
    'Value': Top_Domestic['Domestic Profit'],
    'Category': Top_Domestic['Genre Name']
}

data_Chart = pd.DataFrame(Grouped_data)

# Combine similar genres categories
# Define a mapping of categories to combine

category_mapping = {
    'Action, Adventure, Sci-Fi': 'Action, Adventure, Sci-Fi',
    'Action, Adventure, Fantasy': 'Action, Adventure, Fantasy',
    'Action, Adventure, Animation': 'Action, Adventure, Animation',
    'Family,Fantasy,Musical': 'Family,Fantasy,Musical',
    'Action, Adventure, Comedy': 'Action, Adventure, Comedy',

}

# Apply the category mapping to combine similar categories
data_Chart['Category'] = data_Chart['Category'].map(category_mapping).fillna(data_Ch

# Group and aggregate the data
aggregate_data = data_Chart.groupby('Category')['Value'].sum().reset_index()
plt.figure(figsize=(10,14))
# Create a pie chart based on the aggregated data
plt.pie(aggregate_data['Value'], labels=aggregate_data['Category'], autopct='%1.1f%%
plt.title('Top Genres')


# Plotting a legend to explain categories
plt.legend(title = 'Genres')

# Display the pie chart
plt.show()
```



In [ ]:
```
#Deductions
```

In [66]:
```
#loading data into a dataframe and
Popular_Movies = pd.read_csv("C:/Users/HP/Documents/Flatiron/Project/phase1/dsc-phas
Popular_Movies
```

Out[66]:

	Unnamed: 0	genre_ids	id	original_language	original_title	popularity	release_date	
0	0	[12, 14, 10751]	12444	en	Harry Potter and the Deathly Hallows: Part 1	33.533	2010-11-19	ar H
1	1	[14, 12, 16, 10751]	10191	en	How to Train Your Dragon	28.734	2010-03-26	
2	2	[12, 28, 878]	10138	en	Iron Man 2	28.515	2010-05-07	
3	3	[16, 35, 10751]	862	en	Toy Story	28.005	1995-11-22	
4	4	[28, 878, 12]	27205	en	Inception	27.920	2010-07-16	
...	...	...	...	...	...	...	...	
26512	26512	[27, 18]	488143	en	Laboratory Conditions	0.600	2018-10-13	

	Unnamed: 0	genre_ids	id	original_language	original_title	popularity	release_date	
26513	26513	[18, 53]	485975	en	_EXHIBIT_84xxx_	0.600	2018-05-01	_E
26514	26514	[14, 28, 12]	381231	en	The Last One	0.600	2018-10-01	
26515	26515	[10751, 12, 28]	366854	en	Trailer Made	0.600	2018-06-22	
26516	26516	[53, 27]	309885	en	The Church	0.600	2018-10-05	

26517 rows × 10 columns

In [67]:
```
Popular_Movies.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 26517 entries, 0 to 26516
Data columns (total 10 columns):
 #   Column             Non-Null Count  Dtype  
---  ------             --------------  -----  
 0   Unnamed: 0         26517 non-null  int64  
 1   genre_ids          26517 non-null  object 
 2   id                 26517 non-null  int64  
 3   original_language  26517 non-null  object 
 4   original_title     26517 non-null  object 
 5   popularity         26517 non-null  float64
 6   release_date       26517 non-null  object 
 7   title              26517 non-null  object 
 8   vote_average       26517 non-null  float64
 9   vote_count         26517 non-null  int64  
dtypes: float64(2), int64(3), object(5)
memory usage: 2.0+ MB
```

In [79]:
```
#Narrowing down the data to only the latest 10years to make the analysis more releva

