Final Project Submission

Please fill out:

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- Student pace: full time
- Scheduled project review date/time: 12/3/2023
- Instructor name: William Okomba
- Blog post URL:

In [1]:
```
# Let us first start by importing all the required libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import sqlite3
import csv

%matplotlib inline
```

PROBLEM STATEMENT

We want to determine

1-the genre of films are currently doing best in the market.

2- Best movie writers in the industry

3- Top leading studios that will offer competition or microsoft should seek to patner with

To know the above, I will use the exploratory data analysis on several datasets to generate insights for Microsoft and give recommendations

LOADING THE DATA FILES

In [2]:
```
#loading the csv file
movie = pd.read_csv("bom.movie_gross.csv")
```

In [3]:
```
#loading the database
conn= sqlite3.connect("im.db")
```

UNDERSTANDING THE DATA

first we want to understand the Movie dataset

In [4]:
```
movie.columns
```
Out[4]:
```
Index(['title', 'studio', 'domestic_gross', 'foreign_gross', 'year'], dtype
='object')
```

In [5]:
```
movie.head()
```
Out[5]:

	title	studio	domestic_gross	foreign_gross	year
0	Toy Story 3	BV	415000000.0	652000000	2010
1	Alice in Wonderland (2010)	BV	334200000.0	691300000	2010
2	Harry Potter and the Deathly Hallows Part 1	WB	296000000.0	664300000	2010
3	Inception	WB	292600000.0	535700000	2010
4	Shrek Forever After	P/DW	238700000.0	513900000	2010

In [6]:
```
movie.head(10)
```
Out[6]:

	title	studio	domestic_gross	foreign_gross	year
0	Toy Story 3	BV	415000000.0	652000000	2010
1	Alice in Wonderland (2010)	BV	334200000.0	691300000	2010
2	Harry Potter and the Deathly Hallows Part 1	WB	296000000.0	664300000	2010
3	Inception	WB	292600000.0	535700000	2010
4	Shrek Forever After	P/DW	238700000.0	513900000	2010
5	The Twilight Saga: Eclipse	Sum.	300500000.0	398000000	2010
6	Iron Man 2	Par.	312400000.0	311500000	2010
7	Tangled	BV	200800000.0	391000000	2010
8	Despicable Me	Uni.	251500000.0	291600000	2010
9	How to Train Your Dragon	P/DW	217600000.0	277300000	2010

In [7]:
```
movie.tail()
```
Out[7]:

	title	studio	domestic_gross	foreign_gross	year
3382	The Quake	Magn.	6200.0	NaN	2018
3383	Edward II (2018 re-release)	FM	4800.0	NaN	2018
3384	El Pacto	Sony	2500.0	NaN	2018
3385	The Swan	Synergetic	2400.0	NaN	2018
3386	An Actor Prepares	Grav.	1700.0	NaN	2018

