Assignment_1_submission

September 26, 2021

[1]:
```
import pandas as pd
import numpy as np
from collections import defaultdict
%pylab inline
import matplotlib.pyplot as plt
```

```
Populating the interactive namespace from numpy and matplotlib
```

[2]:
```
unames = ['user_id', 'gender', 'age', 'occupation', 'zip']
users = pd.read_table('ml-1m/users.dat', sep='::', header=None, names=unames,␣
 ↪engine='python', encoding='ISO-8859-1')

rnames = ['user_id', 'movie_id', 'rating', 'timestamp']
ratings = pd.read_table('ml-1m/ratings.dat', sep='::', header=None,␣
 ↪names=rnames, engine='python', encoding='ISO-8859-1')

mnames = ['movie_id', 'title', 'genres']
movies = pd.read_table('ml-1m/movies.dat', sep='::', header=None, names=mnames,␣
 ↪engine='python', encoding='ISO-8859-1')
```

[3]:
```
users.head()
```

[3]:

	user_id	gender	age	occupation	zip
0	1	F	1	10	48067
1	2	M	56	16	70072
2	3	M	25	15	55117
3	4	M	45	7	02460
4	5	M	25	20	55455

[4]:
```
ratings.head()
```

[4]:

	user_id	movie_id	rating	timestamp
0	1	1193	5	978300760
1	1	661	3	978302109
2	1	914	3	978301968
3	1	3408	4	978300275
4	1	2355	5	978824291

[5]:
```
movies['year'] = movies['title'].str.extract('\((\d{4})\)', expand=False)
# movies['year'] = pd.to_numeric(movies['year'])
movies.head()
```

[5]:

	movie_id	title	genres
0	1	Toy Story (1995)	Animation|Children's|Comedy
1	2	Jumanji (1995)	Adventure|Children's|Fantasy
2	3	Grumpier Old Men (1995)	Comedy|Romance
3	4	Waiting to Exhale (1995)	Comedy|Drama
4	5	Father of the Bride Part II (1995)	Comedy

	year
0	1995
1	1995
2	1995
3	1995
4	1995

[7]:
```
genres_list = []
for genres in movies['genres']:
    for genre in genres.split('|'):
        if genre not in genres_list:
            genres_list.append(genre)
print(genres_list, " | ", len(genres_list))
```

```
['Animation', "Children's", 'Comedy', 'Adventure', 'Fantasy', 'Romance',
'Drama', 'Action', 'Crime', 'Thriller', 'Horror', 'Sci-Fi', 'Documentary',
'War', 'Musical', 'Mystery', 'Film-Noir', 'Western']  |  18
```

[8]:
```
merged = pd.merge(pd.merge(users, ratings), movies)
merged.head()
```

[8]:

	user_id	gender	age	occupation	zip	movie_id	rating	timestamp
0	1	F	1	10	48067	1193	5	978300760
1	2	M	56	16	70072	1193	5	978298413
2	12	M	25	12	32793	1193	4	978220179
3	15	M	25	7	22903	1193	4	978199279
4	17	M	50	1	95350	1193	5	978158471

	title	genres	year
0	One Flew Over the Cuckoo's Nest (1975)	Drama	1975
1	One Flew Over the Cuckoo's Nest (1975)	Drama	1975
2	One Flew Over the Cuckoo's Nest (1975)	Drama	1975
3	One Flew Over the Cuckoo's Nest (1975)	Drama	1975
4	One Flew Over the Cuckoo's Nest (1975)	Drama	1975

QUESTION - 1:

An aggregate on the number of rating done for each particular genre.

[10]:
```
genre_count = {}
for genre in genres_list:
    x = merged[merged["genres"].str.contains(genre)]
    genre_count[genre] = len(x)
genre_count_df = pd.DataFrame(genre_count.items(), columns=['Genre', 'Count'])
genre_count_df
```

[10]:

	Genre	Count
0	Animation	43293
1	Children's	72186
2	Comedy	356580
3	Adventure	133953
4	Fantasy	36301
5	Romance	147523
6	Drama	354529
7	Action	257457
8	Crime	79541
9	Thriller	189680
10	Horror	76386
11	Sci-Fi	157294
12	Documentary	7910
13	War	68527
14	Musical	41533
15	Mystery	40178
16	Film-Noir	18261
17	Western	20683

[11]:
```
# Male and Female reviews seperated.
genre_count = {}
for genre in genres_list:
    x = merged[merged["genres"].str.contains(genre)]
    genre_count[genre] = x['gender'].value_counts()
genre_count_df = pd.DataFrame.from_dict(genre_count)
```

QUESTION - 2:

Top 5 ranked genres by women on most number of rating.

[33]:
```
print("Top 5 Genres for Females: ")
genre_count_df.loc['F'].sort_values(ascending=False)[:5]
```

```
Top 5 Genres for Females:
```

[33]:
```
Drama       98153
Comedy      96271
Romance     50297
Action      45650
Thriller    40308
Name: F, dtype: int64
```

QUESTION - 3:

Top 5 ranked genres by men on most number of rating.

[14]:
```
print("Top 5 Genres for Males: ")
print(genre_count_df.loc['M'].sort_values(ascending=False)[:5])
```

```
Top 5 Genres for Males:
Comedy      260309
Drama       256376
Action      211807
Thriller    149372
Sci-Fi      129894
Name: M, dtype: int64
```

QUESTION-4:

Average movie's rating for Comedy genre in each era.

[36]:
```
x = merged[merged['genres'].str.contains("Comedy")]
for era in ['197', '198', '199', '200']:
    rating_for_era = x[x['year'].str.contains(era)]
    print("Average rating for Comedy genre in the", int(era)*10, "s: ",␣
 ↪rating_for_era['rating'].mean())

# INTERESTING OBSERVATION:
# No movies available past the year 2000.
# So, the average rating for movies from 2000-2009 => average rating for movies␣
 ↪released in the year 2000.
```

```
Average rating for Comedy genre in the 1970 s:  3.8852724872713558
Average rating for Comedy genre in the 1980 s:  3.574682872458999
Average rating for Comedy genre in the 1990 s:  3.404011899962749
Average rating for Comedy genre in the 2000 s:  3.400386722526587
```

QUESTION-5:

Given a genre and a rating_range(i.e. [3.5, 4]), returns all the movies of that genre and within that rating range sorted by average rating.

[34]:
```
def part5(genre, rating_range):
    x = merged[merged['genres'].str.contains(genre)]
    x = x[(x['rating'] >= rating_range[0]) & (x['rating'] <= rating_range[1])]
    ans = x.groupby('title').agg({'rating':[np.mean]}).
 ↪sort_values(by=[('rating', 'mean')], ascending=False)
    return ans

p5 = part5("Action", [2,4])
p5
```

[34]:

title	rating mean
Target (1995)	4.000000
Heaven's Burning (1997)	4.000000
Condition Red (1995)	4.000000
Stranger, The (1994)	4.000000
Tokyo Fist (1995)	4.000000
…	…
Turbo: A Power Rangers Movie (1997)	2.272727
Best of the Best 3: No Turning Back (1995)	2.222222
Shopping (1994)	2.200000
Time Tracers (1995)	2.000000
Detroit 9000 (1973)	2.000000

[495 rows x 1 columns]

QUESTION-6:

Presenting a plot using the dataset.

[24]:
```
# Expanding upon the 4th question, we calculate average ratings all the genres␣
 ↪over the eras and see how they
# performed and how the people's movie tastes change.
plot_data = {}
for era in ['197', '198', '199', '200']:
    years = str(int(era)*10)+"s"
    x = merged[merged['year'].str.contains(era)]
    for genre in genres_list:
        temp = x[x['genres'].str.contains(genre)]
        if years not in plot_data:
            plot_data[years] = [temp['rating'].mean()]
        else:
            plot_data[years].append(temp['rating'].mean())

plot_data_df = pd.DataFrame(index=genres_list, data=plot_data)
plot_data_df.fillna(0, inplace=True)
print(plot_data_df)
```

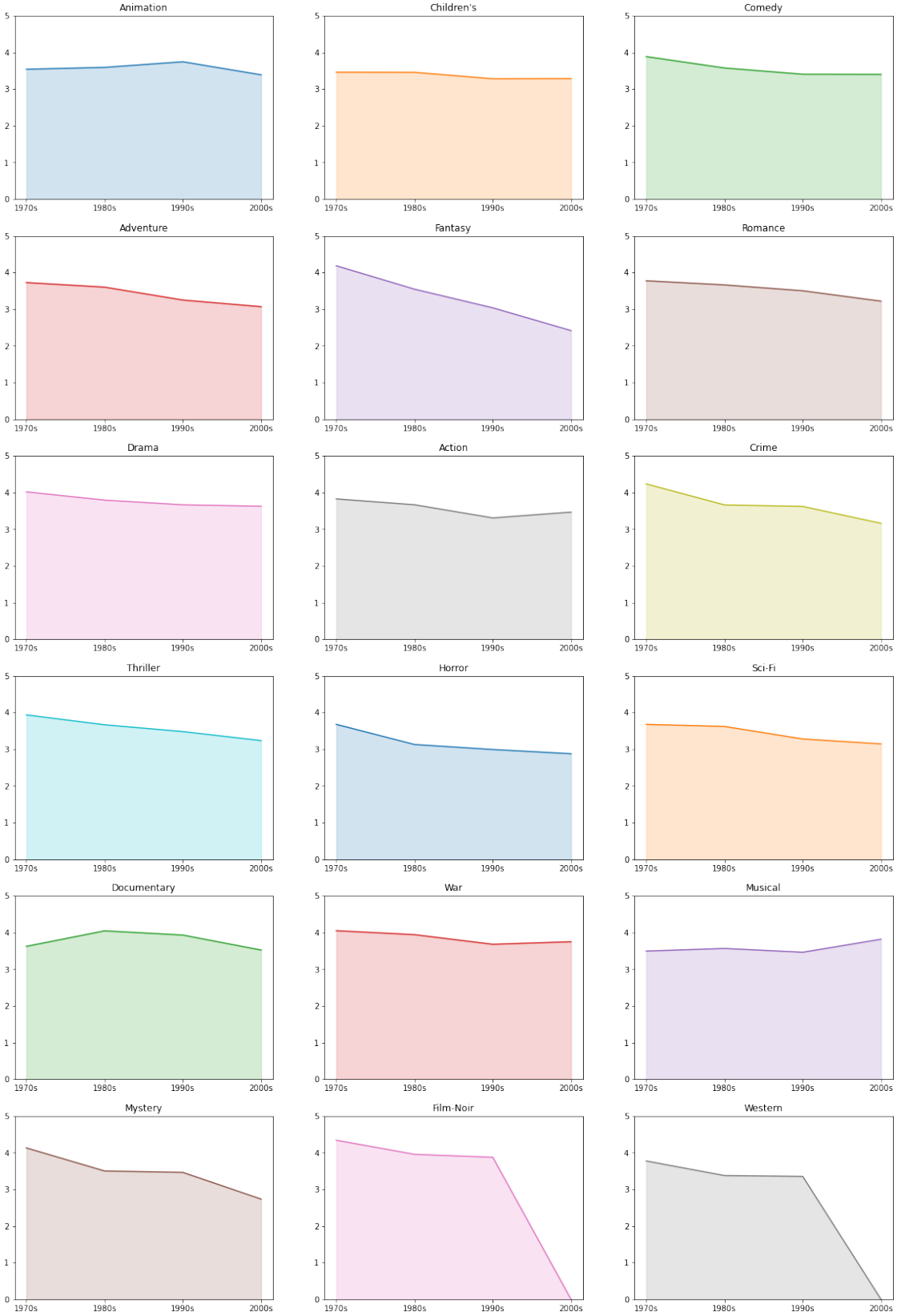
	1970s	1980s	1990s	2000s
Animation	3.540103	3.591174	3.743986	3.388091
Children's	3.460241	3.455690	3.279811	3.284507
Comedy	3.885272	3.574683	3.404012	3.400387
Adventure	3.723703	3.599169	3.247514	3.066234
Fantasy	4.181633	3.543659	3.034932	2.414815
Romance	3.772608	3.660163	3.500348	3.216760
Drama	4.017184	3.791765	3.664912	3.625823
Action	3.824759	3.665287	3.307267	3.465275
Crime	4.233915	3.661715	3.620257	3.159375

```
Thriller     3.936182  3.666712  3.480683  3.235872
Horror       3.677649  3.128832  2.992083  2.876956
Sci-Fi       3.677091  3.620464  3.279957  3.145584
Documentary  3.625000  4.047778  3.933043  3.523697
War          4.051461  3.944061  3.681362  3.750955
Musical      3.495520  3.568041  3.463350  3.820000
Mystery      4.129243  3.500406  3.461807  2.733102
Film-Noir    4.339241  3.954225  3.873613  0.000000
Western      3.773097  3.375606  3.351640  0.000000
```

[26]:
```
columns = ['1970s', '1980s', '1990s', '2000s']

fig = plt.figure(figsize=(20,30))
colors = plt.rcParams["axes.prop_cycle"]()

for i, (name, row) in enumerate(plot_data_df.iterrows()):
    ax = plt.subplot(6,3, i+1)
    c = next(colors)["color"]
    ax.set_title(name)
    ax.set_aspect('auto')
    ax.set_ylim([0.0, 5.00])
    ax.set_ybound(lower=0.0, upper=5.00)
    ax.fill_between(columns, row, alpha=0.2, color=c)
    ax.plot(columns, row, color=c)
plt.show()
```


Animation
Children's
Comedy
Adventure
Fantasy
Romance
Drama
Action
Crime
Thriller
Horror
Sci-Fi
Documentary
War
Musical
Mystery
Film-Noir
Western
0
1
2
3
4
5
1970s
1980s
1990s
2000s

Interesting OBSERVATION:

As the eras progressed, the ratings of most of the genres has decreased. While some genres saw a more decrease than the others, some genres like Children's, Comedy, Action, and Musical saw an upward trend, making them better than ever before.

The reason for this upward trend in my opinion for these genres is because of the rise of animation studios like Pixar, rising popularity for situation comedy/sit-com, and the popularity of some movie franchises like Die Hard, Mission Impossible, and more.