#Convert the date column 'release_date' to a date time format
Popular_Movies['release_date'] = pd.to_datetime(Popular_Movies['release_date'])
#Getting the latest date of the data set
Max_date = pd.to_datetime('2020-12-31')
#Getting the start date for the 10years period parameters
start_date = latest_date - pd.DateOffset(years=10)
#Getting the movies in the 10year period from the start date to the latest date
Popular_Movies = Popular_Movies[(Popular_Movies['release_date'] >= start_date) & (Po
Popular_Movies
```

Out[79]:

	Unnamed: 0	genre_ids	id	original_language	original_title	popularity	release_date	
258	258	[18, 35]	39356	en	Boy	7.759	2012-03-02	
289	289	[35, 18]	46829	en	Barney's Version	7.357	2011-01-14	
358	358	[10751, 16]	41066	ja	レイトン教授と永遠の歌姫	6.308	2010-12-31	L
386	386	[18]	54602	en	Skateland	5.938	2011-05-13	
409	409	[28, 18, 53]	56812	es	Balada triste de trompeta	5.552	2011-08-19	T
...	...	...	...	...	...	...	...	

	Unnamed: 0	genre_ids	id	original_language	original_title	popularity	release_date	
26512	26512	[27, 18]	488143	en	Laboratory Conditions	0.600	2018-10-13	
26513	26513	[18, 53]	485975	en	_EXHIBIT_84xxx_	0.600	2018-05-01	_E
26514	26514	[14, 28, 12]	381231	en	The Last One	0.600	2018-10-01	
26515	26515	[10751, 12, 28]	366854	en	Trailer Made	0.600	2018-06-22	
26516	26516	[53, 27]	309885	en	The Church	0.600	2018-10-05	

23892 rows × 10 columns

In [80]:
```
#Getting the 10 most popular movies using the popularity index
Popular_Movies = Popular_Movies.sort_values(by='popularity', ascending=False).head(1
Popular_Movies
```

Out[80]:

	Unnamed: 0	genre_ids	id	original_language	original_title	popularity	release_date	
23811	23811	[12, 28, 14]	299536	en	Avengers: Infinity War	80.773	2018-04-27	Av Infin
11019	11019	[28, 53]	245891	en	John Wick	78.123	2014-10-24	Joh
23812	23812	[28, 12, 16, 878, 35]	324857	en	Spider-Man: Into the Spider-Verse	60.534	2018-12-14	S Ma the S
11020	11020	[28, 12, 14]	122917	en	The Hobbit: The Battle of the Five Armies	53.783	2014-12-17	The H The of t
5179	5179	[878, 28, 12]	24428	en	The Avengers	50.289	2012-05-04	Av
11021	11021	[28, 878, 12]	118340	en	Guardians of the Galaxy	49.606	2014-08-01	Gua
23813	23813	[878, 28, 53]	335984	en	Blade Runner 2049	48.571	2017-10-06	I
20617	20617	[878, 28, 53]	335984	en	Blade Runner 2049	48.571	2017-10-06	I
23814	23814	[12]	338952	en	Fantastic Beasts: The Crimes of Grindelwald	48.508	2018-11-16	Fa Beas Cri Grind
23815	23815	[10751, 16, 35, 14, 12]	404368	en	Ralph Breaks the Internet	48.057	2018-11-21	Bre I

In [81]:
```
#Iterating through top Top_Genres database to find out the genres of the most popula
for index, row in Popular_Movies.iterrows():
    name = row['title']
    matching_row = Top_Genres[Top_Genres['original_title'] == name]

    if not matching_row.empty:

        genre_name = matching_row['genres'].values[0]
        print(f"Match found for Name: {name}")
        print(f"Genre ID: {genre_name}")
```

```
Match found for Name: Avengers: Infinity War
Genre ID: Action,Adventure,Sci-Fi
Match found for Name: John Wick
Genre ID: Action,Crime,Thriller
Match found for Name: Spider-Man: Into the Spider-Verse
Genre ID: Action,Adventure,Animation
Match found for Name: The Hobbit: The Battle of the Five Armies
Genre ID: Adventure,Fantasy
Match found for Name: The Avengers
Genre ID: Action,Adventure,Sci-Fi
Match found for Name: Guardians of the Galaxy
Genre ID: Action,Adventure,Comedy
Match found for Name: Blade Runner 2049
Genre ID: Drama,Mystery,Sci-Fi
Match found for Name: Blade Runner 2049
Genre ID: Drama,Mystery,Sci-Fi
Match found for Name: Fantastic Beasts: The Crimes of Grindelwald
Genre ID: Adventure,Family,Fantasy
Match found for Name: Ralph Breaks the Internet
Genre ID: Adventure,Animation,Comedy
```

In [96]:
```
#create a dataframe after identifying the genres
data = {
    "Movies": [
        "Avengers: Infinity War",
        "John Wick",
        "Spider-Man: Into the Spider-Verse",
        "The Hobbit: The Battle of the Five Armies",
        "The Avengers",
        "Guardians of the Galaxy",
        "Blade Runner 2049",
        "Blade Runner 2049",
        "Fantastic Beasts: The Crimes of Grindelwald",
        "Ralph Breaks the Internet",
    ],
    "Genres": [
        ['Action','Adventure','Sci-Fi'],
        ['Action','Crime','Thriller'],
        ['Action','Adventure','Animation'],
        ['Adventure','Fantasy'],
        ['Action','Adventure','Sci-Fi'],
        ['Action','Adventure','Comedy'],
        ['Drama','Mystery','Sci-Fi'],
        ['Drama','Mystery','Sci-Fi'],
        ['Adventure','Family','Fantasy'],
        ['Adventure','Animation','Comedy'],
    ],
}


for i, genres in enumerate(data["Genres"]):
    if len(genres) < len(data["Movies"]):
        data["Genres"][i].extend(['Missing'] * (len(data["Movies"]) - len(genres)))
```