In [8]:
```
movie.shape
```
Out[8]:
```
(3387, 5)
```

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

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3387 entries, 0 to 3386
Data columns (total 5 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   title           3387 non-null   object 
 1   studio          3382 non-null   object 
 2   domestic_gross  3359 non-null   float64
 3   foreign_gross   2037 non-null   object 
 4   year            3387 non-null   int64  
dtypes: float64(1), int64(1), object(3)
memory usage: 132.4+ KB
```

In [10]:
```
movie.describe()
```

Out[10]:

	domestic_gross	year
count	3.359000e+03	3387.000000
mean	2.874585e+07	2013.958075
std	6.698250e+07	2.478141
min	1.000000e+02	2010.000000
25%	1.200000e+05	2012.000000
50%	1.400000e+06	2014.000000
75%	2.790000e+07	2016.000000
max	9.367000e+08	2018.000000

In [11]:
```
movie.nunique()
```

Out[11]:
```
title             3386
studio             257
domestic_gross    1797
foreign_gross     1204
year                 9
dtype: int64
```

From the above information, we can understand there are missing values in studio, domestic_gross and foreign_gross columns. Additionally, we understand the mean of the movie data and the median data. This enables us to slightly understand the distribution of the dataset

UNDERSTANDING THE DATA FOR THE IM.DB DATASET

since this is a databse, well use sqlite3 to understand the data

In [12]:
```
#First we want to fetch  the table names from the data base
df= pd.read_sql('''SELECT name
            FROM sqlite_master
            WHERE type='table';
            ''', conn)
df
```

Out[12]:

	name
0	movie_basics
1	directors
2	known_for
3	movie_akas
4	movie_ratings
5	persons
6	principals
7	writers

We now want to understand columns that each table contains from the 8 tables in the database

In [13]:
```
#understanding the directors table
directors=pd.read_sql('''SELECT *
                FROM directors
                ;''', conn).head()
```

In [14]:
```
#understanding the movie basics table
movie_basic=pd.read_sql('''SELECT *
                            FROM movie_basics;
                            ''', conn)
movie_basic.head()
```

Out[14]:

	movie_id	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

In [15]:
```
#understanding the known for table
known_for= pd.read_sql('''SELECT *
                            FROM known_for;
                            ''', conn)
known_for.head()
```

Out[15]:

	person_id	movie_id
0	nm0061671	tt0837562
1	nm0061671	tt2398241
2	nm0061671	tt0844471
3	nm0061671	tt0118553
4	nm0061865	tt0896534

In [16]:
```
#understanding movie_akas table
movie_akas= pd.read_sql(''' SELECT *
                            FROM movie_akas;
                             ''', conn )
movie_akas.head()
```

Out[16]:

	movie_id	ordering	title	region	language	types	attributes	is_original_title
0	tt0369610	10	Джурасик свят	BG	bg	None	None	0.0
1	tt0369610	11	Jurashikku warudo	JP	None	imdbDisplay	None	0.0
2	tt0369610	12	Jurassic World: O Mundo dos Dinossauros	BR	None	imdbDisplay	None	0.0
3	tt0369610	13	O Mundo dos Dinossauros	BR	None	None	short title	0.0
4	tt0369610	14	Jurassic World	FR	None	imdbDisplay	None	0.0

In [17]:
```
#understanding movie_ratings table
movie_ratings= pd.read_sql('''SELECT *
                                FROM movie_ratings;
                                ''', conn)
movie_ratings.head()
```

Out[17]:

	movie_id	averagerating	numvotes
0	tt10356526	8.3	31
1	tt10384606	8.9	559
2	tt1042974	6.4	20
3	tt1043726	4.2	50352
4	tt1060240	6.5	21

In [18]:
```
#understanding persons table
persons=pd.read_sql(''' SELECT *
                        FROM persons;
                        ''', conn)
persons.head()
```

Out[18]:

	person_id	primary_name	birth_year	death_year	primary_profess
0	nm0061671	Mary Ellen Bauder	NaN	NaN	miscellaneous,production_manager,produ
1	nm0061865	Joseph Bauer	NaN	NaN	composer,music_department,sound_departn
2	nm0062070	Bruce Baum	NaN	NaN	miscellaneous,actor,w
3	nm0062195	Axel Baumann	NaN	NaN	camera_department,cinematographer,art_departn
4	nm0062798	Pete Baxter	NaN	NaN	production_designer,art_department,set_decor

In [19]:
```
#understanding principals table
principals= pd.read_sql('''SELECT *
                            FROM principals;
                            ''', conn)
principals.head()
```

Out[19]:

	movie_id	ordering	person_id	category	job	characters
0	tt0111414	1	nm0246005	actor	None	["The Man"]
1	tt0111414	2	nm0398271	director	None	None
2	tt0111414	3	nm3739909	producer	producer	None
3	tt0323808	10	nm0059247	editor	None	None
4	tt0323808	1	nm3579312	actress	None	["Beth Boothby"]

In [20]:
```
#understanding the writers table
writers= pd.read_sql('''SELECT *
                        FROM writers;
                        ''', conn)
writers.head()
```

Out[20]:

	movie_id	person_id
0	tt0285252	nm0899854
1	tt0438973	nm0175726
2	tt0438973	nm1802864
3	tt0462036	nm1940585
4	tt0835418	nm0310087

we now have an understanding of what eaxch table contains and som relation between different tables.

DATA CLEANING

cleaning of the movie data set

In [21]:
```
#null values
movie.isnull()
```

Out[21]:

	title	studio	domestic_gross	foreign_gross	year
0	False	False	False	False	False
1	False	False	False	False	False
2	False	False	False	False	False
3	False	False	False	False	False
4	False	False	False	False	False
...	...	...	...	...	...
3382	False	False	False	True	False
3383	False	False	False	True	False
3384	False	False	False	True	False
3385	False	False	False	True	False
3386	False	False	False	True	False

3387 rows × 5 columns

In [22]:
```
movie.isnull().sum()
```

Out[22]:
```
title                0
studio               5
domestic_gross      28
foreign_gross     1350
year                 0
dtype: int64
```

we see foreign_gross has 1350 missing values in its column, 28 and 5 for domestic_gross and studio respectively

In [23]:
```
#we create a function to replace the text values to integers
def column_text_to_integer(df, column):
    df[column]= df[column].apply(pd.to_numeric, errors="coerce")
    return df[column]
```

In [24]:
```
#let us convert for the foreign_gross column
column_text_to_integer(movie, "foreign_gross")
```

Out[24]:
```
0       652000000.0
1       691300000.0
2       664300000.0
3       535700000.0
4       513900000.0
           ...
3382            NaN
3383            NaN
3384            NaN
3385            NaN
3386            NaN
Name: foreign_gross, Length: 3387, dtype: float64
```

In [25]:
```
#mean for foreign_gross
mean_foreign_gross= movie.foreign_gross.mean()
mean_foreign_gross
```

Out[25]:
```
75057041.62549213
```

In [26]:
```
#median for foreign_gross
median_foreign_gross= movie.foreign_gross.median()
median_foreign_gross
```

Out[26]:
```
18900000.0
```

In [27]:
```
#median for domestic_gross
median_domestic_gross= movie.domestic_gross.median()
median_domestic_gross
```

Out[27]:
```
1400000.0
```

In [28]:
```
#we create a function to find outliers
def outliers(data):
    q3=data.quantile(0.75)
    q1=data.quantile(0.25)
    IQR= q3 - q1
    outliers= data[(data < (q1- 1.5*IQR)) | (data > (q3 + 1.5*IQR))]
    return outliers
```

In [29]:
```
#outliers in the foreign_gross
outliers(movie.foreign_gross).count()
```

Out[29]:
```
260
```

In [30]:
```
#outliers in domestic_gross
outliers(movie.domestic_gross).count()
```

Out[30]:
```
406
```

let us relace the missing values in foreign_gross and domestic gross with their median

In [31]:
```
movie.foreign_gross.fillna(median_foreign_gross, inplace=True)
```

In [32]:
```
movie.domestic_gross.fillna(median_domestic_gross, inplace=True)
```

let us drop the missing values studio since we cant replace the crucial data

In [33]:
```
movie.dropna(inplace=True)
```

In [34]:
```
movie.isnull().sum()
```

Out[34]:
```
title             0
studio            0
domestic_gross    0
foreign_gross     0
year              0
dtype: int64
```

Cleaning of the IM.DB data set

The movie rating and the moving basics are the important tables in the data set so we join them

In [35]:
```
movie_basics_rating= pd.read_sql('''SELECT *
                                            FROM movie_ratings
                                            JOIN movie_basics
                                            USING (movie_id);
                                            ''', conn)
movie_basics_rating.head()
```

Out[35]:

	movie_id	averagerating	numvotes	primary_title	original_title	start_year	runtime_minutes
0	tt10356526	8.3	31	Laiye Je Yaarian	Laiye Je Yaarian	2019	117.0
1	tt10384606	8.9	559	Borderless	Borderless	2019	87.0
2	tt1042974	6.4	20	Just Inès	Just Inès	2010	90.0
3	tt1043726	4.2	50352	The Legend of Hercules	The Legend of Hercules	2014	99.0
4	tt1060240	6.5	21	Até Onde?	Até Onde?	2011	73.0

In [36]:
```
movie_rating_writers= pd.read_sql('''SELECT *
                                     FROM movie_ratings
                                     JOIN writers
                                     USING (movie_id);
                                     ''', conn)

