Testing

November 5, 2017

1 Which genres are most popular from year to year?

import libraries and read the data set

```
In [28]: import pandas as pd
         import numpy as np
         import matplotlib.pyplot as plt
         %matplotlib inline

         df = pd.read_csv('tmdb-movies.csv')
```

shape of the data frame

```
In [5]: df.shape
```

```
Out[5]: (10866, 21)
```

Columns of the data frame for better understanding

```
In [6]: df.columns
```

```
Out[6]: Index(['id', 'imdb_id', 'popularity', 'budget', 'revenue', 'original_title',
               'cast', 'homepage', 'director', 'tagline', 'keywords', 'overview',
               'runtime', 'genres', 'production_companies', 'release_date',
               'vote_count', 'vote_average', 'release_year', 'budget_adj',
               'revenue_adj'],
              dtype='object')
```

visuvalizing the head of data

```
In [7]: df.head(2)
```

```
Out[7]:        id    imdb_id  popularity     budget     revenue      original_title  \
        0  135397  tt0369610   32.985763  150000000  1513528810      Jurassic World
        1   76341  tt1392190   28.419936  150000000   378436354  Mad Max: Fury Road

                                                cast  \
        0  Chris Pratt|Bryce Dallas Howard|Irrfan Khan|Vi...
```

```
1  Tom Hardy|Charlize Theron|Hugh Keays-Byrne|Nic...

                        homepage         director             tagline  \
0  http://www.jurassicworld.com/  Colin Trevorrow   The park is open.
1    http://www.madmaxmovie.com/    George Miller  What a Lovely Day.

       ...                                                  overview runtime  \
0      ...       Twenty-two years after the events of Jurassic ...     124
1      ...       An apocalyptic story set in the furthest reach...     120

                                     genres  \
0  Action|Adventure|Science Fiction|Thriller
1  Action|Adventure|Science Fiction|Thriller

                                production_companies release_date vote_count  \
0  Universal Studios|Amblin Entertainment|Legenda...       6/9/15       5562
1  Village Roadshow Pictures|Kennedy Miller Produ...      5/13/15       6185

   vote_average  release_year    budget_adj   revenue_adj
0           6.5          2015  1.379999e+08  1.392446e+09
1           7.1          2015  1.379999e+08  3.481613e+08

[2 rows x 21 columns]
```

Description of data to clear the null values

```
In [8]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10866 entries, 0 to 10865
Data columns (total 21 columns):
id                      10866 non-null int64
imdb_id                 10856 non-null object
popularity              10866 non-null float64
budget                  10866 non-null int64
revenue                 10866 non-null int64
original_title          10866 non-null object
cast                    10790 non-null object
homepage                2936 non-null object
director                10822 non-null object
tagline                 8042 non-null object
keywords                9373 non-null object
overview                10862 non-null object
runtime                 10866 non-null int64
genres                  10843 non-null object
production_companies    9836 non-null object
release_date            10866 non-null object
vote_count              10866 non-null int64
```

```
vote_average            10866 non-null float64
release_year            10866 non-null int64
budget_adj              10866 non-null float64
revenue_adj             10866 non-null float64
dtypes: float64(4), int64(6), object(11)
memory usage: 1.7+ MB
```

The column 'popularity' has no NaN, so it not needed to drop nulls, but the value counts of the popularity has long list of float values. Which will be hard to analyze. So, we round of the popularity column to nearest integer.

```
In [9]: df['popularity']= round(df['popularity'])
```

```
In [10]: df.head(2)
```

```
Out[10]:        id    imdb_id  popularity     budget     revenue      original_title  \
         0  135397  tt0369610        33.0  150000000  1513528810      Jurassic World
         1   76341  tt1392190        28.0  150000000   378436354  Mad Max: Fury Road

                                                cast  \
         0  Chris Pratt|Bryce Dallas Howard|Irrfan Khan|Vi...
         1  Tom Hardy|Charlize Theron|Hugh Keays-Byrne|Nic...

                             homepage         director             tagline  \
         0  http://www.jurassicworld.com/  Colin Trevorrow   The park is open.
         1    http://www.madmaxmovie.com/    George Miller  What a Lovely Day.

               ...                                                overview runtime  \
         0     ...       Twenty-two years after the events of Jurassic ...     124
         1     ...       An apocalyptic story set in the furthest reach...     120

                                          genres  \
         0  Action|Adventure|Science Fiction|Thriller
         1  Action|Adventure|Science Fiction|Thriller

                                    production_companies release_date vote_count  \
         0  Universal Studios|Amblin Entertainment|Legenda...       6/9/15       5562
         1  Village Roadshow Pictures|Kennedy Miller Produ...      5/13/15       6185

            vote_average  release_year    budget_adj   revenue_adj
         0           6.5          2015  1.379999e+08  1.392446e+09
         1           7.1          2015  1.379999e+08  3.481613e+08

         [2 rows x 21 columns]
```