```
Pop_Genres = pd.DataFrame(data)
print(Pop_Genres )
```

```
                                        Movies  \
0                       Avengers: Infinity War
1                                    John Wick
2               Spider-Man: Into the Spider-Verse
3    The Hobbit: The Battle of the Five Armies
4                                 The Avengers
5                      Guardians of the Galaxy
6                            Blade Runner 2049
7                            Blade Runner 2049
8  Fantastic Beasts: The Crimes of Grindelwald
9                     Ralph Breaks the Internet

                                              Genres
0  [Action, Adventure, Sci-Fi, Missing, Missing, ...
1  [Action, Crime, Thriller, Missing, Missing, Mi...
2  [Action, Adventure, Animation, Missing, Missin...
3  [Adventure, Fantasy, Missing, Missing, Missing...
4  [Action, Adventure, Sci-Fi, Missing, Missing, ...
5  [Action, Adventure, Comedy, Missing, Missing, ...
6  [Drama, Mystery, Sci-Fi, Missing, Missing, Mis...
7  [Drama, Mystery, Sci-Fi, Missing, Missing, Mis...
8  [Adventure, Family, Fantasy, Missing, Missing,...
9  [Adventure, Animation, Comedy, Missing, Missin...
```

In [102…

```
#Adding the genre column
new_values = []
for index, row in Popular_Movies.iterrows():
    name = row['title']
    matching_row = Top_Genres[Top_Genres['original_title'] == name]

    if not matching_row.empty:
        genre_names = matching_row['genres'].values[0]
        new_values.append(''.join(filter(None, genre_names)))
    else:
        new_values.append(None)

Popular_Movies['Genre Name'] = new_values
Popular_Movies
```

Out[102…

	Unnamed: 0	genre_ids	id	original_language	original_title	popularity	release_date	
23811	23811	[12, 28, 14]	299536	en	Avengers: Infinity War	80.773	2018-04-27	Av Infin
11019	11019	[28, 53]	245891	en	John Wick	78.123	2014-10-24	Joh
23812	23812	[28, 12, 16, 878, 35]	324857	en	Spider-Man: Into the Spider-Verse	60.534	2018-12-14	S Ma the S
11020	11020	[28, 12, 14]	122917	en	The Hobbit: The Battle of the Five Armies	53.783	2014-12-17	The I The of t
5179	5179	[878, 28, 12]	24428	en	The Avengers	50.289	2012-05-04	Av
11021	11021	[28, 878, 12]	118340	en	Guardians of the Galaxy	49.606	2014-08-01	Gu

	Unnamed: 0	genre_ids	id	original_language	original_title	popularity	release_date	
23813	23813	[878, 28, 53]	335984	en	Blade Runner 2049	48.571	2017-10-06	
20617	20617	[878, 28, 53]	335984	en	Blade Runner 2049	48.571	2017-10-06	
23814	23814	[12]	338952	en	Fantastic Beasts: The Crimes of Grindelwald	48.508	2018-11-16	Fa Beas Cri Grinc
23815	23815	[10751, 16, 35, 14, 12]	404368	en	Ralph Breaks the Internet	48.057	2018-11-21	Bre I

In [104…

