code

May 28, 2023

Final Project Submission

Please fill out:

Student name: Paul Gitonga Njoki

Student pace: full time:

Scheduled project review date/time:

Instructor name:

Blog post URL:

BEST PERFORMING MOVIE ANALYSIS

Authored by Paul Gitonga Njoki

Overview

Microsoft as a company wants to start on creating original video content but do not have enough knowledge about movie creation to move forward with their plan. Using data obtained from the Box Office Mojo, Rotten Tomatoes and TheMovieDB for analysis, it helped in discovering patterns and relationships in the data in order to make better decisions and recommendations that Microsoft will use in order for them to venture into movie crteation.

DATA UNDERSTANDING

Data that is used for this task was obtained from movie websites. I chose to work with two data sets that is the Rotten Tomatoes and Box Office Mojo datasets. After importing the necessary libraries to be used, we then read the data and understand its structrute,data contained and cleaning it before we go ahead to analyzing them to give us efficient information about movies before making conclusions.

[ ]:
```
#loading Libraries
import pandas as pd
import numpy as np

import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
```

```
from scipy import stats
from scipy.stats import norm
```

Rotten Tomatoes Data

```
[ ]: #reading ROTTEN TOMATOES data from the tsv file
rtmovie_df = pd.read_csv("C:/Users/hp/Documents/Moringa_project_phase_1/
↪phase_1_project/learn-co-curriculum dsc-phase-1-project master zippedData/rt.
↪movie_info.tsv.gz", sep='\t', header=0)
rtmovie_df.head()
```

```
[ ]:    id                                          synopsis rating  \
0   1  This gritty, fast-paced, and innovative police…      R
1   3  New York City, not-too-distant-future: Eric Pa…      R
2   5  Illeana Douglas delivers a superb performance …      R
3   6  Michael Douglas runs afoul of a treacherous su…      R
4   7                                                NaN     NR

                                   genre          director  \
0  Action and Adventure|Classics|Drama  William Friedkin
1     Drama|Science Fiction and Fantasy  David Cronenberg
2     Drama|Musical and Performing Arts    Allison Anders
3            Drama|Mystery and Suspense    Barry Levinson
4                          Drama|Romance    Rodney Bennett

                          writer  theater_date      dvd_date currency  \
0                 Ernest Tidyman   Oct 9, 1971  Sep 25, 2001      NaN
1     David Cronenberg|Don DeLillo  Aug 17, 2012   Jan 1, 2013        $
2                 Allison Anders  Sep 13, 1996  Apr 18, 2000      NaN
3  Paul Attanasio|Michael Crichton   Dec 9, 1994  Aug 27, 1997      NaN
4                   Giles Cooper           NaN           NaN      NaN

  box_office      runtime             studio
0        NaN  104 minutes                NaN
1    600,000  108 minutes  Entertainment One
2        NaN  116 minutes                NaN
3        NaN  128 minutes                NaN
4        NaN  200 minutes                NaN
```

```
[ ]: #dropping unwanted columns
rtmovie_df = rtmovie_df.drop(rtmovie_df.columns[0], axis='columns')
```

```
[ ]: rtmovie_df.shape
```

```
[ ]: (1560, 11)
```

```
[ ]: #checking the columns in the dataframe
```

```
rtmovie_df.columns
```

```
[ ]: Index(['synopsis', 'rating', 'genre', 'director', 'writer', 'theater_date',
            'dvd_date', 'currency', 'box_office', 'runtime', 'studio'],
           dtype='object')
```

```
[ ]: #getting the summary of rotten tomatoes dataframe

     rtmovie_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1560 entries, 0 to 1559
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   synopsis      1498 non-null   object
 1   rating        1557 non-null   object
 2   genre         1552 non-null   object
 3   director      1361 non-null   object
 4   writer        1111 non-null   object
 5   theater_date  1201 non-null   object
 6   dvd_date      1201 non-null   object
 7   currency      340 non-null    object
 8   box_office    340 non-null    object
 9   runtime       1530 non-null   object
 10  studio        494 non-null    object
dtypes: object(11)
memory usage: 134.2+ KB
```

```
[ ]: # Checking for null values

     rtmovie_df.isnull().sum()
```

```
[ ]: synopsis          62
     rating             3
     genre              8
     director         199
     writer           449
     theater_date     359
     dvd_date         359
     currency        1220
     box_office      1220
     runtime           30
     studio          1066
     dtype: int64
```

```
[ ]: # obtaining counts for each value in genre column#
```

```
rtmovie_df['genre'].value_counts()
```

```
[ ]: genre
     Drama
     151
     Comedy
     110
     Comedy|Drama
     80
     Drama|Mystery and Suspense
     67
     Art House and International|Drama
     62
              …
     Art House and International|Drama|Sports and Fitness
     1
     Comedy|Documentary|Musical and Performing Arts|Special Interest
     1
     Comedy|Cult Movies|Mystery and Suspense|Science Fiction and Fantasy
     1
     Action and Adventure|Art House and International|Mystery and Suspense|Special
     Interest      1
     Comedy|Drama|Kids and Family|Sports and Fitness
     1
     Name: count, Length: 299, dtype: int64
```

```
[ ]: #obtaing descriptive statistics for the genre column to determine the top genre
     rtmovie_df['genre'].describe()
```

```
[ ]: count      1552
     unique      299
     top       Drama
     freq        151
     Name: genre, dtype: object
```

Data for Box Office Mojo

```
[ ]: #calling the box office mojo data from the  csv file
     #checking the first 5 elements of the dataframe

     mojo_df = pd.read_csv("learn-co-curriculum dsc-phase-1-project master␣
      ↪zippedData/bom.movie_gross.csv.gz")
     mojo_df.head()
```

```
[ ]:                                          title studio  domestic_gross
     0                                  Toy Story 3     BV     415000000.0  \
     1                   Alice in Wonderland (2010)     BV     334200000.0
     2  Harry Potter and the Deathly Hallows Part 1     WB     296000000.0
```

```
3                                     Inception     WB     292600000.0
4                           Shrek Forever After   P/DW     238700000.0

  foreign_gross  year
0     652000000  2010
1     691300000  2010
2     664300000  2010
3     535700000  2010
4     513900000  2010
```

[ ]:
```
#obtaining coloumns in the dataframe

mojo_df.columns
```

[ ]:
```
Index(['title', 'studio', 'domestic_gross', 'foreign_gross', 'year'],
dtype='object')
```

[ ]:
```
#obtainning number of columns androws
mojo_df.shape
```

[ ]:
```
(3387, 5)
```

[ ]:
```
#getting data types per column

mojo_df.dtypes
```

[ ]:
```
title              object
studio             object
domestic_gross    float64
foreign_gross      object
year                int64
dtype: object
```

[ ]:
```
# getting total number of NaN values in the dataset

mojo_df.isna().sum()
```

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

[ ]:
```
#checking the summary of the mojo dataframe

mojo_df.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
```

[ ]:
```
# top studios

top10 = mojo_df['studio'].value_counts().head()
top10
```

[ ]:
```
studio
IFC      166
Uni.     147
WB       140
Fox      136
Magn.    136
Name: count, dtype: int64
```

[ ]:
```
type(top10)
```

[ ]:
```
pandas.core.series.Series
```

[ ]:
```
mojo_df.groupby(['studio']).sum()
```

[ ]:
```
                                                   title  domestic_gross  \
studio
3D             Sea Rex 3D: Journey to a Prehistoric World       6100000.0
A23                 Revenge of the Electric CarRed Obsession       164200.0
A24     Spring BreakersThe Bling RingThe Spectacular N…     324194200.0
ADC                     A Royal Night OutAbsolutely Anything       248200.0
AF      BarbaraSister (2012)Caesar Must DieOmarBethleh…      2142900.0
…                                                    …            …
XL                   Storm Surfers 3DJimi: All Is By My Side       458000.0
YFG                              Papa: Hemingway in Cuba      1100000.0
Yash    Band Baaja BaaraatBadmaash CompanyMere Brother…     31631400.0
Zee                                               Rustom      1100000.0
Zeit.   Mid-August LunchVisionLast Train HomeThe TreeB…      5663500.0

                                           foreign_gross   year
studio
```

```
3D                                                   9900000   2010
A23                                                        0   4024
A24     1760000013300000063000000280000002400000210000011…  98754
ADC                                                        0   4032
AF                                             3100000400000  12080
…                                                          …      …
XL                                                         0   4027
YFG                                                        0   2016
Yash    607006440080000000811000000259000000818000003900000  28194
Zee                                                   571000   2016
Zeit.                 8700000460000002100000120000003700000  32206

[257 rows x 4 columns]
```

[ ]:
```
#descriptive statistics for each column

mojo_df['domestic_gross'].describe()
```

[ ]:
```
count    3.359000e+03
mean     2.874585e+07
std      6.698250e+07
min      1.000000e+02
25%      1.200000e+05
50%      1.400000e+06
75%      2.790000e+07
max      9.367000e+08
Name: domestic_gross, dtype: float64
```

[ ]:
```
#checking the years we'll be working with
mojo_df.year.unique()
```

[ ]:
```
array([2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018], dtype=int64)
```

DATA PREPARATION

I prepared the data for analysis by performing data preparation, which included data cleaning, after deciding the preferred data sets to employ.

We will perform the following after data cleaning:

```
1.  Inspect for and remove any unnecessary columns.
2.  Standardization, column renaming, and data type conversion were required. Upper case value
3.  Verify any null values and remove them.
4.  Search for missing values, then take appropriate action.
5.  Check for duplicate values and remove them if necessary.
```

Regarding the BOM Data;

[ ]:
```
#dropping columns in the dataframe that won't be needed during analysis
```

```
mojo_df.drop(['title'], axis=1, inplace=True)
```

[ ]:
```
mojo_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3387 entries, 0 to 3386
Data columns (total 4 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   studio          3382 non-null   object
 1   domestic_gross  3359 non-null   float64
 2   foreign_gross   2037 non-null   object
 3   year            3387 non-null   int64
dtypes: float64(1), int64(1), object(2)
memory usage: 106.0+ KB
```

[ ]:
```
# checking if there are any duplication
mojo_df.duplicated().value_counts()
```

[ ]:
```
False    3376
True       11
Name: count, dtype: int64
```

[ ]:
```
# missing values inspection
row_count = mojo_df.shape[0]
missing_count = row_count - mojo_df.count()
missing_count
```

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

[ ]:
```
# duplicates check
duplicateRows = mojo_df[mojo_df.duplicated()]
duplicateRows.count()
```

[ ]:
```
studio            11
domestic_gross    11
foreign_gross      0
year              11
dtype: int64
```

[ ]:
```
# checking null values

mojo_df.isnull().any()
```

```
[ ]: studio              True
     domestic_gross      True
     foreign_gross       True
     year               False
     dtype: bool
```

```
[ ]: # duplicates check

     mojo_df.duplicated().sum()
```

```
[ ]: 11
```

For Rotten Tomatoes Data:

I started by dropping columns that i will not need in the analysis

```
[ ]: rtmovie_df.columns
```

```
[ ]: Index(['synopsis', 'rating', 'genre', 'director', 'writer', 'theater_date',
            'dvd_date', 'currency', 'box_office', 'runtime', 'studio'],
           dtype='object')
```

```
[ ]: rtmovie_df
```

```
[ ]:                                                 synopsis rating  \
     0     This gritty, fast-paced, and innovative police…      R
     1     New York City, not-too-distant-future: Eric Pa…      R
     2     Illeana Douglas delivers a superb performance …      R
     3     Michael Douglas runs afoul of a treacherous su…      R
     4                                                   NaN     NR
     …                                                   …    …
     1555  Forget terrorists or hijackers -- there's a ha…      R
     1556  The popular Saturday Night Live sketch was exp…     PG
     1557  Based on a novel by Richard Powell, when the l…      G
     1558  The Sandlot is a coming-of-age story about a g…     PG
     1559  Suspended from the force, Paris cop Hubert is …      R

                                                       genre           director  \
     0                 Action and Adventure|Classics|Drama    William Friedkin
     1                    Drama|Science Fiction and Fantasy    David Cronenberg
     2                    Drama|Musical and Performing Arts      Allison Anders
     3                           Drama|Mystery and Suspense      Barry Levinson
     4                                        Drama|Romance      Rodney Bennett
     …                                                   …                  …
     1555   Action and Adventure|Horror|Mystery and Suspense                NaN
     1556                 Comedy|Science Fiction and Fantasy       Steve Barron
     1557  Classics|Comedy|Drama|Musical and Performing Arts     Gordon Douglas
     1558    Comedy|Drama|Kids and Family|Sports and Fitness  David Mickey Evans
     1559  Action and Adventure|Art House and Internation…              NaN
```

```
                                           writer  theater_date
0                                  Ernest Tidyman   Oct 9, 1971  \
1                      David Cronenberg|Don DeLillo  Aug 17, 2012
2                                  Allison Anders  Sep 13, 1996
3                  Paul Attanasio|Michael Crichton   Dec 9, 1994
4                                    Giles Cooper           NaN
…                                               …             …
1555                                          NaN  Aug 18, 2006
1556  Terry Turner|Tom Davis|Dan Aykroyd|Bonnie Turner  Jul 23, 1993
1557                                          NaN   Jan 1, 1962
1558            David Mickey Evans|Robert Gunter   Apr 1, 1993
1559                                   Luc Besson  Sep 27, 2001

          dvd_date currency  box_office      runtime             studio
0     Sep 25, 2001      NaN         NaN  104 minutes                NaN
1      Jan 1, 2013        $     600,000  108 minutes  Entertainment One
2     Apr 18, 2000      NaN         NaN  116 minutes                NaN
3     Aug 27, 1997      NaN         NaN  128 minutes                NaN
4              NaN      NaN         NaN  200 minutes                NaN
…                …        …           …            …                  …
1555   Jan 2, 2007        $  33,886,034  106 minutes    New Line Cinema
1556  Apr 17, 2001      NaN         NaN   88 minutes  Paramount Vantage
1557  May 11, 2004      NaN         NaN  111 minutes                NaN
1558  Jan 29, 2002      NaN         NaN  101 minutes                NaN
1559  Feb 11, 2003      NaN         NaN   94 minutes  Columbia Pictures

[1560 rows x 11 columns]
```