Now, value counts of popularity counts looks as.

```
In [11]: df['popularity'].value_counts()
```

```
Out[11]: 0.0     6739
         1.0     3211
         2.0      540
         3.0      189
         4.0       72
         5.0       39
         6.0       36
         7.0       11
         8.0       10
         9.0        8
         11.0       3
         13.0       2
         14.0       1
         10.0       1
         12.0       1
         25.0       1
         28.0       1
         33.0       1
         Name: popularity, dtype: int64
```

But there are outliers we need popularity on scale 10, so we drop the rows with popularity above 9.0.

```
In [12]: df = df[df['popularity'] <= 9.0]
```

This is how the popularity looks after cleaning.

```
In [13]: df['popularity'].value_counts()
```

```
Out[13]: 0.0    6739
         1.0    3211
         2.0     540
         3.0     189
         4.0      72
         5.0      39
         6.0      36
         7.0      11
         8.0      10
         9.0       8
         Name: popularity, dtype: int64
```

We then check for duplicated rows and drop them

```
In [14]: df[df.duplicated()]
```

```
Out[14]:          id    imdb_id  popularity    budget  revenue original_title  \
         2090  42194  tt0411951         1.0  30000000   967000         TEKKEN

                                                    cast homepage  \
```

```
      2090  Jon Foo|Kelly Overton|Cary-Hiroyuki Tagawa|Ian...      NaN

                director              tagline     ...       \
      2090  Dwight H. Little  Survival is no game     ...

                                                 overview runtime  \
      2090  In the year of 2039, after World Wars destroy ...      92

                                             genres    production_companies  \
      2090  Crime|Drama|Action|Thriller|Science Fiction  Namco|Light Song Films

           release_date vote_count  vote_average  release_year  budget_adj  \
      2090      3/20/10        110           5.0          2010  30000000.0

            revenue_adj
      2090     967000.0

      [1 rows x 21 columns]
```

```
In [15]: df = df.drop(2090)
```

```
In [16]: df[df.duplicated()]
```

```
Out[16]: Empty DataFrame
         Columns: [id, imdb_id, popularity, budget, revenue, original_title, cast, homepage, di
         Index: []

         [0 rows x 21 columns]
```

```
In [17]: df.shape
```

```
Out[17]: (10854, 21)
```

With the following data frame, we have many genres, most of the genres have little movies associated with them, which are trivial for our analyzation, so we filter them out.

```
In [18]: df = df.groupby("genres").filter(lambda x: len(x) >= 50)
```

we just used groupby to filter out genre elements whose contents are more than 50, i.e we dropped genres with movies less than 50.

```
In [19]: df.shape
```

```
Out[19]: (4708, 21)
```

```
In [20]: df['genres'].value_counts()
```

```
Out[20]: Comedy                          712
         Drama                           712
         Documentary                     312
         Drama|Romance                   289
         Comedy|Drama                    280
         Comedy|Romance                  268
         Horror|Thriller                 259
         Horror                          253
         Comedy|Drama|Romance            222
         Drama|Thriller                  138
         Comedy|Family                   102
         Action|Thriller                 100
         Thriller                         93
         Drama|Comedy                     92
         Animation|Family                 90
         Crime|Drama|Thriller             81
         Crime|Drama                      74
         Comedy|Horror                    72
         Drama|Comedy|Romance             64
         Action                           63
         Action|Comedy                    62
         Drama|History                    58
         Action|Crime|Drama|Thriller      54
         Drama|Horror|Thriller            53
         Action|Crime|Thriller            52
         Horror|Science Fiction           52
         Horror|Mystery|Thriller          51
         Comedy|Crime                     50
         Name: genres, dtype: int64
```