```python
#getting the most popular Genre by Popularity index
Popular_Movies.describe()
```

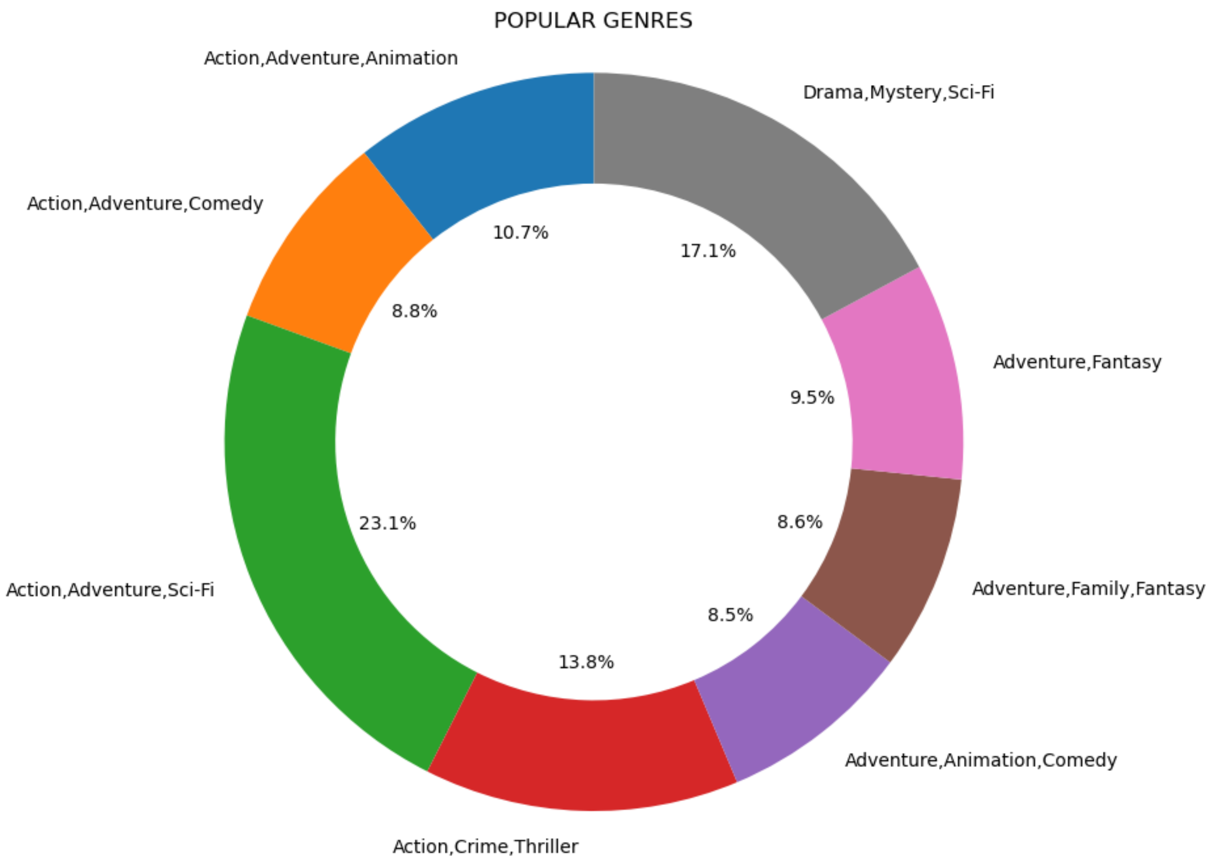
Out[104…

	Unnamed: 0	id	popularity	vote_average	vote_count
count	10.000000	10.000000	10.000000	10.000000	10.000000
mean	17792.100000	255125.700000	56.681500	7.560000	9495.400000
std	7347.793039	124144.694939	12.592134	0.492612	5875.623583
min	5179.000000	24428.000000	48.057000	6.900000	2626.000000
25%	11020.250000	153660.500000	48.571000	7.225000	5322.250000
50%	22214.000000	312196.500000	49.947500	7.400000	7535.500000
75%	23812.750000	335984.000000	58.846250	7.825000	12981.250000
max	23815.000000	404368.000000	80.773000	8.400000	19673.000000

In [159…

```python
#Columns to use
Dough_data = {
    "Category": Popular_Movies['Genre Name'],
    "Value":Popular_Movies['popularity'],
}

Top = pd.DataFrame(Dough_data)

category_mapping = {
    'Action, Adventure, Sci-Fi': 'Action, Adventure, Sci-Fi',
    'Action, Crime, Thriller': 'Action, Crime, Thriller',
    'Action, Adventure, Animation': 'Action, Adventure, Animation',
    'Adventure, Fantasy': 'Adventure, Fantasy',
    'Action, Adventure, Comedy': 'Action, Adventure, Comedy',
    'Drama, Mystery, Sci-Fi': 'Drama, Mystery, Sci-Fi',
    'Adventure, Family, Fantasy': 'Adventure, Family, Fantasy',
    'Adventure, Animation, Comedy': 'Adventure, Animation, Comedy',
}

# Apply the category mapping to combine similar categories
Top['Category'] = Top['Category'].map(category_mapping).fillna(Top['Category'])

# Group and aggregate the data
```

```
aggregate_data = Top.groupby('Category')['Value'].sum().reset_index()

plt.figure(figsize=(8, 8))

# Draw the outer pie chart
plt.pie(aggregate_data['Value'], labels=aggregate_data['Category'], autopct='%1.1f%%

# Draw the inner pie chart (donut hole)
centre_circle = plt.Circle((0, 0), 0.5, color='white', fc='white', linewidth=1.25)
fig = plt.gcf()
fig.gca().add_artist(centre_circle)

# Set aspect ratio to be equal, so the pie is drawn as a circle.
plt.axis('equal')
plt.title('POPULAR GENRES')
plt.show()
```



```
In [ ]: #Conclusions
```