movie_rating_writers
```

Out[36]:

	movie_id	averagerating	numvotes	person_id
0	tt10356526	8.3	31	nm3057599
1	tt10356526	8.3	31	nm4179342
2	tt1042974	6.4	20	nm1915232
3	tt1043726	4.2	50352	nm0001317
4	tt1043726	4.2	50352	nm0316417
...	...	...	...	...
169298	tt9708284	4.9	19	nm2203315
169299	tt9708284	4.9	19	nm2628394
169300	tt9722952	7.0	6	nm7620676
169301	tt9844256	7.5	24	nm0849465
169302	tt9844256	7.5	24	nm1287521

169303 rows × 4 columns

In [37]:
```
#Let us rename averagerating to average_rating
movie_basics_rating.columns=movie_basics_rating.columns.str.lower().str.replac
movie_rating_writers.columns=movie_rating_writers.columns.str.lower().str.repl
```

In [38]:
```
movie_basics_rating
```

Out[38]:

	movie_id	average_rating	numvotes	primary_title	original_title	start_year	runtime_minu
0	tt10356526	8.3	31	Laiye Je Yaarian	Laiye Je Yaarian	2019	1
1	tt10384606	8.9	559	Borderless	Borderless	2019	8
2	tt1042974	6.4	20	Just Inès	Just Inès	2010	9
3	tt1043726	4.2	50352	The Legend of Hercules	The Legend of Hercules	2014	9
4	tt1060240	6.5	21	Até Onde?	Até Onde?	2011	7
...	...	...	...	...	...	...	
73851	tt9805820	8.1	25	Caisa	Caisa	2018	8
73852	tt9844256	7.5	24	Code Geass: Lelouch of the Rebellion - Glorifi...	Code Geass: Lelouch of the Rebellion Episode III	2018	12
73853	tt9851050	4.7	14	Sisters	Sisters	2019	N
73854	tt9886934	7.0	5	The Projectionist	The Projectionist	2019	8
73855	tt9894098	6.3	128	Sathru	Sathru	2019	12

73856 rows × 8 columns

In [39]:
```
movie_rating_writers
```

Out[39]:

	movie_id	average_rating	numvotes	person_id
0	tt10356526	8.3	31	nm3057599
1	tt10356526	8.3	31	nm4179342
2	tt1042974	6.4	20	nm1915232
3	tt1043726	4.2	50352	nm0001317
4	tt1043726	4.2	50352	nm0316417
...	...	...	...	...
169298	tt9708284	4.9	19	nm2203315
169299	tt9708284	4.9	19	nm2628394
169300	tt9722952	7.0	6	nm7620676
169301	tt9844256	7.5	24	nm0849465
169302	tt9844256	7.5	24	nm1287521

169303 rows × 4 columns

In [40]:
```
#let us check for number of null values in each table
movie_rating_writers.isnull().sum()
```

Out[40]:
```
movie_id          0
average_rating    0
numvotes          0
person_id         0
dtype: int64
```

In [41]:
```
movie_basics_rating.isnull().sum()
```

Out[41]:
```
movie_id              0
average_rating        0
numvotes              0
primary_title         0
original_title        0
start_year            0
runtime_minutes    7620
genres              804
dtype: int64
```

In [42]:
```
movie_basics_rating.isnull()
```

Out[42]:

	movie_id	average_rating	numvotes	primary_title	original_title	start_year	runtime_minut
0	False	False	False	False	False	False	Fal
1	False	False	False	False	False	False	Fal
2	False	False	False	False	False	False	Fal
3	False	False	False	False	False	False	Fal
4	False	False	False	False	False	False	Fal
...	...	...	...	...	...	...	
73851	False	False	False	False	False	False	Fal
73852	False	False	False	False	False	False	Fal
73853	False	False	False	False	False	False	Tr
73854	False	False	False	False	False	False	Fal
73855	False	False	False	False	False	False	Fal

73856 rows × 8 columns

In [43]:
```
#let us replace the null values in the genre column with unavailable since we c
movie_basics_rating.genres.fillna("unavailable", inplace=True)
```

In [44]:
```
movie_basics_rating
```

Out[44]:

	movie_id	average_rating	numvotes	primary_title	original_title	start_year	runtime_minu
0	tt10356526	8.3	31	Laiye Je Yaarian	Laiye Je Yaarian	2019	1
1	tt10384606	8.9	559	Borderless	Borderless	2019	8
2	tt1042974	6.4	20	Just Inès	Just Inès	2010	9
3	tt1043726	4.2	50352	The Legend of Hercules	The Legend of Hercules	2014	9
4	tt1060240	6.5	21	Até Onde?	Até Onde?	2011	7
...	...	...	...	...	...	...	
73851	tt9805820	8.1	25	Caisa	Caisa	2018	8
73852	tt9844256	7.5	24	Code Geass: Lelouch of the Rebellion - Glorifi...	Code Geass: Lelouch of the Rebellion Episode III	2018	12
73853	tt9851050	4.7	14	Sisters	Sisters	2019	N
73854	tt9886934	7.0	5	The Projectionist	The Projectionist	2019	8
73855	tt9894098	6.3	128	Sathru	Sathru	2019	12

73856 rows × 8 columns

In [45]:
```
#let us drop the missing values in running time
movie_basics_rating.dropna(inplace=True)
```

In [46]:
```
movie_basics_rating.isnull().sum()
```

Out[46]:
```
movie_id           0
average_rating     0
numvotes           0
primary_title      0
original_title     0
start_year         0
runtime_minutes    0
genres             0
dtype: int64
```

In [47]:
```
#checking for duplicates
movie_basics_rating.duplicated().sum()
```

Out[47]:
```
0
```

In [48]:
```
movie_rating_writers.duplicated().sum()
```

Out[48]:
```
57451
```