We groupby release_year and genres column and take the mean of the popularity column, we use mean over sum, because sum overlooks the importance of genres of little movies but with more popularity, so we take mean of popularity column

```
In [21]: res = df.groupby(['release_year','genres'])['popularity'].mean().reset_index()
```

We then take the list of all genres with maximum popularity in each year.

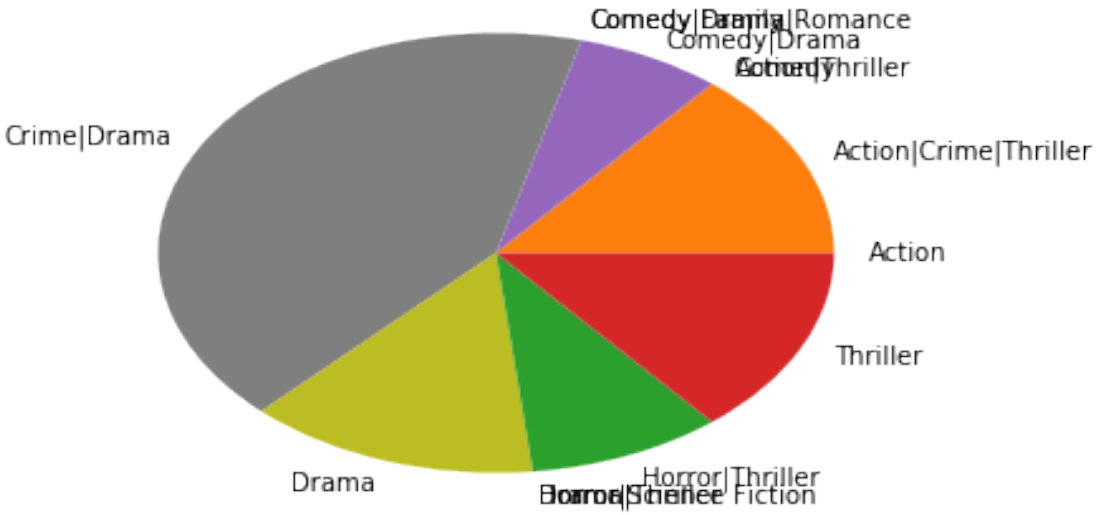
```
In [22]: sol = list()
         for year in res['release_year'].unique():
             sol.append(res.loc[(res[res['release_year']==year]['popularity'].max()==res['popul
```

Now we define a function to get the most popular genres for a given year.

```
In [2]: def popular_genre(year):
            for i in range(len(sol)):
                if all(sol[i]['release_year']==year):
                    return sol[i]['genres'], plt.pie(res[res['release_year']==year]['popularity
```

```
In [24]: print(popular_genre(1976));
```

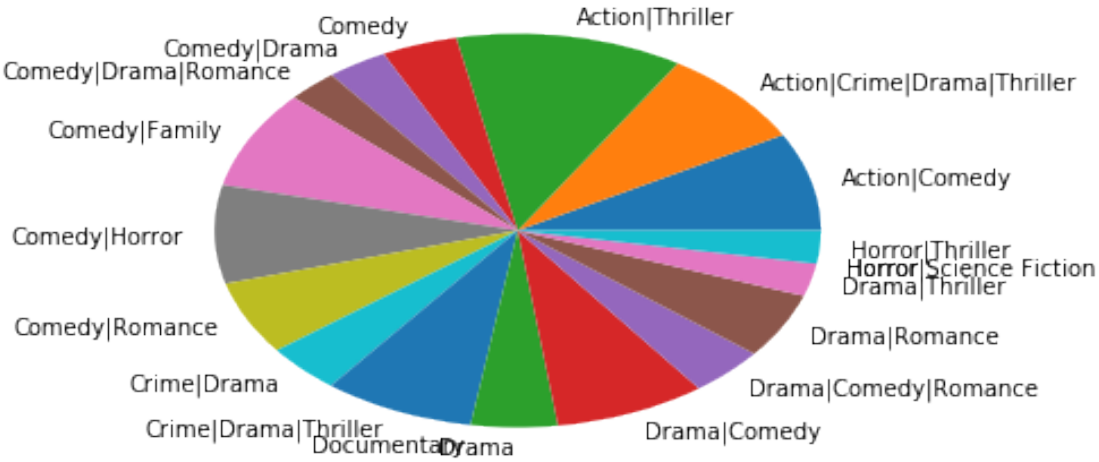
```
(159    Crime|Drama
Name: genres, dtype: object, ([<matplotlib.patches.Wedge object at 0x00000294989A7F98>, <matplo
```



