

DSCI 1412 Project Report

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Introduction

Art has always been one of the most important parts of the Egyptian culture. With the evolution of technology, media has also evolved greatly to contain various forms of this art. Egypt is known as a hub for art, where productions of great significance have emerged throughout the years. That being said, it is important to analyze these media trends in Egypt and to explore them using graphical and statistical tools.

Our data is obtained from the website “Elcinema.com” in accordance with their terms and conditions. It contains details of 3762 world of media, with their year of production, media type, genre and title. The data is collected between the years of 2000 and 2020. Through data cleaning and plotting, displayed below, we were able to see trends and analyze some things about the data.

Before looking into the data, one must observe the context of the years that it has been taken from. A few significant years that might affect the production of media would be 2001, 2011 and 2020. In 2001, the 9/11 attacks took place in the US, which does not directly affect Egypt, but it affects the middle east as a whole and how the outside world perceives Arabs. As a result of the attack, the media productions or types in 2002 might be also affected. In 2011, the 25 January Revolution took place in Egypt, which potentially could be a huge hindrance to the media in Egypt as the entire country was unstable. The years that followed were also unstable and it would make sense to see an increase in the number of documentaries for example. In 2020 the COVID-19 virus hit, which resulted in the whole world taking a break and quarantining at home. It would be expectant to see a decrease in the number and types of media productions during that year as the entire world was on hold. These are a few years that we pinpointed before we started analyzing our data, to refer to if we see anything unusual as we proceed.

Aside from the historical events that changed the world's perceptions of the Middle Eastern world and the revolutions in Egypt, the local media industry has also been affected by the Egyptian government itself. The Egyptian government plays a vital role in the lack of development in the media industry by its

intense censorship over the material. In fear of disrespecting their religious beliefs, abandoning social norms, and starting new propaganda against the government, Egypt continues to have strong censorship over its local media industry, thus limiting what might develop and advance into a more significant sector. While series like “El Ekhteyar,” Ramadan TV documentary describing the history of the revolution in Egypt gains immense population in the shortest amount of time, plays like ‘The Body Guard’ is held back from Airing on TV for years. The bodyguard is a plea that might be seen as socially unacceptable and not adhering to the Egyptian social norms, even though it was just a play about two men escaping from a prison. Media censorship is a crucial setback for the advancement of the Egyptian media industry. In this paper, the production of many media types in certain years or especially low due to the censorship it has to abide by. Hence, limiting the scope of imagination for the media industry in Egypt.

Discussion

I. Media Types:

Looking at the media types in general we can find from the following graphs and table A1:

- There are 14 media types in the dataset which are (series, movie, program, play, short, radio, sitcom, cartoon, tv, documentary, mini, riddles, seven, and opera).
- Series media type is the most common type of media produced from 2000 to 2020.
- Opera media type is the least common type of media produced from 2000 to 2020.

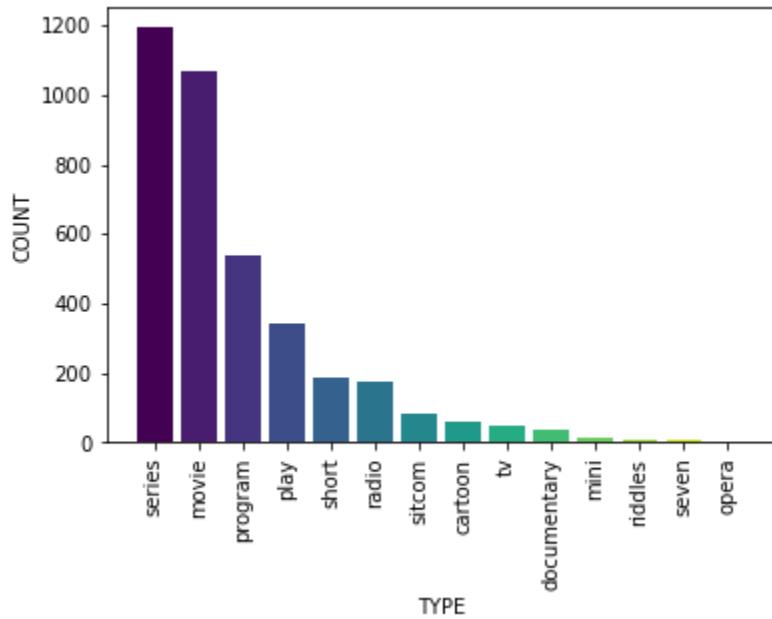


Figure 1: Bar plot of the counts of all media types from 2000-2020

As shown in Figure 1, the most common media type is series, with around 1200 instances in 3761 works (31.7%, see Figure A1), and a close second is movies (28.3%). The number of programs, plays, shorts, and radio shows produced are also significant, while the number of all remaining media types is relatively small. This is an expected result, as elCinema.com is concerned with “cinema, theatre & TV in Arabic”, and so series, movies, and TV programs would be the most common media types under these categories.

As for the less popular types, some examination of the specific works that fall under these categories indicates that some of them may be grouped under other categories. For instance, only six works fall under the type “seven” (a translation of سباعية -- a 7-episode series), which is simply a niche type of “series”. The type “mini”, meaning “mini sitcom”, could be categorized under “sitcom” (which could even further be categorized as “series”). Since there is no specific indication as to how each type is determined (e.g. a work that is actually a “seven” may have just been categorized as a “series”), there is some limitation to the accuracy of this dataset when it comes to media types. Hence, most of the analysis to follow focuses on trends rather than counts.

The following graphs are tackling the details of each media type from 2000 to 2020:

Starting with the first six media types (Series, Movies, Programs, Plays, Short, and Radio)

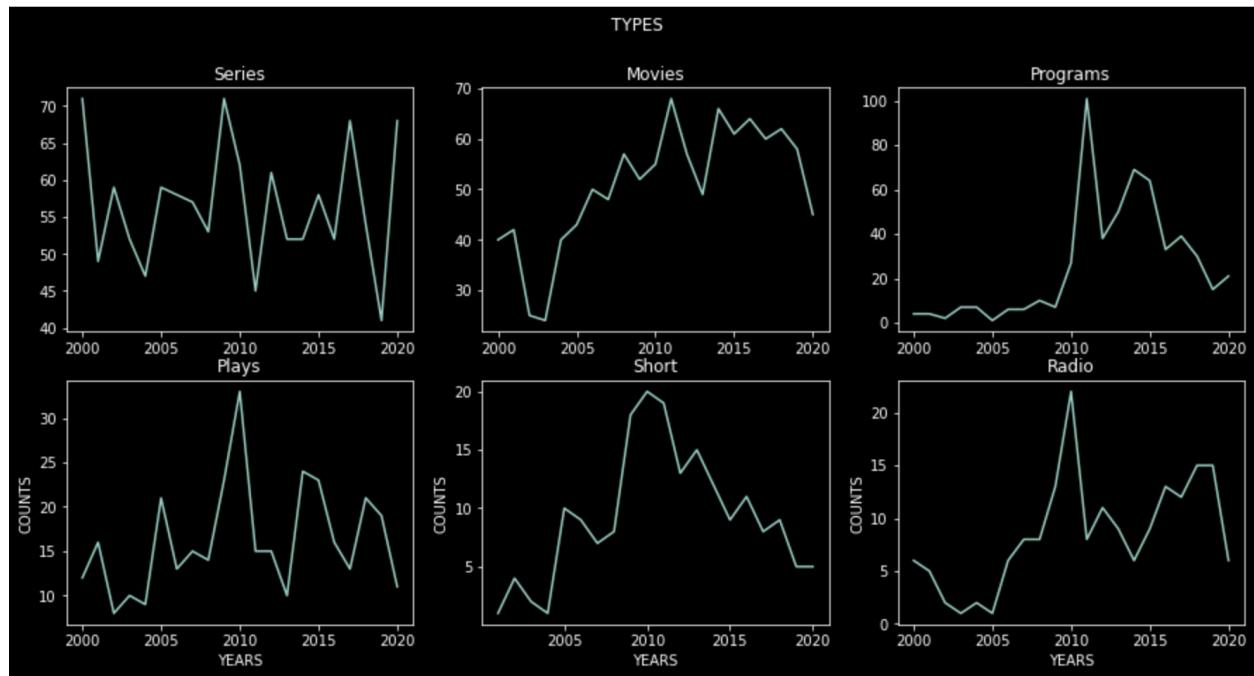


Figure 2

Series media type:

- The number of series produced from 2000 to 2020 keeps significantly decreasing and increasing exchangeably.

- The highest number of series was produced in 2000, 2009, 2017 and 2020.
- The lowest number of series was produced in 2019.
- From 2013 to 2014, the number of the series was nearly constant.

Movies media type:

- The highest number of movies was produced in 2011 and 2014.
- Starting from 2004, there was an obvious increase in the number of the produced movies.

Programs media type:

- The highest number of programs was produced in 2011.
- Starting from 2009, there was a significant increase in the number of the programs, then it slightly decreased after 2011 till 2020.

Plays media type:

- I have five peaks in 2001, 2005, 2010, 2015, and 2017. The highest peak is in 2010.

Short media type:

- From 2000 till 2010, the number of shorts was increasing. On the other hand, from 2010 till 2020, the number of shorts was decreasing.
- The highest number of shorts was produced in 2010.

Radio media type:

- The highest peak occurred in 2010.

- From 2003 till 2005, the number of the produced radio programs was the lowest.

Looking at the graphs of the second six media types (Sitcom, Cartoon, TV, Documentary, Mini, and Riddles), we can see:

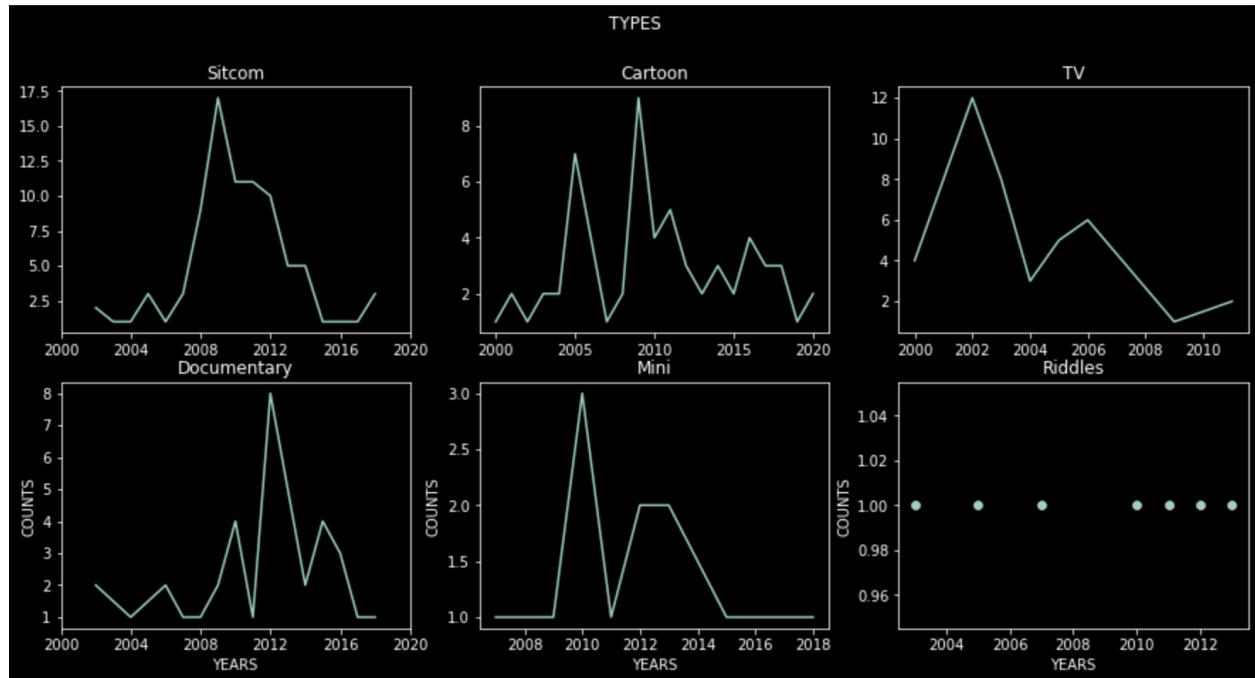


Figure 3

Sitcom media type:

- The number of the produced sitcoms was quite low from 2000 till 2007.
- In 2008, there was an obvious increase in the number of sitcoms.
- Starting from the end of 2008 till 2020, the number of sitcoms significantly decreased again.

Cartoon media type:

- From 2000 till 2004, the number of cartoons produced was quite low.