```
In [49]: movie_rating_writers.duplicated()

Out[49]: 0         False
         1         False
         2         False
         3         False
         4         False
                   ...  
         169298    False
         169299    False
         169300    False
         169301    False
         169302    False
         Length: 169303, dtype: bool
```

```
In [50]: movie_rating_writers.drop_duplicates(inplace=True)
         movie_rating_writers.duplicated().sum()

Out[50]: 0
```

since no duplicates or missing values we can proceed to analyze the data

DATA ANALYSIS

ANALYSIS FOR THE MOVIE DATA SET

```
In [51]: movie.describe()
```

Out[51]:

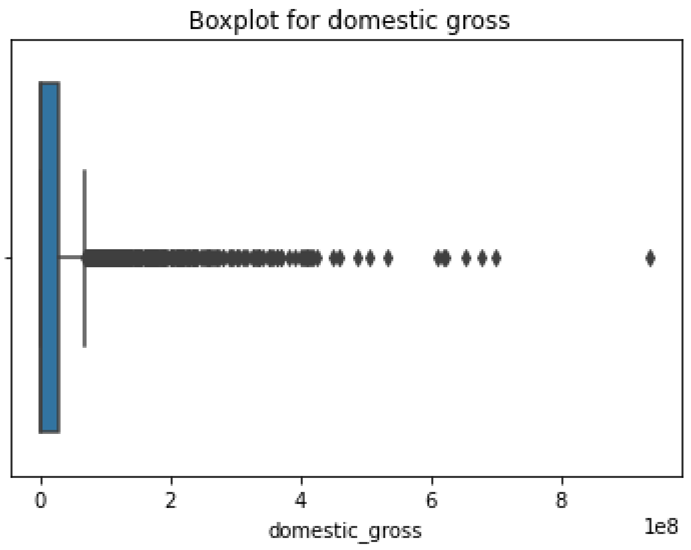
	domestic_gross	foreign_gross	year
count	3.382000e+03	3.382000e+03	3382.000000
mean	2.856106e+07	5.262386e+07	2013.959787
std	6.679161e+07	1.100744e+08	2.477735
min	1.000000e+02	6.000000e+02	2010.000000
25%	1.230000e+05	1.190000e+07	2012.000000
50%	1.400000e+06	1.890000e+07	2014.000000
75%	2.767500e+07	2.917500e+07	2016.000000
max	9.367000e+08	9.605000e+08	2018.000000

In [52]:
```
movie.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 3382 entries, 0 to 3386
Data columns (total 5 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   title           3382 non-null   object 
 1   studio          3382 non-null   object 
 2   domestic_gross  3382 non-null   float64
 3   foreign_gross   3382 non-null   float64
 4   year            3382 non-null   int64  
dtypes: float64(2), int64(1), object(2)
memory usage: 158.5+ KB
```

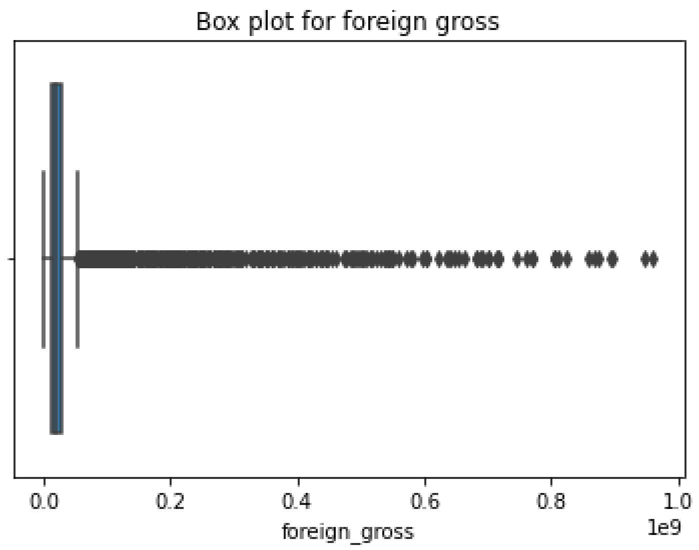
In [53]:
```
#plotting a boxplot for domestic_gross and foreign_gross to check outliers
fig, ax = plt.subplots()
sns.boxplot(movie.domestic_gross)
ax.set_title(" Boxplot for domestic gross")
plt.show()
```