So, we give a year to the function and it will give out all the genres according to its popularity in a pie chart.

```
In [27]: year = int(input('Enter year for popular genre'))
         print(popular_genre(year))
```

```
Enter year for popular genre1995
(472    Action|Thriller
Name: genres, dtype: object, ([<matplotlib.patches.Wedge object at 0x0000029498BA6B00>, <matplo
```

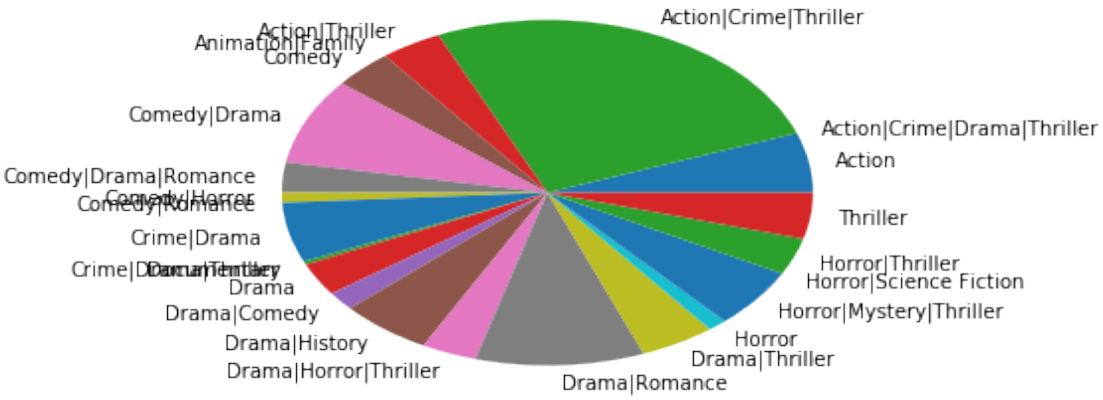


```
In [272]: res[res['release_year']==2015]
```

Out[272]:

	release_year	genres	popularity
957	2015	Action	1.000000
958	2015	Action|Crime|Drama|Thriller	0.000000
959	2015	Action|Crime|Thriller	4.666667
960	2015	Action|Thriller	0.666667
961	2015	Animation|Family	0.000000
962	2015	Comedy	0.648649
963	2015	Comedy|Drama	1.444444
964	2015	Comedy|Drama|Romance	0.500000
965	2015	Comedy|Horror	0.166667
966	2015	Comedy|Romance	0.000000
967	2015	Crime|Drama	1.000000
968	2015	Crime|Drama|Thriller	0.000000
969	2015	Documentary	0.054054
970	2015	Drama	0.551724
971	2015	Drama|Comedy	0.312500
972	2015	Drama|History	1.000000
973	2015	Drama|Horror|Thriller	0.600000
974	2015	Drama|Romance	1.833333
975	2015	Drama|Thriller	0.818182
976	2015	Horror	0.206897
977	2015	Horror|Mystery|Thriller	1.000000
978	2015	Horror|Science Fiction	0.000000
979	2015	Horror|Thriller	0.615385
980	2015	Thriller	0.769231

```
In [276]: plt.pie(res[res['release_year']==2015]['popularity'],labels= res[res['release_year']=
```



In [ ]: