Microsoft Movie Studio Components Analysis

Overview

The project is investigating and analyzing what components are needed to get started in the movie production business. We will be using the top grossing genres domestically, top grossing directors domestically and domestic gross by release month, this will show what genres of film to initially to make, which directors to use and when is a good time to release the film

Data Gathering

Gathering multiple CSV files to create a dictionary where the key is the name of the file and the value is data frame

In [1]:
```
#importing data using glob

import os
from glob import glob
import pandas as pd

csv_files = glob("./zippedData/*.csv.gz")
csv_files

csv_files_dict = {}
for filename in csv_files:
    filename_cleaned = os.path.basename(filename).replace(".csv", "").replace(".", "_")
#cleaning the filenames
    filename_df = pd.read_csv(filename, index_col=0)
    csv_files_dict[filename_cleaned] = filename_df
```

In [2]:
```
csv_files
```

Out[2]:
```
['./zippedData/imdb.title.crew.csv.gz',
 './zippedData/tmdb.movies.csv.gz',
 './zippedData/imdb.title.akas.csv.gz',
 './zippedData/imdb.title.ratings.csv.gz',
 './zippedData/imdb.name.basics.csv.gz',
 './zippedData/imdb.title.basics.csv.gz',
 './zippedData/tn.movie_budgets.csv.gz',
 './zippedData/bom.movie_gross.csv.gz',
 './zippedData/imdb.title.principals.csv.gz']
```