```
c:\Users\Brian\anaconda3\New folder\envs\learn-env\lib\site-packages\seaborn
\_decorators.py:36: FutureWarning: Pass the following variable as a keyword a
rg: x. From version 0.12, the only valid positional argument will be `data`,
and passing other arguments without an explicit keyword will result in an err
or or misinterpretation.
  warnings.warn(
```

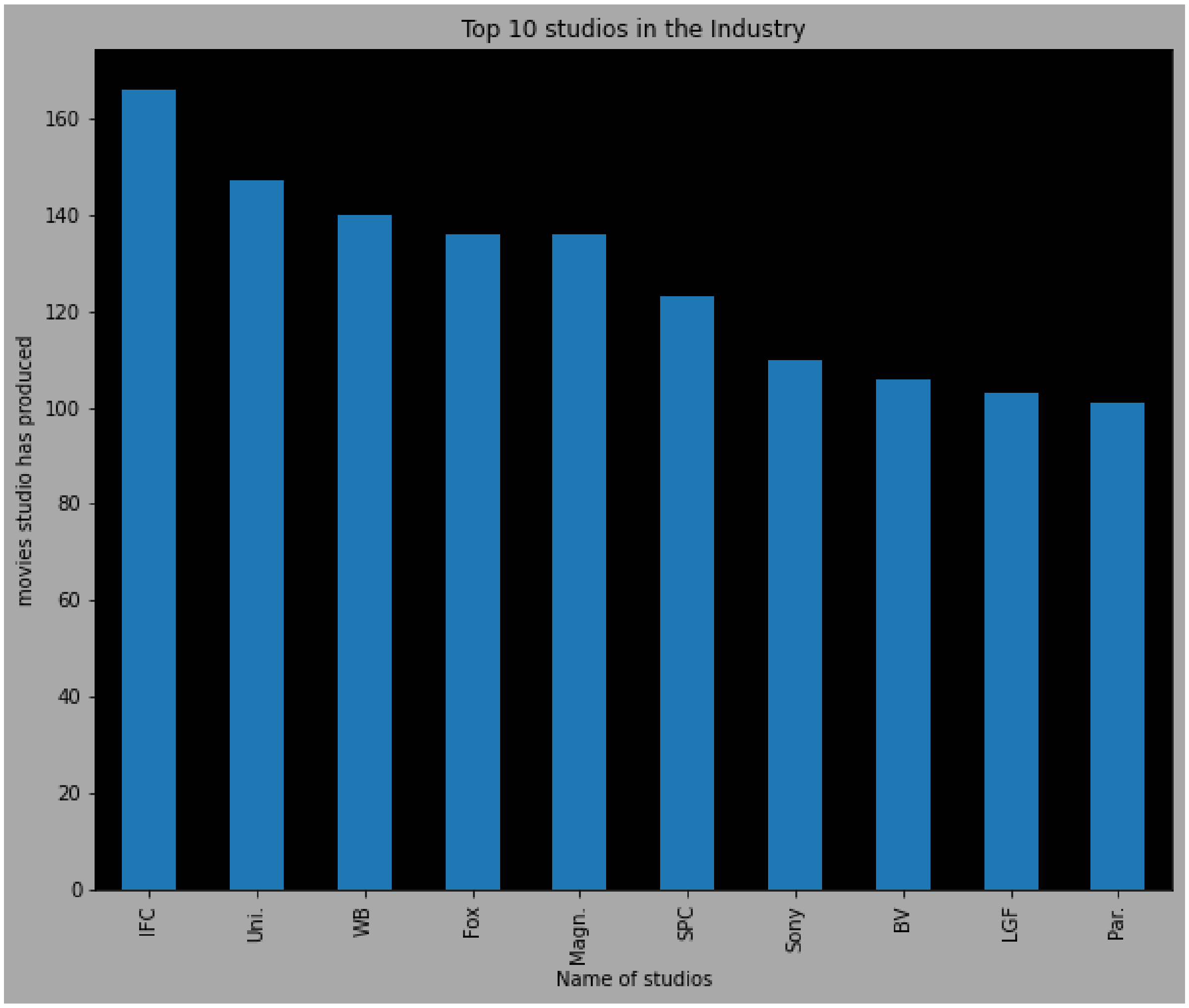


In [54]:
```
fig, ax= plt.subplots()
sns.boxplot(movie.foreign_gross)
ax.set_title("Box plot for foreign gross")
plt.show()
```

```
c:\Users\Brian\anaconda3\New folder\envs\learn-env\lib\site-packages\seaborn
\_decorators.py:36: FutureWarning: Pass the following variable as a keyword a
rg: x. From version 0.12, the only valid positional argument will be `data`,
and passing other arguments without an explicit keyword will result in an err
or or misinterpretation.
  warnings.warn(
```



In [55]:
```
#we want to see which are the top 10 studios
fig, ax= plt.subplots(figsize= (10, 8))
movie.studio.value_counts().head(10).plot.bar()
plt.xlabel("Name of studios", color= "black")
plt.ylabel("movies studio has produced", color="black")
plt.title("Top 10 studios in the Industry", color="black")
ax.set_facecolor("black")
fig.patch.set_facecolor("darkgrey");
```



Finding the measures of central tendancies for the Movie dataset

In [56]:
```
#We create a function for calculating mean
def mean(data):
    mean= sum(data)/ len(data)
    return mean
print("The mean for domestic gross is :", mean(movie.domestic_gross))
print("The mean for foreign gross is : ", mean(movie.foreign_gross))
```

```
The mean for domestic gross is : 28561064.15730337
The mean for foreign gross is :  52623864.15819042
```

In [57]:
```
#we create a function for calculating median
def median(data):
    sorted_data= sorted(data)
    data_length= len(sorted_data)
    middle_number= (data_length-1) // 2
    if middle_number % 2:
        return sorted_data[middle_number]
    else:
        return (sorted_data[middle_number] + sorted_data[middle_number+1])/2

print("The median for domestic gross is : ", median(movie.domestic_gross))
print("The median for foreign gross is : ", median(movie.foreign_gross))
```

```
The median for domestic gross is :  1400000.0
The median for foreign gross is :  18900000.0
```

In [58]:
```
# we create a determine the mode
print("The most occuring revenue for domestic gross is : ", (movie.domestic_gr
print("The most occuring revenue for foreign gross is : ", (movie.foreign_gros
```

```
The most occuring revenue for domestic gross is :  0    1400000.0
dtype: float64
The most occuring revenue for foreign gross is :  0    18900000.0
dtype: float64
```

In [59]:
```
#determining the range
print("domestic gross : ", movie.domestic_gross.max() - movie.domestic_gross.m
print(" Foreign gross : ", movie.foreign_gross.max() - movie.foreign_gross.min
```

```
domestic gross :  936699900.0
 Foreign gross :  960499400.0
```

In [60]:
```
#determining the standard deviation
print("Standard deviation for Domestic gross is : ", movie.domestic_gross.std(
print("Standard deciation for foreign gross is : ", movie.foreign_gross.std())
```

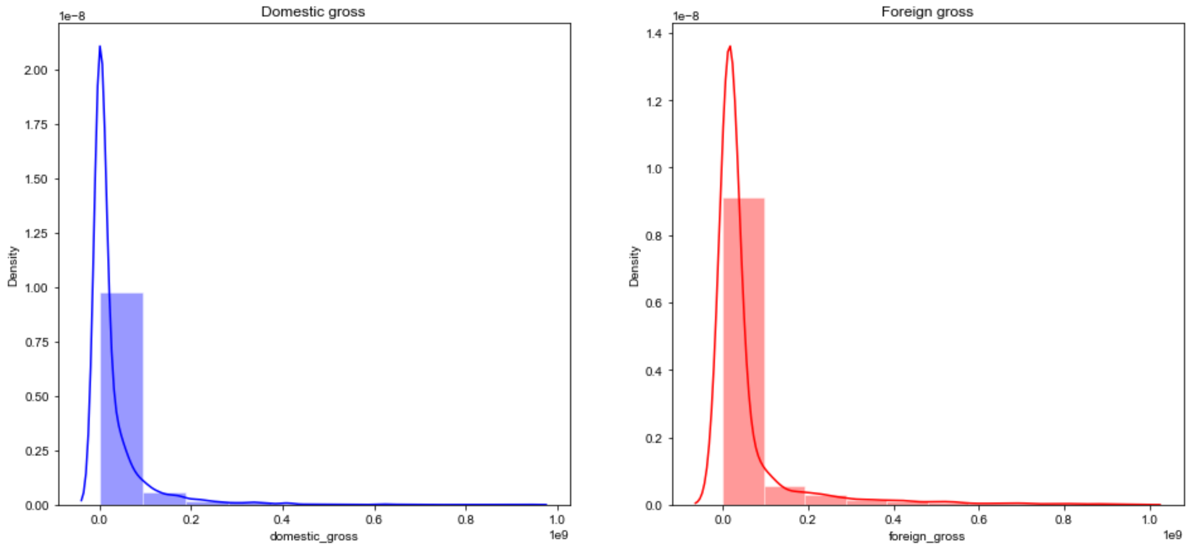
```
Standard deviation for Domestic gross is :  66791614.601031914
Standard deciation for foreign gross is :  110074384.71875076
```

In [61]:
```
#determing variance
print("Variance for domestic gross is : ", movie.domestic_gross.var())
print("Variance for foreign gross is : ", movie.foreign_gross.var())
```

```
Variance for domestic gross is :  4461119781012780.0
Variance for foreign gross is :  1.211637017121155e+16
```

In [62]:
```
#plotting a histogram
fig, (ax1, ax2)= plt.subplots(1, 2, figsize= (16, 7))
sns.set_style("darkgrid")
sns.distplot(movie.domestic_gross, ax=ax1, color="blue", bins= 10)
sns.distplot(movie.foreign_gross, ax=ax2, color="red", bins=10)
ax1.set_title("Domestic gross")
ax2.set_title("Foreign gross")
plt.show();
```

```
c:\Users\Brian\anaconda3\New folder\envs\learn-env\lib\site-packages\seaborn
\distributions.py:2551: FutureWarning: `distplot` is a deprecated function an
d will be removed in a future version. Please adapt your code to use either `
displot` (a figure-level function with similar flexibility) or `histplot` (an
axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
c:\Users\Brian\anaconda3\New folder\envs\learn-env\lib\site-packages\seaborn
\distributions.py:2551: FutureWarning: `distplot` is a deprecated function an
d will be removed in a future version. Please adapt your code to use either `
displot` (a figure-level function with similar flexibility) or `histplot` (an
axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```



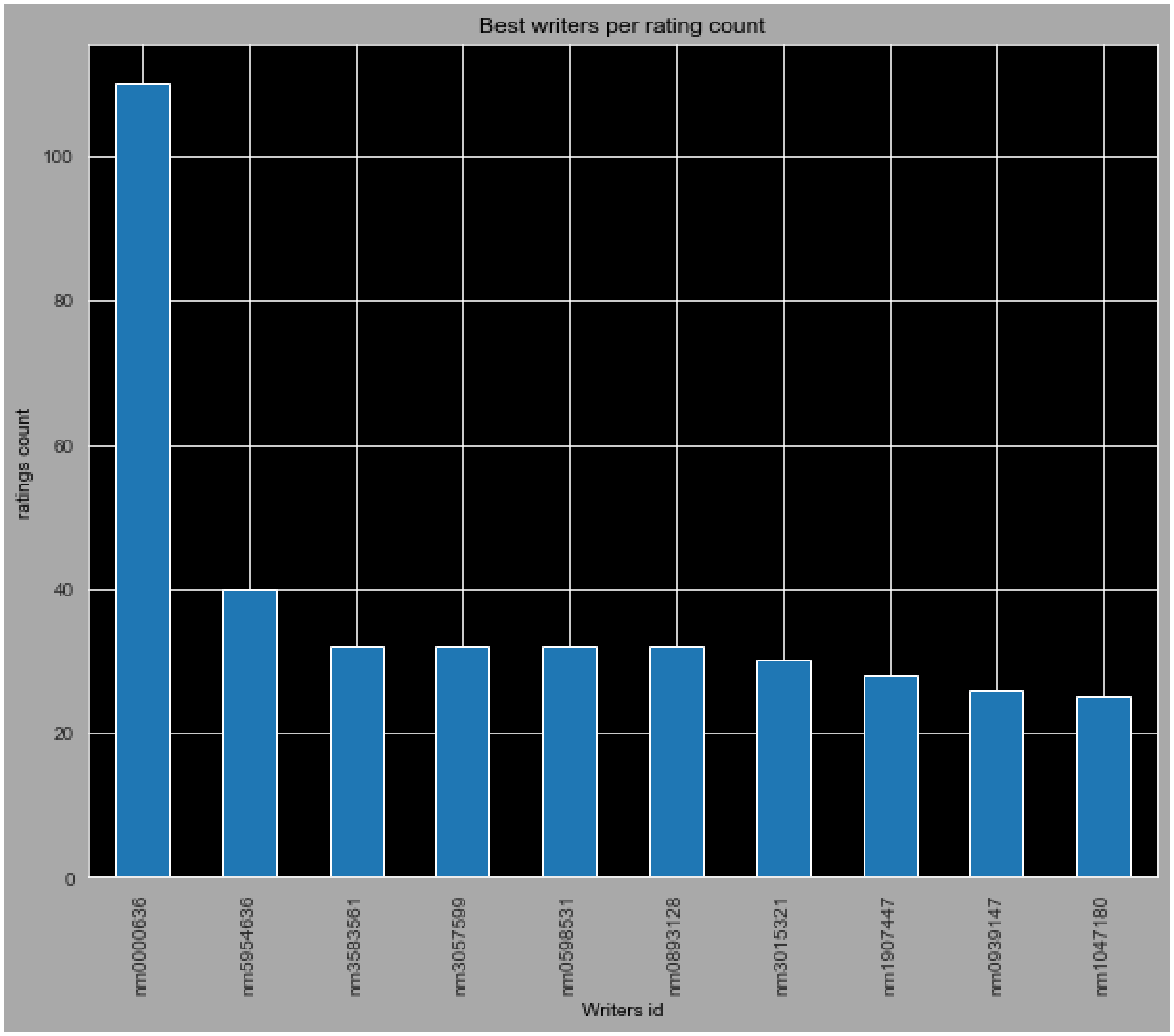
Data analysis for movie_rating_writers

In [63]:
```
movie_rating_writers.head()
```

Out[63]:

	movie_id	average_rating	numvotes	person_id
0	tt10356526	8.3	31	nm3057599
1	tt10356526	8.3	31	nm4179342
2	tt1042974	6.4	20	nm1915232
3	tt1043726	4.2	50352	nm0001317
4	tt1043726	4.2	50352	nm0316417

In [64]:
```
fig,ax= plt.subplots(figsize= (10, 8))
movie_rating_writers.person_id.value_counts().head(10).plot.bar()
plt.xlabel("Writers id", color="black")
plt.ylabel("ratings count", color="black")
plt.title("Best writers per rating count", color="black")
ax.set_facecolor("black")
fig.patch.set_facecolor("darkgrey")
plt.show()
```



In [65]:
```
movie_rating_writers.person_id.value_counts()
```

Out[65]:
```
nm0000636    110
nm5954636     40
nm3583561     32
nm3057599     32
nm0598531     32
            ...
nm0602358      1
nm2952132      1
nm2078049      1
nm4411428      1
nm3908057      1
Name: person_id, Length: 76243, dtype: int64
```

In [66]:
```
#finding mean of ratings
print("The average rating of movies is : ", mean(movie_rating_writers.average_
```

```
The average rating of movies is :  6.200205628866582
```

In [67]:
```
#finding correlation between columns
movie_rating_writers.person_id.corr(movie_rating_writers.average_rating, metho
```

Out[67]:
```
0.07168746933114539
```

Data analysis for the movie_basics_rating

In [68]:
```
movie_basics_rating.head()
```

Out[68]:

	movie_id	average_rating	numvotes	primary_title	original_title	start_year	runtime_minutes
0	tt10356526	8.3	31	Laiye Je Yaarian	Laiye Je Yaarian	2019	117.0
1	tt10384606	8.9	559	Borderless	Borderless	2019	87.0
2	tt1042974	6.4	20	Just Inès	Just Inès	2010	90.0
3	tt1043726	4.2	50352	The Legend of Hercules	The Legend of Hercules	2014	99.0
4	tt1060240	6.5	21	Até Onde?	Até Onde?	2011	73.0

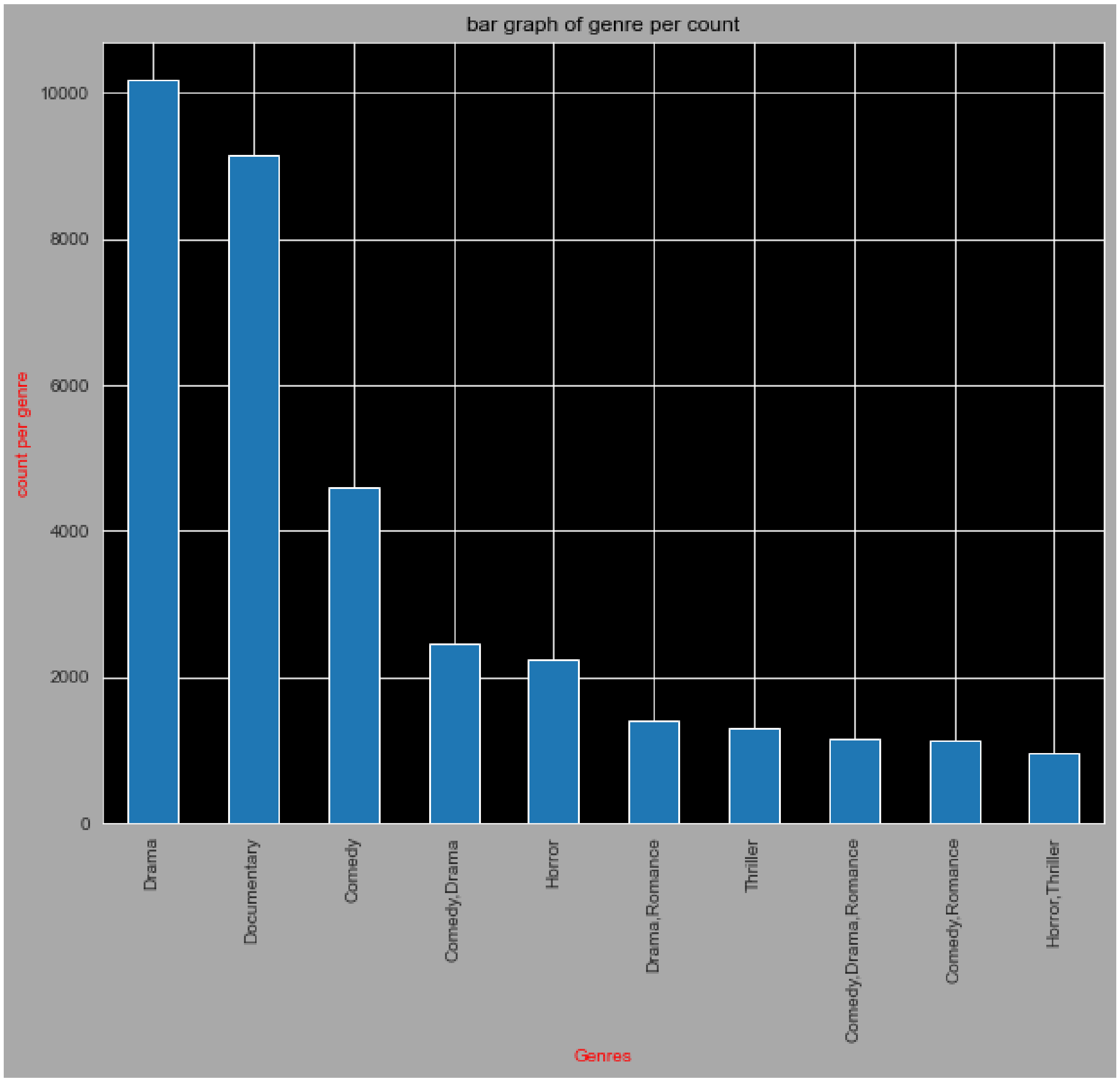
In [69]:
```
#finding number of genres
movie_basics_rating.genres.value_counts().head()
```

Out[69]:
```
Drama           10189
Documentary      9149
Comedy           4604
Comedy,Drama     2451
Horror           2232
Name: genres, dtype: int64
```

In [70]:
```
movie_basics_rating.runtime_minutes.value_counts().head()
```

Out[70]:
```
90.0     4742
80.0     2166
85.0     2057
100.0    1957
95.0     1933
Name: runtime_minutes, dtype: int64
```

In [71]:
```
#barchart for genre of movies
fig, ax= plt.subplots(figsize= (10, 8))
movie_basics_rating.genres.value_counts().head(10).plot.bar()
plt.xlabel("Genres", color="red")
plt.ylabel("count per genre", color="red")
plt.title("bar graph of genre per count", color="black")
ax.set_facecolor("black")
fig.patch.set_facecolor("darkgrey")
plt.show()
```



In [72]:
```
#correlation between columns
movie_basics_rating.genres.corr(movie_basics_rating.average_rating, method="sp
```

Out[72]:
```
-0.06043194510496815
```

In [73]:
```
movie_basics_rating.genres.corr(movie_basics_rating.runtime_minutes, method="s
```

Out[73]:
```
-0.043908603906984915
```

In [74]:
```
movie_basics_rating.average_rating.corr(movie_basics_rating.numvotes, method="
```
Out[74]:
```
-0.24650998938756116
```

RECOMMENDATIONS

1. Microsoft should focus on producing drama, documentary or comedy movie genre as they are the most popular genres
2. Microsoft should research more on IFC to learn more on how they produce, edit and market their movies
3. Microsoft should seek the services of Writer coded NM0000636 as he is the top ranking writer in ratings and movie produced

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