[ ]:
```
#total NaN values in the data set
rtmovie_df.isna().sum()
```

[ ]:
```
synopsis          62
rating             3
genre              8
director         199
writer           449
theater_date     359
dvd_date         359
currency        1220
box_office      1220
runtime           30
studio          1066
dtype: int64
```

[ ]:
```
#missing values check
row_count = rtmovie_df.shape[0]
```

```
missing_count = row_count - rtmovie_df.count()
missing_count
```

```
[ ]: synopsis          62
     rating             3
     genre              8
     director         199
     writer           449
     theater_date     359
     dvd_date         359
     currency        1220
     box_office      1220
     runtime           30
     studio          1066
     dtype: int64
```

Data Analysis

mojo_df Analysis for top 10 studios against their domestic gross

```
[ ]: #sorting the data for top to studios


     mojo_dfagg = mojo_df.groupby(['studio']).agg('sum')
```

```
[ ]: mojo_dfagg = mojo_dfagg.sort_values('domestic_gross', ascending=False).head(10)
     mojo_dfagg
```

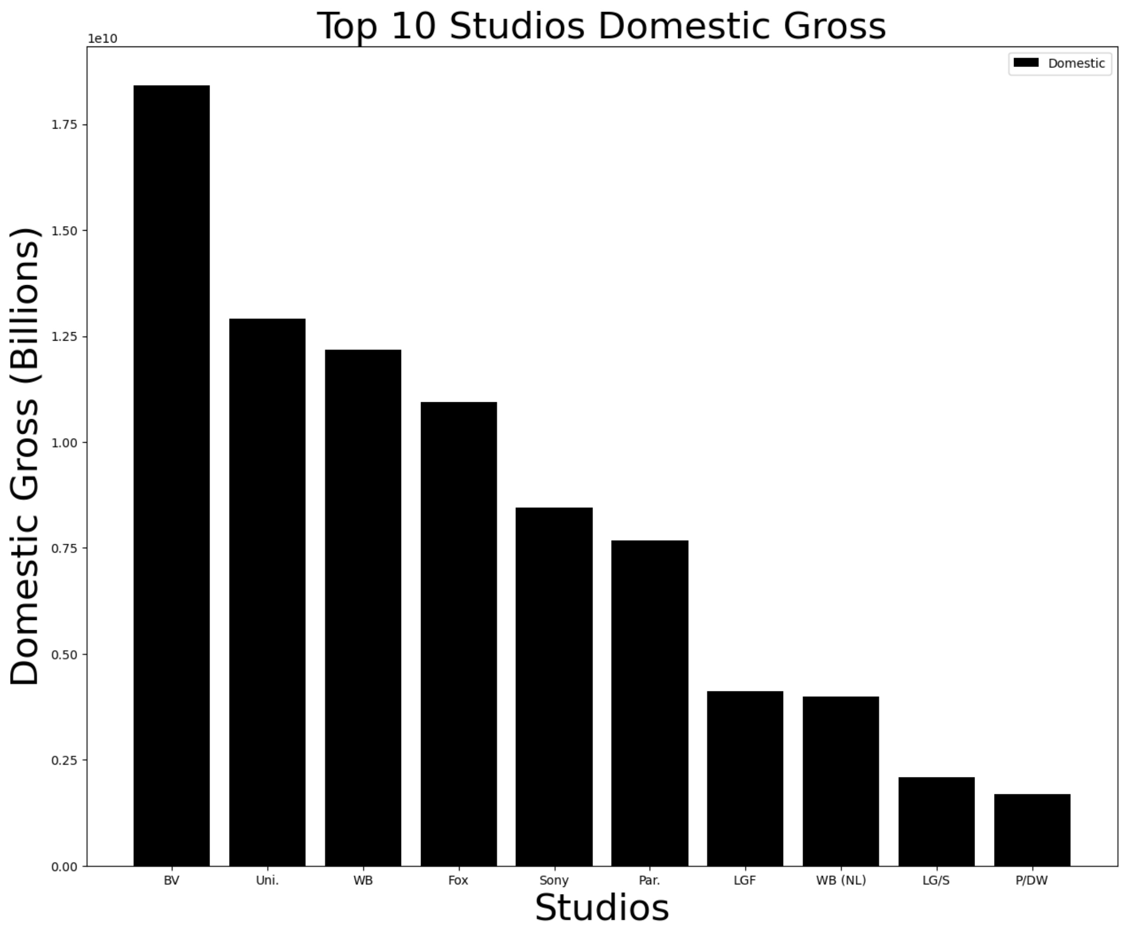
```
[ ]:          domestic_gross                                      foreign_gross
     studio
     BV         1.841903e+10  6520000006913000003910000002280000002456000001…  \
     Uni.       1.290239e+10  291600000216400000162200000077800000059800000642…
     WB         1.216805e+10  6643000005357000003300000001112000001013000006…
     Fox        1.094950e+10  3113000001855000001946000001377000001000000008…
     Sony       8.459683e+09  1825000001752000002107000001094000001280000001…
     Par.       7.685871e+09  311500000187900000166800000081000000092800000545…
     LGF        4.118963e+09  171400000090400000051100000048100000026700000046300…
     WB (NL)    3.995700e+09  1930000001060000000526000000242000000921000001153…
     LG/S       2.078200e+09  5374000001613000001054000000296000000276000000870…
     P/DW       1.682900e+09  513900000277300000173500000013800000077140000050…

                year
     studio
     BV       213451
     Uni.     296082
     WB       281941
     Fox      273882
     Sony     221575
```

```
Par.       203417
LGF        207437
WB (NL)     90644
LG/S        82599
P/DW        20109
```

```
[ ]: mojo_dfagg.index
```

```
[ ]: Index(['BV', 'Uni.', 'WB', 'Fox', 'Sony', 'Par.', 'LGF', 'WB (NL)', 'LG/S',
            'P/DW'],
           dtype='object', name='studio')
```

```
[ ]: #bar graph plot for top 10 studios domestic gross



     plt.figure(figsize=(15,12))

     studios = mojo_dfagg.index
     dom_gross = mojo_dfagg.domestic_gross


     plt.bar(range(len(studios)), dom_gross, color='k')

     plt.title('Top 10 Studios Domestic Gross', fontsize=30)
     plt.xlabel('Studios', fontsize=30)
     plt.ylabel('Domestic Gross (Billions)', fontsize=30)
     plt.xticks(range(len(studios)), studios)

     plt.legend(['Domestic'])
     plt.show();
```



which genre of movie is produced more?

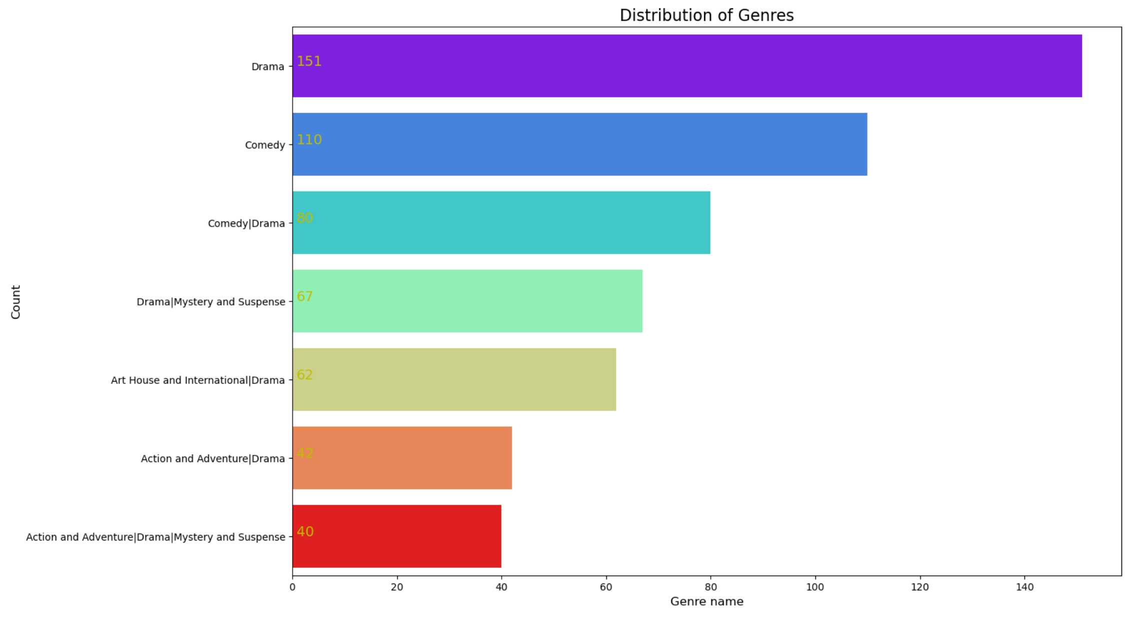
```
[ ]: #as par to rtmovie_df

     rtmovie_df.genre.value_counts()
```

```
[ ]: genre
     Drama
     151
     Comedy
     110
     Comedy|Drama
     80
     Drama|Mystery and Suspense
     67
     Art House and International|Drama
     62
              …
```

```
Art House and International|Drama|Sports and Fitness
1
Comedy|Documentary|Musical and Performing Arts|Special Interest
1
Comedy|Cult Movies|Mystery and Suspense|Science Fiction and Fantasy
1
Action and Adventure|Art House and International|Mystery and Suspense|Special
Interest      1
Comedy|Drama|Kids and Family|Sports and Fitness
1
Name: count, Length: 299, dtype: int64
```

[ ]:
```
#Frequency of movie genres

rtmovie_df['first_genre'] = rtmovie_df['genre'].str.split(',').str[0]

a = plt.cm.cool

plt.figure(figsize=(15,10))
count = rtmovie_df['first_genre'].value_counts()[:7]
sns.barplot(x=count.values,y=count.index, palette=plt.cm.rainbow(np.linspace(0,␣
 ↪1, 7)))
for i, v in enumerate(count.values):
    plt.text(0.8,i,v,color='y',fontsize=14)
plt.xlabel('Genre name', fontsize=12)
plt.ylabel('Count', fontsize=12)
plt.title("Distribution of Genres", fontsize=16)
```

[ ]:
```
Text(0.5, 1.0, 'Distribution of Genres')
```



By looking at the overall amount of films created in each genre, we can observe that drama films are produced more frequently than comedies, with a combination of art house and international|classics|mystery and Suspense being the least frequently produced.

[ ]:
```
#viewing all the unique ratings in the dataframe

rtmovie_df['rating'].unique()
```

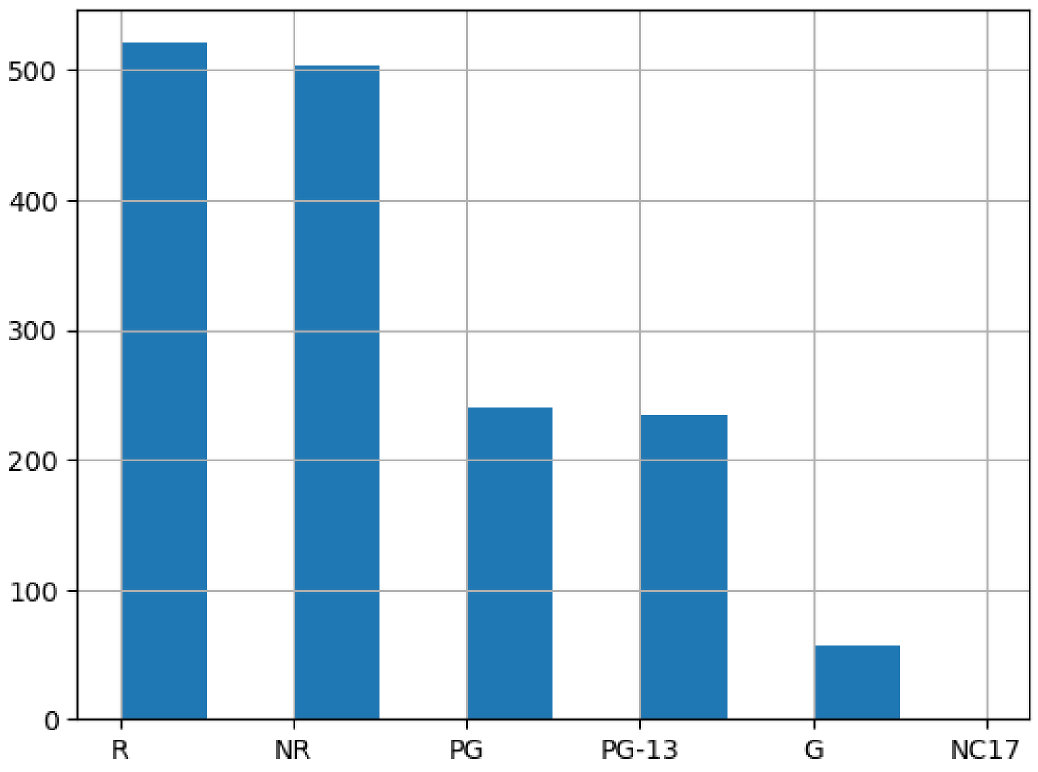
[ ]:
```
array(['R', 'NR', 'PG', 'PG-13', nan, 'G', 'NC17'], dtype=object)
```

[ ]:
```
#checking on the total number of counts per genre:

rtmovie_df['rating'].value_counts()
```

[ ]:
```
rating
R        521
NR       503
PG       240
PG-13    235
G         57
NC17       1
Name: count, dtype: int64
```

[ ]:
```
#visualizing this on a histogram, we'll have

rtmovie_df['rating'].hist(bins=10)
```

[ ]:
```
<Axes: >
```



By evaluating the total number of films under each category, we deduce that films with a R rating are being produced more frequently than those with an NC17 rating.

```
[ ]: # convert release date column to datetime values
     rtmovie_df['dvd_date'] = pd.to_datetime(rtmovie_df['dvd_date'])
     # create release month column
     rtmovie_df['release_month'] = rtmovie_df['dvd_date'].dt.strftime('%B')
```