In [3]:
```
csv_files_dict.values()
```

Out[3]:
```
dict_values([                              directors             writers
tconst
tt0285252                       nm0899854           nm0899854
tt0438973                             NaN  nm0175726,nm1802864
tt0462036                       nm1940585           nm1940585
tt0835418                       nm0151540  nm0310087,nm0841532
tt0878654  nm0089502,nm2291498,nm2292011           nm0284943
...                                   ...                 ...
tt8999974                      nm10122357          nm10122357
tt9001390                       nm6711477           nm6711477
tt9001494          nm10123242,nm10123248                 NaN
tt9004986                       nm4993825           nm4993825
tt9010172                             NaN           nm8352242

[146144 rows x 2 columns],                  genre_ids      id original_language  \
0          [12, 14, 10751]   12444                en
1      [14, 12, 16, 10751]   10191                en
2            [12, 28, 878]   10138                en
3          [16, 35, 10751]     862                en
4            [28, 878, 12]   27205                en
...                    ...     ...               ...
26512             [27, 18]  488143                en
26513             [18, 53]  485975                en
26514         [14, 28, 12]  381231                en
26515      [10751, 12, 28]  366854                en
26516             [53, 27]  309885                en

                                    original_title  popularity release_date  \
0      Harry Potter and the Deathly Hallows: Part 1      33.533   2010-11-19
1                          How to Train Your Dragon      28.734   2010-03-26
2                                       Iron Man 2      28.515   2010-05-07
3                                        Toy Story      28.005   1995-11-22
4                                        Inception      27.920   2010-07-16
...                                            ...         ...          ...
26512                      Laboratory Conditions       0.600   2018-10-13
26513                           _EXHIBIT_84xxx_        0.600   2018-05-01
26514                              The Last One        0.600   2018-10-01
26515                              Trailer Made        0.600   2018-06-22
26516                                The Church        0.600   2018-10-05

                                         title  vote_average  vote_count
0      Harry Potter and the Deathly Hallows: Part 1           7.7       10788
1                          How to Train Your Dragon           7.7        7610
2                                       Iron Man 2           6.8       12368
3                                        Toy Story           7.9       10174
4                                        Inception           8.3       22186
```

```
...                                      ...          ...        ...
26512                      Laboratory Conditions          0.0          1
26513                            _EXHIBIT_84xxx_          0.0          1
26514                               The Last One          0.0          1
26515                               Trailer Made          0.0          1
26516                                 The Church          0.0          1

[26517 rows x 9 columns],            ordering                                  title region language  \
title_id
tt0369610        10                          Джурасик свят     BG       bg
tt0369610        11                       Jurashikku warudo     JP      NaN
tt0369610        12  Jurassic World: O Mundo dos Dinossauros     BR      NaN
tt0369610        13                  O Mundo dos Dinossauros     BR      NaN
tt0369610        14                           Jurassic World     FR      NaN
...             ...                                      ...    ...      ...
tt9827784         2                      Sayonara kuchibiru    NaN      NaN
tt9827784         3                           Farewell Song    XWW       en
tt9880178         1                             La atención    NaN      NaN
tt9880178         2                             La atención     ES      NaN
tt9880178         3                          The Attention    XWW       en

                types   attributes  is_original_title
title_id
tt0369610         NaN          NaN                0.0
tt0369610  imdbDisplay          NaN                0.0
tt0369610  imdbDisplay          NaN                0.0
tt0369610         NaN  short title                0.0
tt0369610  imdbDisplay          NaN                0.0
...                ...          ...                ...
tt9827784    original          NaN                1.0
tt9827784  imdbDisplay          NaN                0.0
tt9880178    original          NaN                1.0
tt9880178         NaN          NaN                0.0
tt9880178  imdbDisplay          NaN                0.0

[331703 rows x 7 columns],             averagerating  numvotes
tconst
tt10356526            8.3        31
tt10384606            8.9       559
tt1042974             6.4        20
tt1043726             4.2     50352
tt1060240             6.5        21
...                   ...       ...
tt9805820             8.1        25
tt9844256             7.5        24
tt9851050             4.7        14
tt9886934             7.0         5
tt9894098             6.3       128
```

```
[73856 rows x 2 columns],                  primary_name  birth_year  death_year  \
nconst
nm0061671    Mary Ellen Bauder         NaN         NaN
nm0061865         Joseph Bauer         NaN         NaN
nm0062070           Bruce Baum         NaN         NaN
nm0062195         Axel Baumann         NaN         NaN
nm0062798          Pete Baxter         NaN         NaN
...                        ...         ...         ...
nm9990381         Susan Grobes         NaN         NaN
nm9990690          Joo Yeon So         NaN         NaN
nm9991320       Madeline Smith         NaN         NaN
nm9991786  Michelle Modigliani         NaN         NaN
nm9993380       Pegasus Envoyé         NaN         NaN

                                      primary_profession  \
nconst
nm0061671         miscellaneous,production_manager,producer
nm0061865        composer,music_department,sound_department
nm0062070                       miscellaneous,actor,writer
nm0062195  camera_department,cinematographer,art_department
nm0062798  production_designer,art_department,set_decorator
...                                                    ...
nm9990381                                          actress
nm9990690                                          actress
nm9991320                                          actress
nm9991786                                         producer
nm9993380                            director,actor,writer

                               known_for_titles
nconst
nm0061671  tt0837562,tt2398241,tt0844471,tt0118553
nm0061865  tt0896534,tt6791238,tt0287072,tt1682940
nm0062070  tt1470654,tt0363631,tt0104030,tt0102898
nm0062195  tt0114371,tt2004304,tt1618448,tt1224387
nm0062798  tt0452644,tt0452692,tt3458030,tt2178256
...                                          ...
nm9990381                                    NaN
nm9990690                    tt9090932,tt8737130
nm9991320                    tt8734436,tt9615610
nm9991786                                    NaN
nm9993380                             tt8743182

[606648 rows x 5 columns],                                          primary_title  \
tconst
tt0063540                                  Sunghursh
tt0066787             One Day Before the Rainy Season
tt0069049                  The Other Side of the Wind
tt0069204                                Sabse Bada Sukh
tt0100275                  The Wandering Soap Opera
```

```
...                                                ...
tt9916538                          Kuambil Lagi Hatiku
tt9916622  Rodolpho Teóphilo - O Legado de um Pioneiro
tt9916706                               Dankyavar Danka
tt9916730                                       6 Gunn
tt9916754            Chico Albuquerque - Revelações

                                     original_title  start_year  \
tconst
tt0063540                                 Sunghursh        2013
tt0066787                              Ashad Ka Ek Din        2019
tt0069049                   The Other Side of the Wind        2018
tt0069204                              Sabse Bada Sukh        2018
tt0100275                        La Telenovela Errante        2017
...                                              ...         ...
tt9916538                          Kuambil Lagi Hatiku        2019
tt9916622  Rodolpho Teóphilo - O Legado de um Pioneiro        2015
tt9916706                               Dankyavar Danka        2013
tt9916730                                       6 Gunn        2017
tt9916754            Chico Albuquerque - Revelações        2013

           runtime_minutes                genres
tconst
tt0063540            175.0    Action,Crime,Drama
tt0066787            114.0       Biography,Drama
tt0069049            122.0                 Drama
tt0069204              NaN          Comedy,Drama
tt0100275             80.0  Comedy,Drama,Fantasy
...                    ...                   ...
tt9916538            123.0                 Drama
tt9916622              NaN           Documentary
tt9916706              NaN                Comedy
tt9916730            116.0                   NaN
tt9916754              NaN           Documentary

[146144 rows x 5 columns],     release_date                                        movie  \
id
1   Dec 18, 2009                                    Avatar
2   May 20, 2011  Pirates of the Caribbean: On Stranger Tides
3    Jun 7, 2019                                 Dark Phoenix
4    May 1, 2015                     Avengers: Age of Ultron
5   Dec 15, 2017           Star Wars Ep. VIII: The Last Jedi
..           ...                                         ...
78  Dec 31, 2018                                    Red 11
79   Apr 2, 1999                                 Following
80  Jul 13, 2005              Return to the Land of Wonders
81  Sep 29, 2015                       A Plague So Pleasant
82   Aug 5, 2005                          My Date With Drew
```

```
   production_budget domestic_gross worldwide_gross
id
1       $425,000,000   $760,507,625  $2,776,345,279
2       $410,600,000   $241,063,875  $1,045,663,875
3       $350,000,000    $42,762,350    $149,762,350
4       $330,600,000   $459,005,868  $1,403,013,963
5       $317,000,000   $620,181,382  $1,316,721,747
..               ...            ...             ...
78            $7,000            $0              $0
79            $6,000        $48,482        $240,495
80            $5,000         $1,338          $1,338
81            $1,400            $0              $0
82            $1,100       $181,041        $181,041

[5782 rows x 5 columns],                                                  studio  domestic_gross  \
title
Toy Story 3                                          BV     415000000.0
Alice in Wonderland (2010)                           BV     334200000.0
Harry Potter and the Deathly Hallows Part 1          WB     296000000.0
Inception                                            WB     292600000.0
Shrek Forever After                                P/DW     238700000.0
...                                                 ...             ...
The Quake                                        Magn.          6200.0
Edward II (2018 re-release)                         FM          4800.0
El Pacto                                          Sony          2500.0
The Swan                                   Synergetic          2400.0
An Actor Prepares                                Grav.          1700.0

                                          foreign_gross  year
title
Toy Story 3                                   652000000  2010
Alice in Wonderland (2010)                    691300000  2010
Harry Potter and the Deathly Hallows Part 1    664300000  2010
Inception                                     535700000  2010
Shrek Forever After                           513900000  2010
...                                                 ...   ...
The Quake                                         NaN  2018
Edward II (2018 re-release)                       NaN  2018
El Pacto                                          NaN  2018
The Swan                                          NaN  2018
An Actor Prepares                                 NaN  2018

[3387 rows x 4 columns],           ordering      nconst  category       job           characters
tconst
tt0111414         1   nm0246005     actor       NaN           ["The Man"]
tt0111414         2   nm0398271  director       NaN                   NaN
tt0111414         3   nm3739909  producer  producer                   NaN
tt0323808        10   nm0059247    editor       NaN                   NaN
tt0323808         1   nm3579312   actress       NaN      ["Beth Boothby"]
```

```
...             ...        ...       ...       ...                      ...
tt9692684         1   nm0186469     actor       NaN  ["Ebenezer Scrooge"]
tt9692684         2   nm4929530      self       NaN   ["Herself","Regan"]
tt9692684         3  nm10441594  director       NaN                   NaN
tt9692684         4   nm6009913    writer    writer                   NaN
tt9692684         5  nm10441595  producer  producer                   NaN

[1028186 rows x 5 columns]])
```

In [4]:
```
csv_files_dict.keys()
```

Out[4]:
```
dict_keys(['imdb_title_crew_gz', 'tmdb_movies_gz', 'imdb_title_akas_gz', 'imdb_title_ratings_gz', 'imdb_name_ba
sics_gz', 'imdb_title_basics_gz', 'tn_movie_budgets_gz', 'bom_movie_gross_gz', 'imdb_title_principals_gz'])
```

In [5]:
```
imdb_title_principals_df = csv_files_dict['imdb_title_principals_gz']
```

In [6]:
```
tmdb_movies_df = csv_files_dict['tmdb_movies_gz']
```

In [7]:
```
bom_movie_gross_df = csv_files_dict['bom_movie_gross_gz']
```

In [8]:
```
imdb_title_basics_df = csv_files_dict['imdb_title_basics_gz']
```

In [9]:
```
imdb_title_crew_df = csv_files_dict['imdb_title_crew_gz']
```

In [10]:
```
imdb_name_basics_df = csv_files_dict['imdb_name_basics_gz']
```

In [11]:
```
imdb_title_akas_df = csv_files_dict['imdb_title_akas_gz']
```

In [12]:
```
tn_movie_budgets_df = csv_files_dict['tn_movie_budgets_gz']
```

Top Grossing Genres Domestically

imdb_title_basics DataFrame, setting index for 'primary title' column

In [13]:
```
imdb_title_basics_df.set_index('primary_title', inplace=True)
imdb_title_basics_df.head()
```

Out[13]:

primary_title	original_title	start_year	runtime_minutes	genres
Sunghursh	Sunghursh	2013	175.0	Action,Crime,Drama
One Day Before the Rainy Season	Ashad Ka Ek Din	2019	114.0	Biography,Drama
The Other Side of the Wind	The Other Side of the Wind	2018	122.0	Drama
Sabse Bada Sukh	Sabse Bada Sukh	2018	NaN	Comedy,Drama
The Wandering Soap Opera	La Telenovela Errante	2017	80.0	Comedy,Drama,Fantasy

Data Cleaning

Joining imdb_title_basics and bom_movie_gross data frames, by doing so these two data frames will give us the genres and domestic gross columns we need

In [14]:
```
genres_domestic_gross_foreign_gross_df = imdb_title_basics_df.join(bom_movie_gross_df, how='inner')
```

In [15]:
```
genres_domestic_gross_foreign_gross_df.head()
```

Out[15]:

	original_title	start_year	runtime_minutes	genres	studio	domestic_gross	foreign_gross	year
'71	'71	2014	99.0	Action,Drama,Thriller	RAtt.	1300000.0	355000	2015
1,000 Times Good Night	Tusen ganger god natt	2013	117.0	Drama,War	FM	53900.0	NaN	2014
10 Cloverfield Lane	10 Cloverfield Lane	2016	103.0	Drama,Horror,Mystery	Par.	72100000.0	38100000	2016
10 Years	10 Years	2011	100.0	Comedy,Drama,Romance	Anch.	203000.0	NaN	2012
1001 Grams	1001 Gram	2014	93.0	Drama	KL	11000.0	NaN	2015

Using a split to remove the commas from the 'genres' column

In [16]:
```
genres_domestic_gross_foreign_gross_df.genres = genres_domestic_gross_foreign_gross_df.genres.str.split(",")
```

The explode of 'genres' column will give each genres its own row

In [17]:
```
genres_domestic_gross_foreign_gross_df.explode('genres')
```

Out[17]:

	original_title	start_year	runtime_minutes	genres	studio	domestic_gross	foreign_gross	year
'71	'71	2014	99.0	Action	RAtt.	1300000.0	355000	2015
'71	'71	2014	99.0	Drama	RAtt.	1300000.0	355000	2015
'71	'71	2014	99.0	Thriller	RAtt.	1300000.0	355000	2015
1,000 Times Good Night	Tusen ganger god natt	2013	117.0	Drama	FM	53900.0	NaN	2014
1,000 Times Good Night	Tusen ganger god natt	2013	117.0	War	FM	53900.0	NaN	2014
...	...	...	...	...	...	...	...	...
Zookeeper	Zookeeper	2011	102.0	Romance	Sony	80400000.0	89500000	2011
Zoolander 2	Zoolander 2	2016	101.0	Comedy	Par.	28800000.0	27900000	2016
Zootopia	Zootopia	2016	108.0	Adventure	BV	341300000.0	682500000	2016
Zootopia	Zootopia	2016	108.0	Animation	BV	341300000.0	682500000	2016
Zootopia	Zootopia	2016	108.0	Comedy	BV	341300000.0	682500000	2016

7471 rows × 8 columns

Naming the new data frame and once again doing an explode and reset index

In [18]:
```
genres_dg_fg_df = genres_domestic_gross_foreign_gross_df.explode('genres').reset_index(drop=True)
```

In [19]:
```
genres_dg_fg_df.head(n=10)
```

Out[19]:

	original_title	start_year	runtime_minutes	genres	studio	domestic_gross	foreign_gross	year
0	'71	2014	99.0	Action	RAtt.	1300000.0	355000	2015
1	'71	2014	99.0	Drama	RAtt.	1300000.0	355000	2015
2	'71	2014	99.0	Thriller	RAtt.	1300000.0	355000	2015
3	Tusen ganger god natt	2013	117.0	Drama	FM	53900.0	NaN	2014
4	Tusen ganger god natt	2013	117.0	War	FM	53900.0	NaN	2014
5	10 Cloverfield Lane	2016	103.0	Drama	Par.	72100000.0	38100000	2016
6	10 Cloverfield Lane	2016	103.0	Horror	Par.	72100000.0	38100000	2016
7	10 Cloverfield Lane	2016	103.0	Mystery	Par.	72100000.0	38100000	2016

	original_title	start_year	runtime_minutes	genres	studio	domestic_gross	foreign_gross	year
8	10 Years	2011	100.0	Comedy	Anch.	203000.0	NaN	2012
9	10 Years	2011	100.0	Drama	Anch.	203000.0	NaN	2012

Groupby genres_dg_fg_mean_df

This will give generate the mean gross of a particular genre

In [20]:
```
genres_dg_fg_mean_df = genres_dg_fg_df.groupby('genres').mean()
```

In [21]:
```
genres_dg_fg_mean_df.head()
```

Out[21]:

genres	start_year	runtime_minutes	domestic_gross	year
Action	2014.024096	115.061444	5.841816e+07	2014.072289
Adventure	2014.165919	109.622472	9.440941e+07	2014.278027
Animation	2014.197452	94.812903	8.732619e+07	2014.477707
Biography	2014.392157	107.964052	2.098164e+07	2014.673203
Comedy	2013.663212	104.660297	3.378180e+07	2013.829016

Reseting the index for the 'genres' column

In [22]:
```
genres_dg_fg_mean_df.reset_index(inplace=True)
```

In [23]:
```
genres_dg_fg_mean_df.head()
```

Out[23]:

	genres	start_year	runtime_minutes	domestic_gross	year
0	Action	2014.024096	115.061444	5.841816e+07	2014.072289
1	Adventure	2014.165919	109.622472	9.440941e+07	2014.278027
2	Animation	2014.197452	94.812903	8.732619e+07	2014.477707
3	Biography	2014.392157	107.964052	2.098164e+07	2014.673203
4	Comedy	2013.663212	104.660297	3.378180e+07	2013.829016

Data Analysis

In [24]:
```
import matplotlib
import matplotlib.pyplot as plt

%matplotlib inline
import numpy as np
```

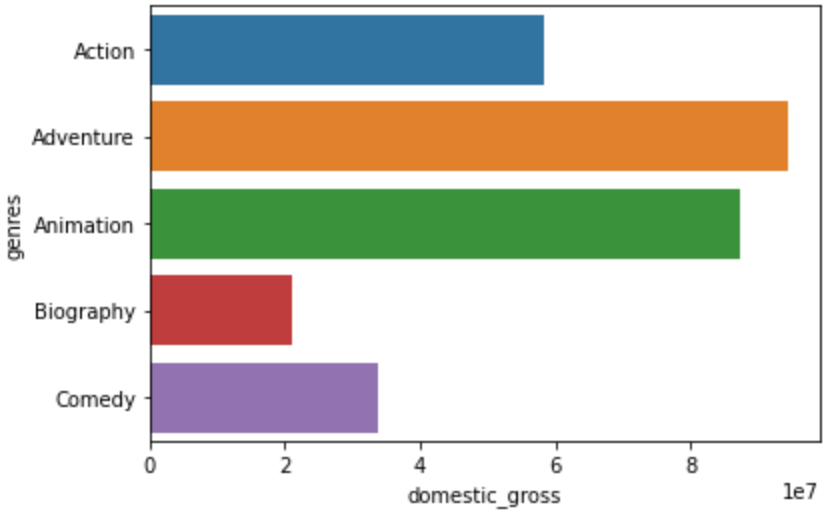
In [25]:
```
genres_dg_fg_mean_df.head()
```

Out[25]:

	genres	start_year	runtime_minutes	domestic_gross	year
0	Action	2014.024096	115.061444	5.841816e+07	2014.072289
1	Adventure	2014.165919	109.622472	9.440941e+07	2014.278027
2	Animation	2014.197452	94.812903	8.732619e+07	2014.477707
3	Biography	2014.392157	107.964052	2.098164e+07	2014.673203
4	Comedy	2013.663212	104.660297	3.378180e+07	2013.829016

In [26]:
```
import seaborn as sns
```

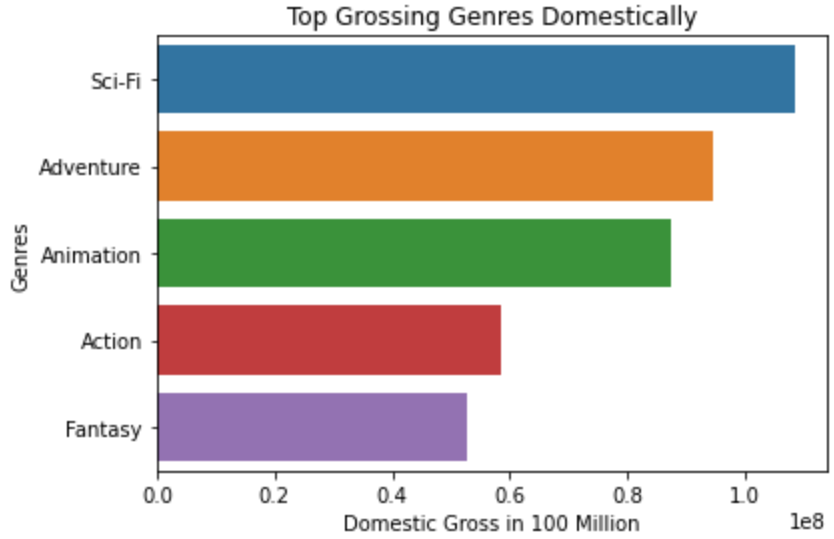
In [27]:
```
sns.barplot(x='domestic_gross', y='genres', data=genres_dg_fg_mean_df.iloc[0:5]);
```



In [28]:
```
genres_dg_fg_mean_df.sort_values(by='domestic_gross', ascending=False, inplace=True)
```

In [29]:
```
#plt.figure(figsize=(10,8))

sns.barplot(x='domestic_gross', y='genres', data=genres_dg_fg_mean_df.iloc[0:5])
plt.xlabel('Domestic Gross in 100 Million')
plt.ylabel('Genres')
plt.title('Top Grossing Genres Domestically');
```



The analysis concludes that the three top grossing genres domestically are:

- Sci-Fi
- Adventure
- Animation

Top Grossing Directors Domestically

imdb_title_crew and imdb_name_basics data frames and then once again merging the newly created data frame with imdb_title_akas. By merging these data sets we get the top grossing directors domestically

resetting index for the 'tconst' column

In [30]:
```
imdb_title_crew_df.reset_index(inplace=True)
```

In [31]:
```
imdb_title_crew_df.head()
```

Out[31]:

	tconst	directors	writers
0	tt0285252	nm0899854	nm0899854
1	tt0438973	NaN	nm0175726,nm1802864
2	tt0462036	nm1940585	nm1940585
3	tt0835418	nm0151540	nm0310087,nm0841532
4	tt0878654	nm0089502,nm2291498,nm2292011	nm0284943

Merging the imdb_title_crew and imdb_name basics data frames

In [32]:
```
tc_directors_nb_nconst_df = imdb_title_crew_df.merge(imdb_name_basics_df,
                                                     left_on='directors',
                                                     right_on='nconst')
tc_directors_nb_nconst_df.head()
```

Out[32]:

	tconst	directors	writers	primary_name	birth_year	death_year	primary_pr
0	tt0285252	nm0899854	nm0899854	Tony Vitale	1964.0	NaN	producer,direc
1	tt0462036	nm1940585	nm1940585	Bill Haley	NaN	NaN	director,writer
2	tt0835418	nm0151540	nm0310087,nm0841532	Jay Chandrasekhar	1968.0	NaN	director,ac
3	tt0859635	nm0151540	nm0151540,nm0373571,nm0501399,nm0815418,nm0831479	Jay Chandrasekhar	1968.0	NaN	director,ac
4	tt0879859	nm2416460	NaN	Eric Manchester	NaN	NaN	direc

Second merge of the newly created data frame (tc_directors_nb_nconst_df) with imdb_title_akas_df

In [33]:
```
tc_directors_nb_nconst_takas_tid_df = tc_directors_nb_nconst_df.merge(imdb_title_akas_df,
                                                                      left_on='tconst',
                                                                      right_on='title_id')
tc_directors_nb_nconst_takas_tid_df.head()
```

Out[33]:

	tconst	directors	writers	primary_name	birth_year	death_year	primary_profession	known_for_
0	tt0285252	nm0899854	nm0899854	Tony Vitale	1964.0	NaN	producer,director,writer	tt0285252,tt0106489,tt0119465,tt03
1	tt0285252	nm0899854	nm0899854	Tony Vitale	1964.0	NaN	producer,director,writer	tt0285252,tt0106489,tt0119465,tt03
2	tt0285252	nm0899854	nm0899854	Tony Vitale	1964.0	NaN	producer,director,writer	tt0285252,tt0106489,tt0119465,tt03
3	tt0285252	nm0899854	nm0899854	Tony Vitale	1964.0	NaN	producer,director,writer	tt0285252,tt0106489,tt0119465,tt03
4	tt0285252	nm0899854	nm0899854	Tony Vitale	1964.0	NaN	producer,director,writer	tt0285252,tt0106489,tt0119465,tt03