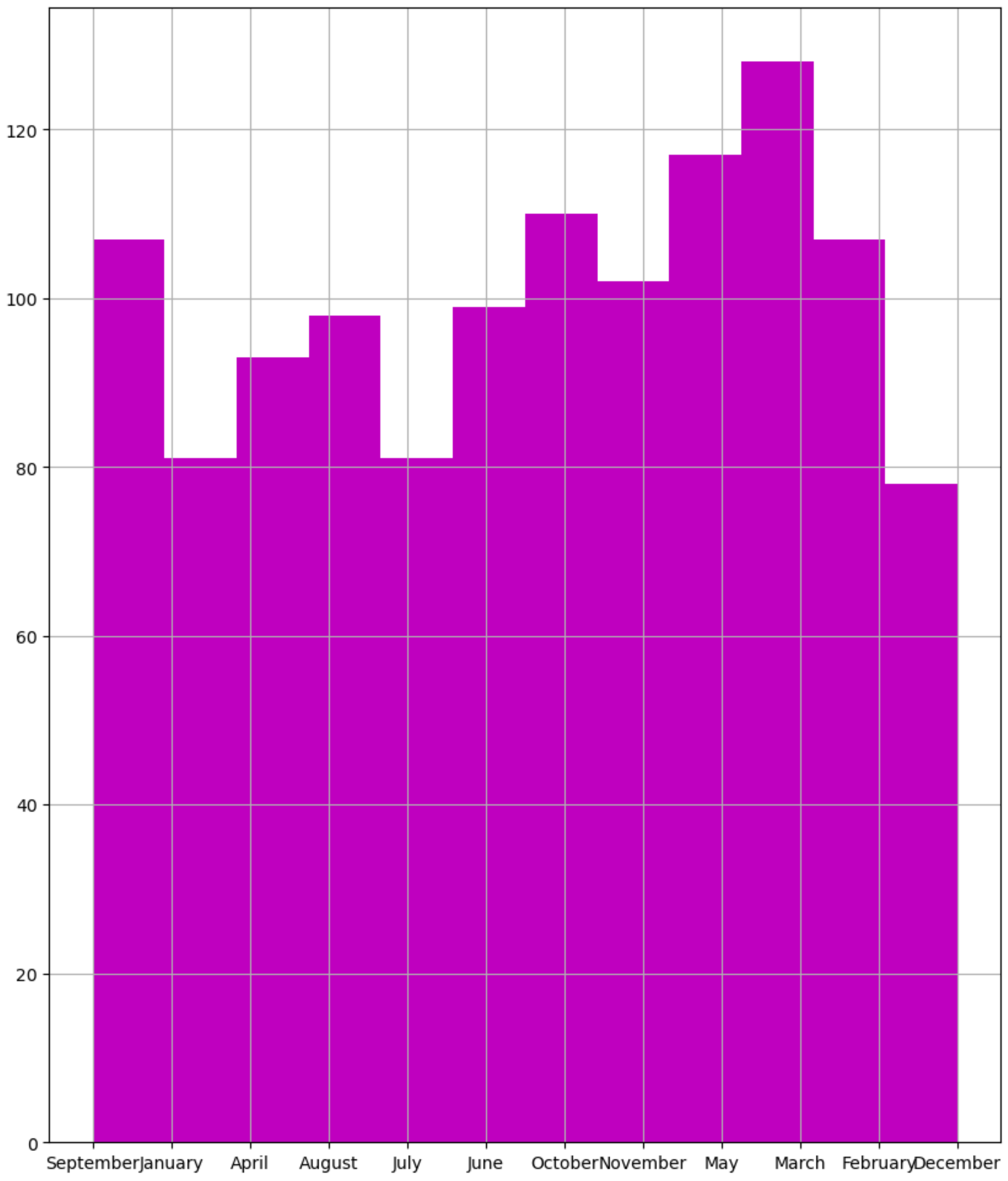
```
[ ]: # checking for successful column creation
     rtmovie_df['release_month'].value_counts()
```

```
[ ]: release_month
     March        128
     May          117
     October      110
     September    107
     February     107
     November     102
     June          99
     August        98
     April         93
     January       81
```

```
July           81
December       78
Name: count, dtype: int64
```

[ ]:
```
#visualizing this on a histogram, we'll have

rtmovie_df['release_month'].hist(bins=12, figsize=(10,12), color=('m'))
```

[ ]:
```
<Axes: >
```



```
[ ]: ##Assesing df
     rtmovie_df
```

```
[ ]:                                                 synopsis rating  \
     0     This gritty, fast-paced, and innovative police…      R
     1     New York City, not-too-distant-future: Eric Pa…      R
     2     Illeana Douglas delivers a superb performance …      R
     3     Michael Douglas runs afoul of a treacherous su…      R
     4                                                   NaN     NR
     …                                                   …    …
     1555  Forget terrorists or hijackers -- there's a ha…      R
     1556  The popular Saturday Night Live sketch was exp…     PG
     1557  Based on a novel by Richard Powell, when the l…      G
     1558  The Sandlot is a coming-of-age story about a g…     PG
     1559  Suspended from the force, Paris cop Hubert is …      R

                                                       genre           director  \
     0                  Action and Adventure|Classics|Drama    William Friedkin
     1                     Drama|Science Fiction and Fantasy    David Cronenberg
     2                     Drama|Musical and Performing Arts      Allison Anders
     3                            Drama|Mystery and Suspense      Barry Levinson
     4                                         Drama|Romance      Rodney Bennett
     …                                                   …                 …
     1555   Action and Adventure|Horror|Mystery and Suspense                 NaN
     1556                Comedy|Science Fiction and Fantasy        Steve Barron
     1557  Classics|Comedy|Drama|Musical and Performing Arts      Gordon Douglas
     1558    Comedy|Drama|Kids and Family|Sports and Fitness  David Mickey Evans
     1559  Action and Adventure|Art House and Internation…                 NaN

                                                  writer  theater_date  \
     0                                    Ernest Tidyman   Oct 9, 1971
     1                       David Cronenberg|Don DeLillo  Aug 17, 2012
     2                                    Allison Anders  Sep 13, 1996
     3                    Paul Attanasio|Michael Crichton   Dec 9, 1994
     4                                      Giles Cooper           NaN
     …                                                 …           …
     1555                                              NaN  Aug 18, 2006
     1556  Terry Turner|Tom Davis|Dan Aykroyd|Bonnie Turner  Jul 23, 1993
     1557                                              NaN   Jan 1, 1962
     1558                     David Mickey Evans|Robert Gunter   Apr 1, 1993
     1559                                       Luc Besson  Sep 27, 2001

          dvd_date currency  box_office      runtime           studio
     0    2001-09-25      NaN         NaN  104 minutes              NaN  \
     1    2013-01-01        $     600,000  108 minutes  Entertainment One
```

```
2    2000-04-18      NaN          NaN  116 minutes                 NaN
3    1997-08-27      NaN          NaN  128 minutes                 NaN
4           NaT      NaN          NaN  200 minutes                 NaN
…           …     …        …           …             …
1555 2007-01-02        $  33,886,034  106 minutes    New Line Cinema
1556 2001-04-17      NaN          NaN   88 minutes  Paramount Vantage
1557 2004-05-11      NaN          NaN  111 minutes                 NaN
1558 2002-01-29      NaN          NaN  101 minutes                 NaN
1559 2003-02-11      NaN          NaN   94 minutes  Columbia Pictures

                                            first_genre release_month
0                     Action and Adventure|Classics|Drama     September
1                       Drama|Science Fiction and Fantasy       January
2                       Drama|Musical and Performing Arts         April
3                              Drama|Mystery and Suspense        August
4                                           Drama|Romance           NaN
…                                                     …           …
1555   Action and Adventure|Horror|Mystery and Suspense       January
1556                     Comedy|Science Fiction and Fantasy         April
1557  Classics|Comedy|Drama|Musical and Performing Arts           May
1558    Comedy|Drama|Kids and Family|Sports and Fitness       January
1559  Action and Adventure|Art House and Internation…      February

[1560 rows x 13 columns]
```

merging BOM data and Rotten Tomatoes dataframes

```
[ ]: # merging the Dfs
     merged_df = pd.merge(rtmovie_df, mojo_df, how='outer')
     # previewing the new DataFrame
     merged_df.shape
```

```
[ ]: (9213, 16)
```

```
[ ]: merged_df.head()
```

```
[ ]:                                            synopsis rating  
     0  This gritty, fast-paced, and innovative police…      R   \
     1  This gritty, fast-paced, and innovative police…      R
     2  This gritty, fast-paced, and innovative police…      R
     3  This gritty, fast-paced, and innovative police…      R
     4  This gritty, fast-paced, and innovative police…      R

                                     genre         director          writer  
     0  Action and Adventure|Classics|Drama  William Friedkin  Ernest Tidyman  \
     1  Action and Adventure|Classics|Drama  William Friedkin  Ernest Tidyman
     2  Action and Adventure|Classics|Drama  William Friedkin  Ernest Tidyman
     3  Action and Adventure|Classics|Drama  William Friedkin  Ernest Tidyman
```

```
4  Action and Adventure|Classics|Drama  William Friedkin  Ernest Tidyman

  theater_date   dvd_date currency box_office      runtime studio
0  Oct 9, 1971 2001-09-25      NaN        NaN  104 minutes    NaN  \
1  Oct 9, 1971 2001-09-25      NaN        NaN  104 minutes    NaN
2  Oct 9, 1971 2001-09-25      NaN        NaN  104 minutes    NaN
3  Oct 9, 1971 2001-09-25      NaN        NaN  104 minutes    NaN
4  Oct 9, 1971 2001-09-25      NaN        NaN  104 minutes    NaN

                           first_genre release_month  domestic_gross
0  Action and Adventure|Classics|Drama     September         96900.0  \
1  Action and Adventure|Classics|Drama     September         70600.0
2  Action and Adventure|Classics|Drama     September             NaN
3  Action and Adventure|Classics|Drama     September          7100.0
4  Action and Adventure|Classics|Drama     September             NaN

  foreign_gross    year
0       3300000  2010.0
1       3300000  2011.0
2       4000000  2012.0
3           NaN  2014.0
4     122000000  2017.0
```

[ ]:
```
# show number of rows and columns
merged_df.shape
```

[ ]:
```
(9213, 16)
```

[ ]:
```
# show all column names
merged_df.columns
```

[ ]:
```
Index(['synopsis', 'rating', 'genre', 'director', 'writer', 'theater_date',
       'dvd_date', 'currency', 'box_office', 'runtime', 'studio',
       'first_genre', 'release_month', 'domestic_gross', 'foreign_gross',
       'year'],
      dtype='object')
```

[ ]:
```
 #counts per genre of the merged dataframe

count = merged_df['genre'].value_counts()
count
```

[ ]:
```
genre
Drama|Mystery and Suspense
531
Drama
489
```

```
Comedy|Drama
421
Comedy
338
Art House and International|Drama
274
                              …
Action and Adventure|Animation|Science Fiction and Fantasy
1
Action and Adventure|Animation|Drama|Science Fiction and Fantasy|Special
Interest                  1
Kids and Family|Musical and Performing Arts
1
Action and Adventure|Animation|Art House and International|Drama|Science Fiction
and Fantasy       1
Art House and International|Documentary|Faith and Spirituality
1
Name: count, Length: 299, dtype: int64
```

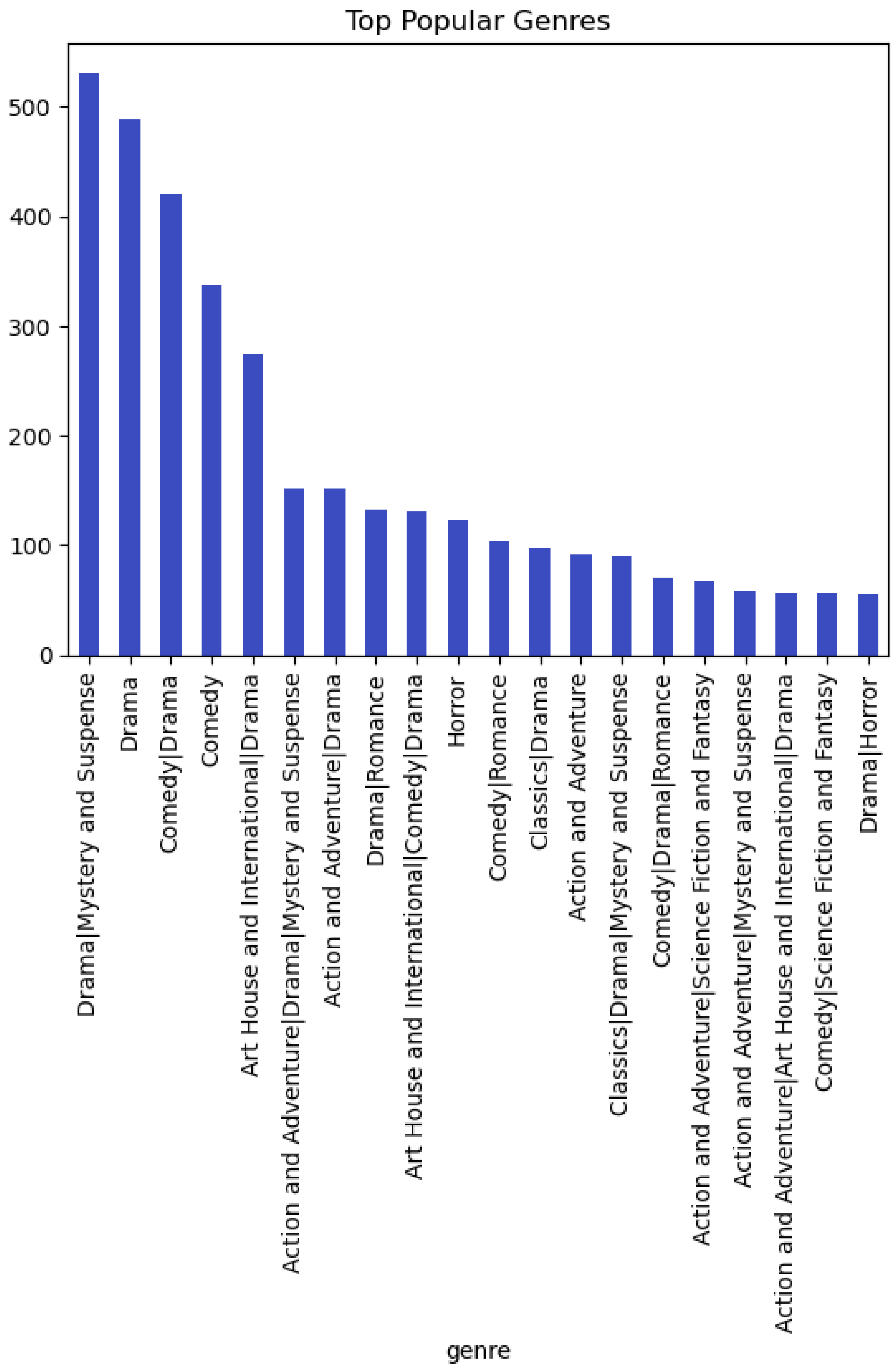
[ ]:
```
pop_genres = count.iloc[:20]
pop_genres
```