Third merge of newly create data frame and genres_dg_fg_df

In [34]:
```
director_genres = tc_directors_nb_nconst_takas_tid_df.merge(genres_dg_fg_df,
                                                            left_on='title',
                                                            right_on='original_title')
```

Removing duplicates to cleanup data

In [35]:
```
director_genres_nodup_df = director_genres.drop_duplicates(subset='original_title')
```

In [36]:
```
director_genres_nodup_df.head()
```

Out[36]:

	tconst	directors	writers	primary_name	birth_year	death_year	primary_profession	
0	tt0835418	nm0151540	nm0310087,nm0841532	Jay Chandrasekhar	1968.0	NaN	director,actor,writer	tt0144557,tt0486551,t
2	tt1904996	nm0000431	nm0572352,nm0922799	Taylor Hackford	1944.0	NaN	producer,director,writer	tt0109642,tt0084434,tt
50	tt1126618	nm0585011	nm0112459	Roger Michell	1956.0	NaN	director,producer,actor	tt0125439,tt0127319,tt
62	tt2392326	nm0585011	nm0475659	Roger Michell	1956.0	NaN	director,producer,actor	tt0125439,tt0127319,tt

	tconst	directors	writers	primary_name	birth_year	death_year	primary_profession	
74	tt1477855	nm0585011	nm0625695	Roger Michell	1956.0	NaN	director,producer,actor	tt0125439,tt0127319,tt

5 rows × 23 columns

Split method is being performed to remove commas from the the 'primary_profession' column

In [37]:
```
director_genres_nodup_df.primary_profession = director_genres_nodup_df.primary_profession.str.split(",")
```

```
/Users/joemendoza/opt/anaconda3/envs/learn-env/lib/python3.8/site-packages/pandas/core/generic.py:5168: Setting
WithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#ret
urning-a-view-versus-a-copy
  self[name] = value
```

Explode method is being used to give rows the profession titles in 'primary_professions' column

In [38]:
```
director_genres_nodup_explode_df = director_genres_nodup_df.explode('primary_profession')
```

In [39]:
```
director_genres_nodup_explode_df.head()
```

Out[39]:

	tconst	directors	writers	primary_name	birth_year	death_year	primary_profession	kı
0	tt0835418	nm0151540	nm0310087,nm0841532	Jay Chandrasekhar	1968.0	NaN	director	tt0144557,tt0486551,tt033
0	tt0835418	nm0151540	nm0310087,nm0841532	Jay Chandrasekhar	1968.0	NaN	actor	tt0144557,tt0486551,tt033
0	tt0835418	nm0151540	nm0310087,nm0841532	Jay Chandrasekhar	1968.0	NaN	writer	tt0144557,tt0486551,tt033
2	tt1904996	nm0000431	nm0572352,nm0922799	Taylor Hackford	1944.0	NaN	producer	tt0109642,tt0084434,tt035
2	tt1904996	nm0000431	nm0572352,nm0922799	Taylor Hackford	1944.0	NaN	director	tt0109642,tt0084434,tt035

5 rows × 23 columns

Explode method is being used to single out directors in the 'primary_profession' column

In [40]:
```
director_genres_nodup_explode_df = director_genres_nodup_explode_df[director_genres_nodup_explode_df['primary_p
```

In [41]:
```
director_genres_nodup_explode_df.head()
```

Out[41]:

	tconst	directors	writers	primary_name	birth_year	death_year	primary_profession	
0	tt0835418	nm0151540	nm0310087,nm0841532	Jay Chandrasekhar	1968.0	NaN	director	tt0144557,tt0486551,tt03
2	tt1904996	nm0000431	nm0572352,nm0922799	Taylor Hackford	1944.0	NaN	director	tt0109642,tt0084434,tt03
50	tt1126618	nm0585011	nm0112459	Roger Michell	1956.0	NaN	director	tt0125439,tt0127319,tt04
62	tt2392326	nm0585011	nm0475659	Roger Michell	1956.0	NaN	director	tt0125439,tt0127319,tt04
74	tt1477855	nm0585011	nm0625695	Roger Michell	1956.0	NaN	director	tt0125439,tt0127319,tt04

5 rows × 23 columns

Groupby method being used attain the mean if the 'primary_name' column

In [42]:
```
director_genres_nodup_mean_df = director_genres_nodup_explode_df.groupby('primary_name').mean()
```

In [43]:
```
director_genres_nodup_mean_df.head()
```

Out[43]:

primary_name	birth_year	death_year	ordering	is_original_title	start_year	runtime_minutes	domestic_gross	year
Aanand L. Rai	NaN	NaN	2.0	0.0	2015.0	128.0	3000000.0	2015.0
Aaron Katz	1981.0	NaN	2.0	1.0	2010.0	96.0	141000.0	2011.0
Aaron Wilson	NaN	NaN	3.0	1.0	2013.0	84.0	8500.0	2014.0
Abbas Kiarostami	1940.0	2016.0	16.0	0.0	2010.0	106.0	1400000.0	2011.0

primary_name	birth_year	death_year	ordering	is_original_title	start_year	runtime_minutes	domestic_gross	year
Abdellatif Kechiche	1960.0	NaN	13.0	0.0	2013.0	180.0	2200000.0	2013.0

Resetting index

In [44]:
```
director_genres_nodup_mean_df.reset_index(inplace=True)
```

In [45]:
```
director_genres_nodup_mean_df.head()
```

Out[45]:

	primary_name	birth_year	death_year	ordering	is_original_title	start_year	runtime_minutes	domestic_gross	year
0	Aanand L. Rai	NaN	NaN	2.0	0.0	2015.0	128.0	3000000.0	2015.0
1	Aaron Katz	1981.0	NaN	2.0	1.0	2010.0	96.0	141000.0	2011.0
2	Aaron Wilson	NaN	NaN	3.0	1.0	2013.0	84.0	8500.0	2014.0
3	Abbas Kiarostami	1940.0	2016.0	16.0	0.0	2010.0	106.0	1400000.0	2011.0
4	Abdellatif Kechiche	1960.0	NaN	13.0	0.0	2013.0	180.0	2200000.0	2013.0

Sorting values of the mean of the 'domestic_gross' in descending order

In [46]:
```
director_genres_nodup_mean_df.sort_values(by='domestic_gross', ascending=False, inplace=True)
```

In [47]:
```
director_genres_nodup_mean_df.head()
```

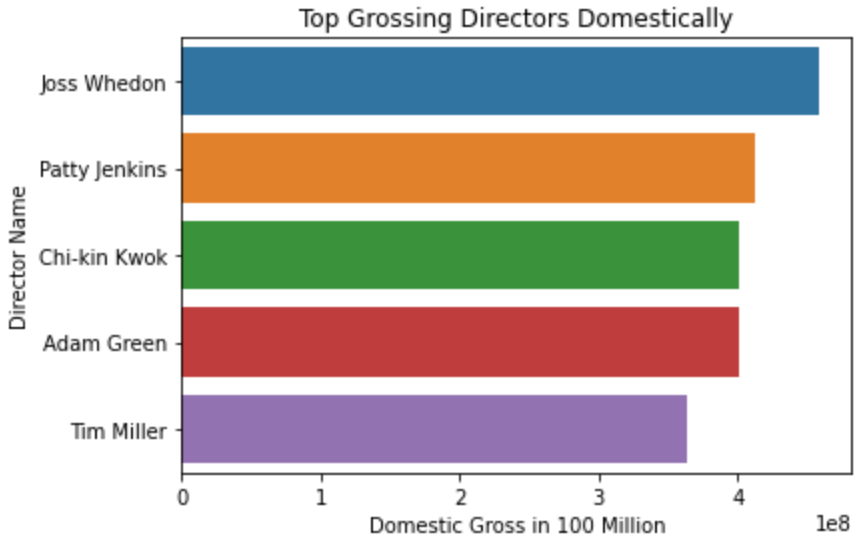
Out[47]:

	primary_name	birth_year	death_year	ordering	is_original_title	start_year	runtime_minutes	domestic_gross	year
802	Joss Whedon	1964.0	NaN	15.0	0.0	2015.0	141.0	459000000.0	2015.0
1167	Patty Jenkins	1971.0	NaN	11.0	0.0	2017.0	141.0	412600000.0	2017.0
253	Chi-kin Kwok	NaN	NaN	3.0	1.0	2010.0	92.0	400700000.0	2013.0
10	Adam Green	1975.0	NaN	10.0	0.0	2010.0	93.0	400700000.0	2013.0
1543	Tim Miller	NaN	NaN	10.0	1.0	2016.0	108.0	363100000.0	2016.0

Data Analysis

In [48]:
```
#plt.figure(figsize=(10,8))

sns.barplot(x='domestic_gross', y='primary_name', data=director_genres_nodup_mean_df.iloc[0:5]);
plt.xlabel('Domestic Gross in 100 Million')
plt.ylabel('Director Name')
plt.title('Top Grossing Directors Domestically');
```



The analysis concludes that the three top grossing directors domestically are:

- Joss Whedon
- Patty Jenkins
- Chi-kin Kwok

Domestic Gross by Release Month

In [49]:
```
tn_movie_budgets_df.head()
```

Out[49]:

id	release_date	movie	production_budget	domestic_gross	worldwide_gross
1	Dec 18, 2009	Avatar	$425,000,000	$760,507,625	$2,776,345,279
2	May 20, 2011	Pirates of the Caribbean: On Stranger Tides	$410,600,000	$241,063,875	$1,045,663,875

id	release_date	movie	production_budget	domestic_gross	worldwide_gross
3	Jun 7, 2019	Dark Phoenix	$350,000,000	$42,762,350	$149,762,350
4	May 1, 2015	Avengers: Age of Ultron	$330,600,000	$459,005,868	$1,403,013,963
5	Dec 15, 2017	Star Wars Ep. VIII: The Last Jedi	$317,000,000	$620,181,382	$1,316,721,747

Setting up data frame emphasizing 'release_month' and 'release_date'

In [50]:
```
tn_movie_budgets_df.release_date = pd.to_datetime(tn_movie_budgets_df.release_date)
```

In [51]:
```
tn_movie_budgets_df['release_month'] = tn_movie_budgets_df.release_date.dt.month_name()
```

In [52]:
```
tn_movie_budgets_df.head()
```

Out[52]:

id	release_date	movie	production_budget	domestic_gross	worldwide_gross	release_month
1	2009-12-18	Avatar	$425,000,000	$760,507,625	$2,776,345,279	December
2	2011-05-20	Pirates of the Caribbean: On Stranger Tides	$410,600,000	$241,063,875	$1,045,663,875	May
3	2019-06-07	Dark Phoenix	$350,000,000	$42,762,350	$149,762,350	June
4	2015-05-01	Avengers: Age of Ultron	$330,600,000	$459,005,868	$1,403,013,963	May
5	2017-12-15	Star Wars Ep. VIII: The Last Jedi	$317,000,000	$620,181,382	$1,316,721,747	December

Removing money signs and comas from three columns

In [53]:
```
cols = ['production_budget', 'domestic_gross', 'worldwide_gross']
tn_movie_budgets_df[cols] = tn_movie_budgets_df[cols].replace({'\$':'', ',':''}, regex=True)
```

Converting specific columns into integers within three data frames

In [54]:
```
tn_movie_budgets_df['production_budget'] = tn_movie_budgets_df['production_budget'].astype(int)
```

In [55]:
```
tn_movie_budgets_df['domestic_gross'] = tn_movie_budgets_df['domestic_gross'].astype(int)
```

In [56]:
```
tn_movie_budgets_df['worldwide_gross'] = tn_movie_budgets_df['worldwide_gross'].astype(int)
```

In [57]:
```
tn_movie_budgets_df.head()
```

Out[57]:

id	release_date	movie	production_budget	domestic_gross	worldwide_gross	release_month
1	2009-12-18	Avatar	425000000	760507625	2776345279	December
2	2011-05-20	Pirates of the Caribbean: On Stranger Tides	410600000	241063875	1045663875	May
3	2019-06-07	Dark Phoenix	350000000	42762350	149762350	June
4	2015-05-01	Avengers: Age of Ultron	330600000	459005868	1403013963	May
5	2017-12-15	Star Wars Ep. VIII: The Last Jedi	317000000	620181382	1316721747	December

Groupby and mean method used for the 'release_month' column

In [58]:
```
tn_movie_budgets_gbmonth_df = tn_movie_budgets_df.groupby('release_month').mean()
```

Sorting Values of 'domestic_gross' column in descending order

In [59]:
```
tn_movie_budgets_gbmonth_df.sort_values(by='domestic_gross', ascending=False, inplace=True)
```

Reseting index

In [60]:
```
tn_movie_budgets_gbmonth_df.reset_index(inplace=True)
```

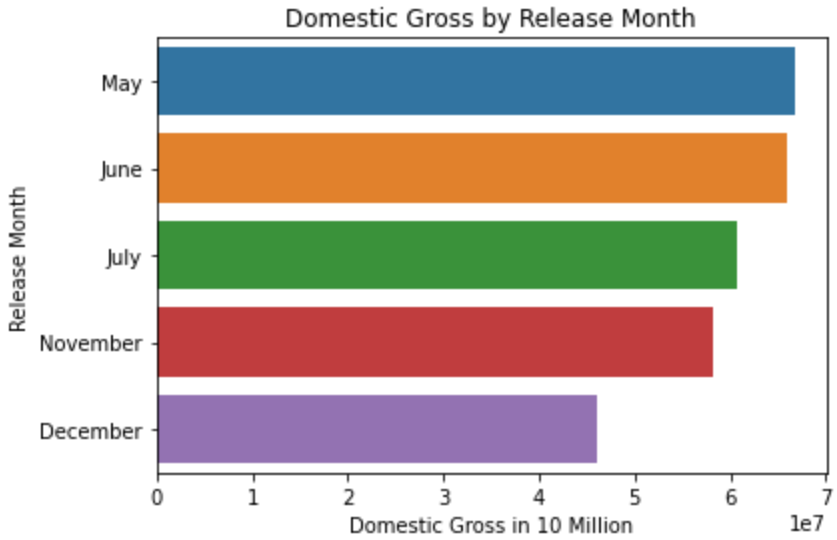
In [61]:
```
tn_movie_budgets_gbmonth_df.head()
```

Out[61]:

	release_month	production_budget	domestic_gross	worldwide_gross
0	May	4.713520e+07	6.669795e+07	1.622680e+08
1	June	4.309912e+07	6.582791e+07	1.425230e+08
2	July	4.254616e+07	6.072804e+07	1.409636e+08
3	November	4.260006e+07	5.818117e+07	1.357416e+08
4	December	3.325161e+07	4.610082e+07	1.016932e+08

Data Analysis

In [62]:
```
#plt.figure(figsize=(10,8))
sns.barplot(x='domestic_gross', y='release_month', data=tn_movie_budgets_gbmonth_df.iloc[0:5]);
plt.xlabel('Domestic Gross in 10 Million')
plt.ylabel('Release Month')
plt.title('Domestic Gross by Release Month');
```



The analysis concludes that the three top domestic gross by release month:

- May
- June
- July

Conclusions

> These results/analysis shows insight towards three recommended steps in helping to choose what films should be created by the film studio

-The three top grossing genres domestically are Sci-Fi, Adventure and Action films

These genres are good starting points

-**The top three top grossing directors domestically would be Joss Whedon, Patty Jenkins and Chi-kin Kwok**

Going by their track records all three directors would be good fits to direct film in the three top grossing genres mentioned above

-**The top three domestic gross by release month would be May, June and July**

The seasonal launch release time for a film is crucial, Spring/Summer seem to be common seasons associated with positive audience attendance to films

Other investigations

- once domestics releases are profitable, that's when the studio should consider thinking about global film releases
- there may be overlapping data when considering top genre, director and release month for a global market