[ ]:
```
genre
Drama|Mystery and Suspense                                  531
Drama                                                       489
Comedy|Drama                                                421
Comedy                                                      338
Art House and International|Drama                           274
Action and Adventure|Drama|Mystery and Suspense             152
Action and Adventure|Drama                                  152
Drama|Romance                                               133
Art House and International|Comedy|Drama                    131
Horror                                                      123
Comedy|Romance                                              104
Classics|Drama                                               97
Action and Adventure                                         91
Classics|Drama|Mystery and Suspense                          90
Comedy|Drama|Romance                                         71
Action and Adventure|Science Fiction and Fantasy             68
Action and Adventure|Mystery and Suspense                    58
Action and Adventure|Art House and International|Drama       57
Comedy|Science Fiction and Fantasy                           57
Drama|Horror                                                 55
Name: count, dtype: int64
```

[ ]:
```
#top 20 popular movies that is with the most value counts represented in a␣
↪graph:
```

```
pop_genres.plot.bar(x = 'genres', title = 'Top Popular Genres',␣
 ↪colormap='coolwarm')
```

```
[ ]: <Axes: title={'center': 'Top Popular Genres'}, xlabel='genre'>
```


Top Popular Genres
500
400
300
200
100
0
Drama|Mystery and Suspense
Drama
Comedy|Drama
Comedy
Art House and International|Drama
Action and Adventure|Drama|Mystery and Suspense
Action and Adventure|Drama
Drama|Romance
Art House and International|Comedy|Drama
Horror
Comedy|Romance
Classics|Drama
Action and Adventure
Classics|Drama|Mystery and Suspense
Comedy|Drama|Romance
Action and Adventure|Science Fiction and Fantasy
Action and Adventure|Mystery and Suspense
Action and Adventure|Art House and International|Drama
Comedy|Science Fiction and Fantasy
Drama|Horror
genre

```
[ ]: # getting mean and median world domestic amounts by genre

     genre_stats = merged_df.groupby('genre')['domestic_gross'].agg(['median',␣
      ↪'mean'])
     genre_stats.sort_values(by='mean', ascending=False)
```

```
[ ]:                                                         median          mean
     genre
     Drama|Mystery and Suspense                           30350000.0  5.553751e+07
     Art House and International|Comedy|Drama|Musica…  17048450.0  3.336243e+07
     Drama|Horror|Mystery and Suspense                       70600.0  8.384258e+06
     Action and Adventure|Mystery and Suspense               70600.0  6.719047e+06
     Drama|Horror                                          1500000.0  6.237862e+06
     …                                                          …             …
     Horror|Kids and Family|Mystery and Suspense|Sci…         NaN           NaN
     Horror|Musical and Performing Arts|Science Fict…         NaN           NaN
     Horror|Mystery and Suspense|Science Fiction and…         NaN           NaN
     Kids and Family|Musical and Performing Arts                NaN           NaN
     Mystery and Suspense|Science Fiction and Fantas…         NaN           NaN

     [299 rows x 2 columns]
```

```
[ ]: #filtering the dataframe based on Drama|Mystery and Suspense which is the top␣
      ↪genre

     DramaMS=merged_df.loc[merged_df['genre'] == "Drama|Mystery and Suspense"]
     DramaMS
```

```
[ ]:                                                synopsis rating
     10    Michael Douglas runs afoul of a treacherous su…      R  \
     11    Michael Douglas runs afoul of a treacherous su…      R
     12    Michael Douglas runs afoul of a treacherous su…      R
     13    Michael Douglas runs afoul of a treacherous su…      R
     14    Michael Douglas runs afoul of a treacherous su…      R
     …                                                   …    …
     5968  Directed by Clint Eastwood, the mysterious dra…      R
     6002  Abel Ferrara's cult crime drama Bad Lieutenant…      R
     6212  Filmed in the California desert on Super 16mm,…     NR
     6285  Frankie is a Los Angeles drug dealer. He comes…      R
     6303  Texas brothers--Toby (Chris Pine), and Tanner …      R

                                genre         director
     10    Drama|Mystery and Suspense   Barry Levinson  \
     11    Drama|Mystery and Suspense   Barry Levinson
     12    Drama|Mystery and Suspense   Barry Levinson
     13    Drama|Mystery and Suspense   Barry Levinson
     14    Drama|Mystery and Suspense   Barry Levinson
```

```
…                            …          …
5968  Drama|Mystery and Suspense   Clint Eastwood
6002  Drama|Mystery and Suspense    Werner Herzog
6212  Drama|Mystery and Suspense        Oren Shai
6285  Drama|Mystery and Suspense  Nick Cassavetes
6303  Drama|Mystery and Suspense  David Mackenzie

                              writer  theater_date   dvd_date currency
10    Paul Attanasio|Michael Crichton   Dec 9, 1994 1997-08-27      NaN  \
11    Paul Attanasio|Michael Crichton   Dec 9, 1994 1997-08-27      NaN
12    Paul Attanasio|Michael Crichton   Dec 9, 1994 1997-08-27      NaN
13    Paul Attanasio|Michael Crichton   Dec 9, 1994 1997-08-27      NaN
14    Paul Attanasio|Michael Crichton   Dec 9, 1994 1997-08-27      NaN
…                                 …           …          …       …
5968                  Brian Helgeland   Oct 8, 2003 2004-06-08        $
6002                              NaN  Nov 20, 2009 2010-04-06        $
6212           Oren Shai|Webb Wilcoxen  Oct 28, 2016 2016-12-06      NaN
6285                  Nick Cassavetes  Jan 12, 2007 2007-05-01        $
6303                  Taylor Sheridan  Aug 12, 2016 2016-11-22        $

      box_office      runtime              studio
10           NaN  128 minutes                 NaN  \
11           NaN  128 minutes                 NaN
12           NaN  128 minutes                 NaN
13           NaN  128 minutes                 NaN
14           NaN  128 minutes                 NaN
…          …          …                  …
5968  88,800,000  137 minutes                  WB
6002   1,616,556  121 minutes  First Look Pictures
6212         NaN   88 minutes        Rocking Films
6285  15,133,185  118 minutes    Universal Studios
6303  26,973,524  102 minutes             Film 44

                     first_genre release_month  domestic_gross foreign_gross
10    Drama|Mystery and Suspense        August         96900.0       3300000  \
11    Drama|Mystery and Suspense        August         70600.0       3300000
12    Drama|Mystery and Suspense        August             NaN       4000000
13    Drama|Mystery and Suspense        August          7100.0           NaN
14    Drama|Mystery and Suspense        August             NaN     122000000
…                            …           …              …            …
5968  Drama|Mystery and Suspense          June       3200000.0           NaN
6002  Drama|Mystery and Suspense         April             NaN           NaN
6212  Drama|Mystery and Suspense      December             NaN           NaN
6285  Drama|Mystery and Suspense           May             NaN           NaN
6303  Drama|Mystery and Suspense      November             NaN           NaN

        year
```

```
10    2010.0
11    2011.0
12    2012.0
13    2014.0
14    2017.0
…       …
5968  2018.0
6002     NaN
6212     NaN
6285     NaN
6303     NaN

[531 rows x 16 columns]
```

[ ]:
```
#filtering out the most common director in the Drama|Mystery and Suspense genre

DramaMS['director'].value_counts()
```

[ ]:
```
director
Clint Eastwood                      141
Gary Wheeler                        136
Joseph Ruben                         10
Gary Fleder                           6
Mike Figgis                           6
Barry Levinson                        5
Lewis Gilbert                         5
John Badham                           5
Curtis Hanson                         5
Shawn Christensen                     5
William Beaudine                      5
Andy Wolk                             5
Andrew Chapman                        5
Bob Rafelson|George Bud Davis         5
Robert Foster                         5
Michael Fields                        5
Andrew Birkin                         5
Spike Lee                             5
Peter Hyams                           5
James Cox                             5
Steven Hilliard Stern                 5
Gordon Willis                         5
Irving Lerner                         5
Fritz Lang                            5
Paul Wendkos                          5
Uli Edel                              5
Nathan Hope                           5
Mike Barker                           5
```

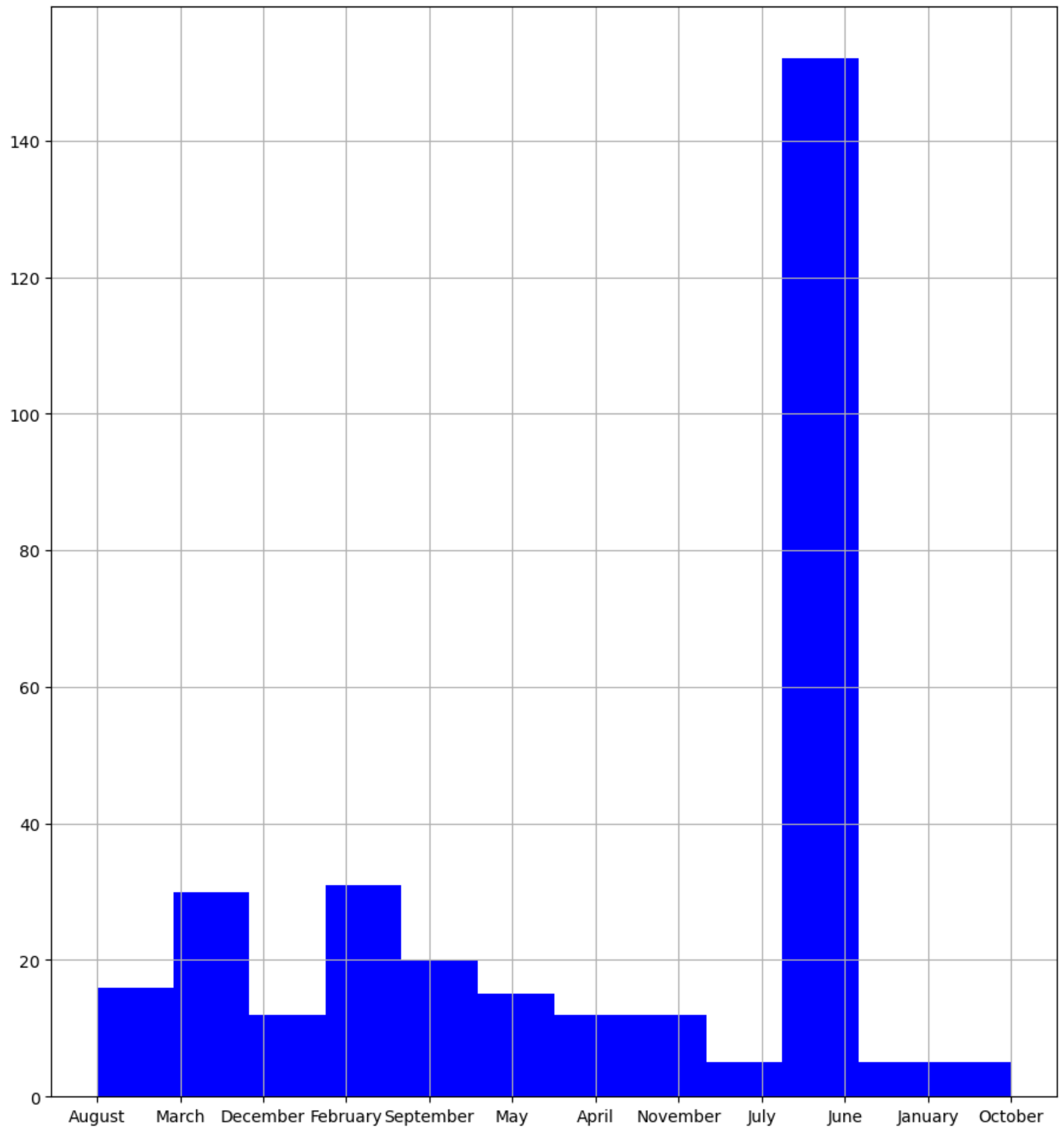
```
Sidney Gilliat                     5
John Sturges                       5
David Mamet                        5
Gordon Hessler                     5
Sam Peckinpah                      5
Boaz Yakin                         5
Yves Simoneau                      5
Neil Jordan                        5
Bruce Robinson                     5
Larry Elikann                      5
Nicolas Roeg                       5
Steven Spielberg                   5
John Farrow                        5
Michael Apted                      5
Bryan Singer                       3
David Koepp                        1
Nick Cassavetes                    1
Oren Shai                          1
Werner Herzog                      1
Anton Corbijn                      1
Will Canon                         1
Nicholas Racz                      1
Perry Moore|Hunter Hill            1
Craig Bolotin                      1
Morten Tyldum                      1
David Fincher                      1
Simon West                         1
Paul Thomas Anderson               1
David Mackenzie                    1
Name: count, dtype: int64
```

```
[ ]: DramaMS['release_month'].value_counts()
```

```
[ ]: release_month
     June         152
     February      31
     March         30
     September     20
     August        16
     May           15
     December      12
     April         12
     November      12
     July           5
     January        5
     October        5
     Name: count, dtype: int64
```

[ ]:
```
# Visualizing MONTH RELEASED using histogram
DramaMS['release_month'].hist(bins=12, figsize=(11,12), color=('blue'))
```

[ ]:
```
<Axes: >
```



Most Drama|Mystery and Suspense movies were released in the month of june

[ ]:
```
DramaMS['rating'].value_counts()
```

[ ]:
```
rating
R         293
```

```
PG-13    152
NR        76
G          5
PG         5
Name: count, dtype: int64
```

```
[ ]:
```