- Starting from 2004 till 2005, the number of cartoons increased to a significant extent.
- From 2005 till 2007, the number of cartoons sharply decreased.
- From 2007 till the end of 2009, the number of cartoons increased again to an obvious extent.
- From 2009 till 2020, the number of cartoons kept fluctuating slightly.

TV media type:

- Starting from 2000 till 2002, the number of TV shows was increasing till it reached its peak in 2002.
- 2004, 2006, and 2009 are considered as turning points where the number of the TV shows kept increasing and decreasing exchangeably.

Documentary media type:

- There was a slight decrease and increase until 2011.
- In 2012, there was an obvious increase in the number of documentaries, then it decreased again.

Mini media type:

- The number of minis was constant from 2000 till 2009, from 2012 till the end of 2013 and from 2015 till 2018.
- Starting from 2009, the number of the minis sharply increased, then it sharply decreased from 2010 till 2011.
- The number of minis increased again from 2011 till 2012.

- The number of minis decreased after being steady from the end of 2013 till 2015.

Riddles media type:

- The number of the riddles produced were at most once every two years and there is an observed gap from 2007 till 2009.

Last, but not least, we can see from the graphs of the last two media types (Seven, and Opera).

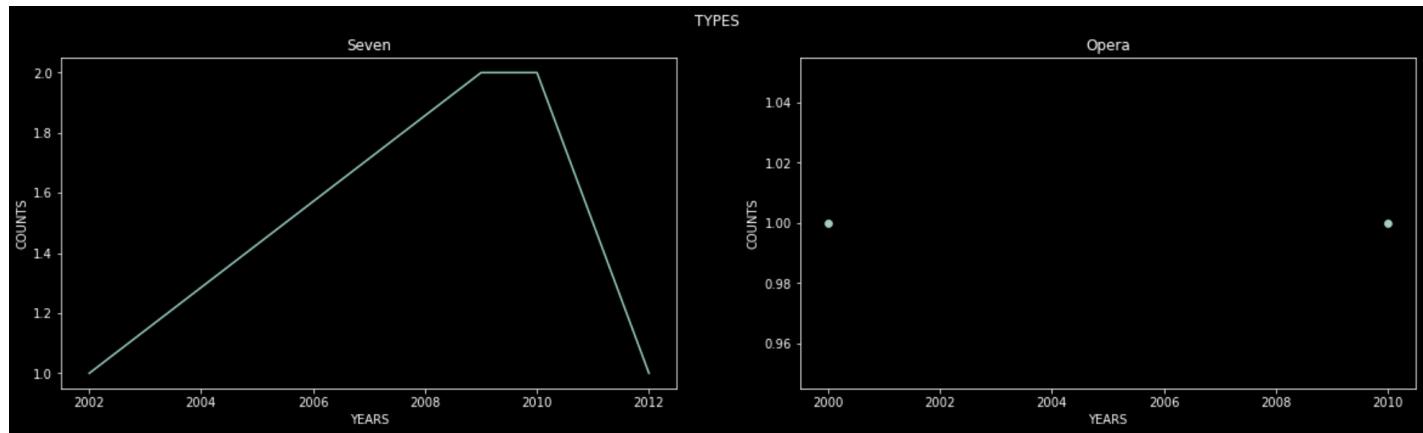


Figure 4

Seven media type:

- The number of sevens was increasing from 2002 till 2009.
- The number of sevens remained steady from 2009 till 2011.
- The number of sevens was decreasing from 2011 till 2012.

Opera media type:

- There are only 2 operas produced from 2000 to 2020. One in 2000 and one in 2010.

Are there any trends among the most common media types in the years 2000-2020?

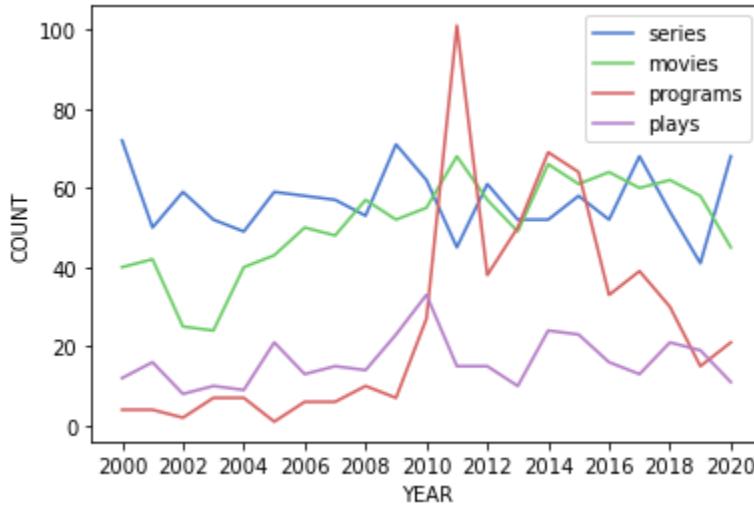


Figure 5: Time series plot of the four most popular media types

Taking a look at Figure 5, which shows the number of each of the four most popular media types produced each year, the most striking feature is the fact that the number of programs produced in 2011 overtakes all other media types. This coincides with the occurrence of the 2011 Revolution in Egypt, a time when people were keen to keep up with current events. Since one method through which this can be done is watching television programs, it may be the case that this increase in TV shows produced is a consequence of this phenomenon. This may however be only a correlation, and no definitive claims can be made. Another observation is that the number of programs in the dataset was relatively low before 2009, while this is not the case for series and movies. One reason for this *may be* the fact that elCinema.com was created in 2008, so the documentation of certain media types may have been lower before 2008, though this may not necessarily apply to series and movies which are well-documented regardless.

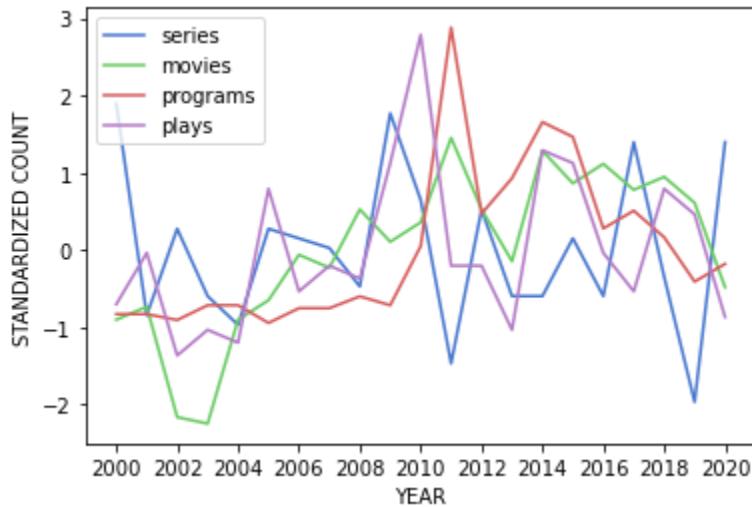


Figure 6: Time series plot of the standardized counts of the four most common media types

To better examine relationships between trends in different media types, we standardized the counts of each media type using z-scores to obtain the graph in Figure 6. Here, it is clear that there was a drop in the number of movies produced in 2002-2003, which can be attributed to the increase in censorship during these two years.¹ The surge in the number of plays in 2009-2010 coincides with the “golden age” of theater,² after which there was a drop that was slightly rectified in 2014-2015 with *Masrah Masr* and similar works. The drop in the number of series in 2019, on the other hand, may be attributed to the increased regulation of the industry.³

Taking a general look at the plot, it is interesting to observe how certain events, such as the 2011 Revolution lead to an increase in the production of some media types and a drop in others. This is very clear by the increase in programs and drop in series, indicating the direction of the Egyptian audiences’ demand and possibly reflecting the role of curfews and political instability

¹ El-Borai, Negad. “The Guillotine and the Pit: Freedom of Expression in Egypt 2002-2003 .” *UG Law*, UG Law, 2004, www.ug-law.com/downloads/the-guillotine-and-the-pit-en.pdf.

² Awad, David. “What’s behind Egyptian Theater’s Revival?” *Al-Monitor*, Al-Monitor, 17 Aug. 2017, www.al-monitor.com/originals/2017/08/egypt-theater-up-for-revival.html.

³ El Banhawy, Yasmin. “Why Is the Egyptian State Monopolizing the Entertainment Industry?” *OpenDemocracy*, OpenDemocracy, 24 June 2019, www.opendemocracy.net/en/north-africa-west-asia/why-egyptian-state-monopolizing-entertainment-industry/.

in hindering such productions. All the aforementioned are simply hypotheses that require further exploration. Alternatively, we observed this inverse relationship in 2002, where the number of series rose as the number of series fell, as producers may have resorted to series to avoid the censorship in the movie industry.

II. Genres:

In order to correctly evaluate the data set, we need to factor in time, and how it affected media production overall. As shown in figure 7, there was a decrease in the overall total number of productions between 2000 and 2003, which could be explained by 9/11 and the increased censorship between those years.

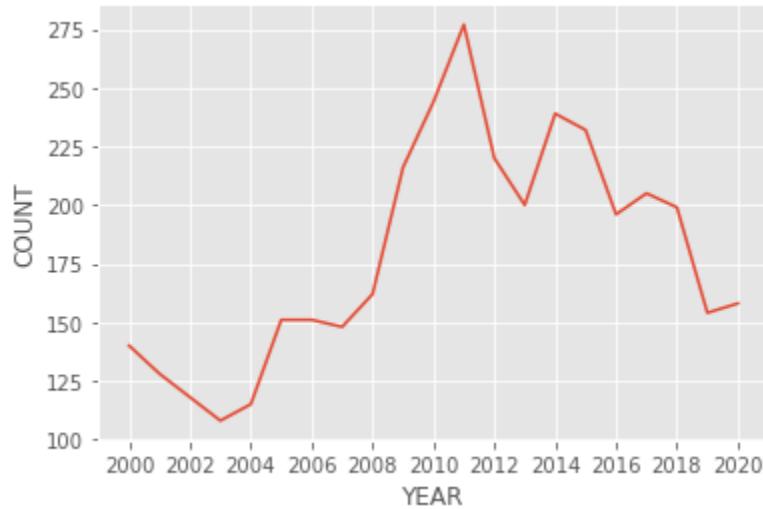


Figure 7

The overall trend seems to be increasing which could be attributed to the general increase of popularity of televisions in the homes of egyptians in the early 2000s and how entertainment was heavily in demand. During 2011, there seems to be a spike in the total number of production. This is suspected to be attributed to the 25 january revolution, and how television programs were

very in demand, as was seen previously. Finally an overall decrease is seen in the last years, with a sharp decrease in the year 2020. The overall decreasing trend started in 2018, which could be directly correlated to the devaluation of the Egyptian pound that took place in 2017, where producers were discouraged to start making more production. The dip in 2020, could be attributed to the COVID-19 virus and how, as mentioned in the introduction, the entire world was quarantined.

This topic requires an in depth exploration of the different genres over time. Figure 8 shows most of the genres graphs, not keeping in mind the most frequently occurring graphs, as you can see, it's very cluttered and difficult to see.

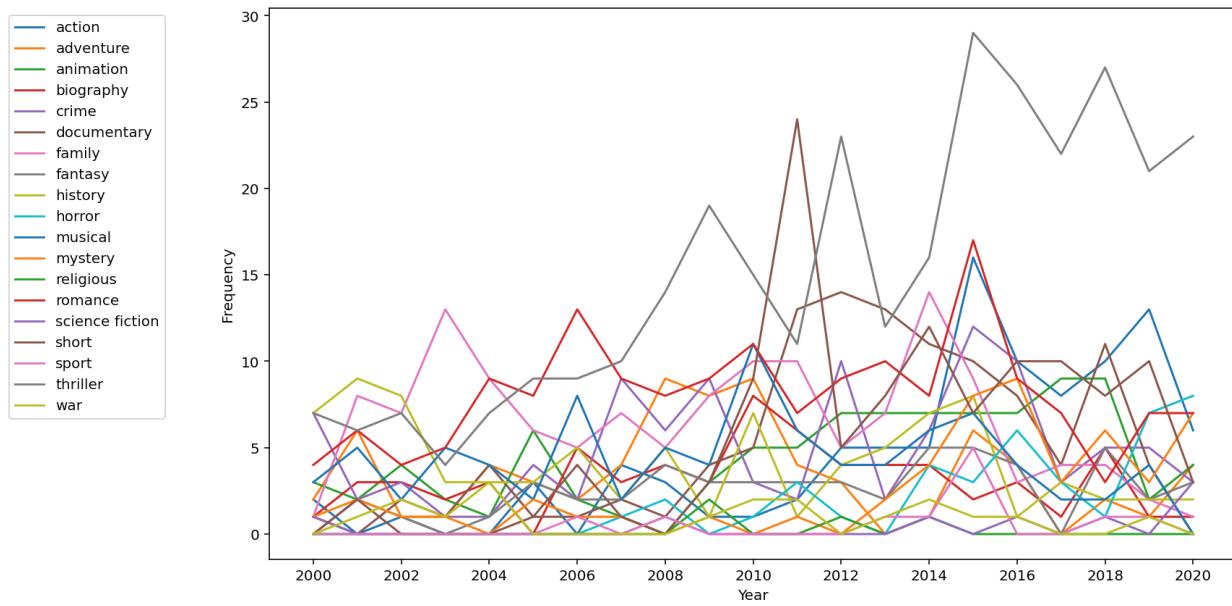


Figure 8

We separated the most frequently occurring genres so that the rest of the data would be visible. The most frequently occurring genres are “none”, “Drama”, and “comedy”; *figure 8* plots them over time. Right away we notice a peak around the time of 2011, which is the time of the revolution. The trend of comedy is increasing over time, as shown in *figure 9*.

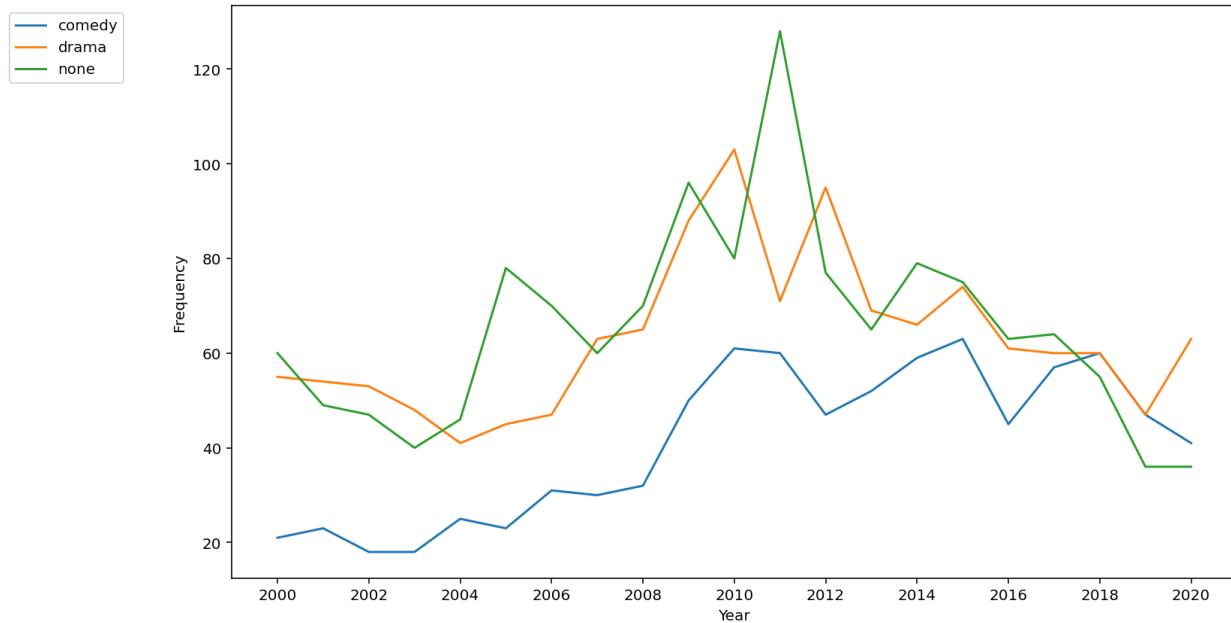


Figure 9

A genre that becomes particularly interesting in figure 8, is thrillers so we decided to plot it in figure 10. right away, it is evident that there is an overall increasing trend. After research, we noticed that in 2014, the thriller movie “The Blue Elephant” was released that sparked a movement of thriller movies in Egypt. Yes, before it there was an increase in the number of thrillers being produced in Egypt, but the sharp increase between 2014 and 2016 must be at least partly attributed to the success that was shown by the movie⁴.

⁴ Egyptian Streets. “The Best Egyptian Films of the 2010s.” *Egyptian Streets*, 27 Dec. 2019, egyptianstreets.com/2019/12/26/the-best-egyptian-films-of-the-decade-the-2010s/.

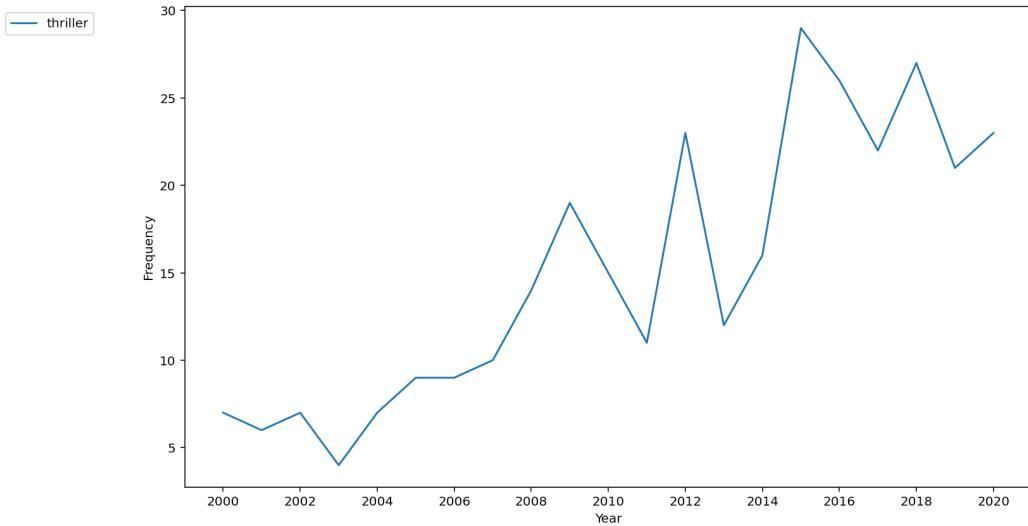


Figure 10

Lastly, the most interesting genres were graphed together in *figure 11*, where we can see the following: documentaries grew in popularity following the revolution and then slowly returned to being unpopular within the Egyptian community. Short movies increased dramatically in numbers in 2011, which is explained by the revolution as well. Finally, romance and crime movies have been fluctuating over the years.

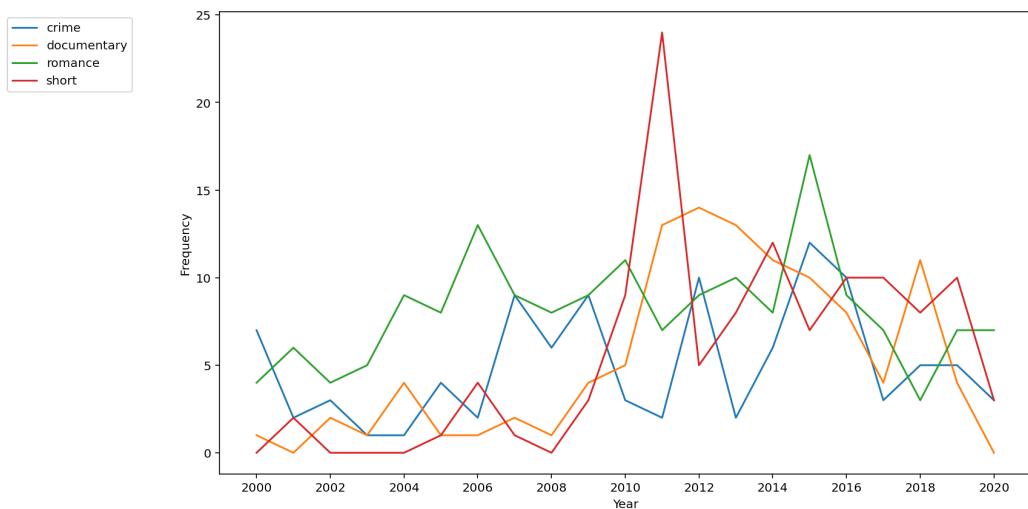


Figure 11

Finally, we could track down the changes and trends of each genre by looking at the changes that happen to it throughout the years. (Refer to Appendix B: Fig 1.1 to Fig 21.2)

III. Missing Data:

Evaluation of missing data per media type

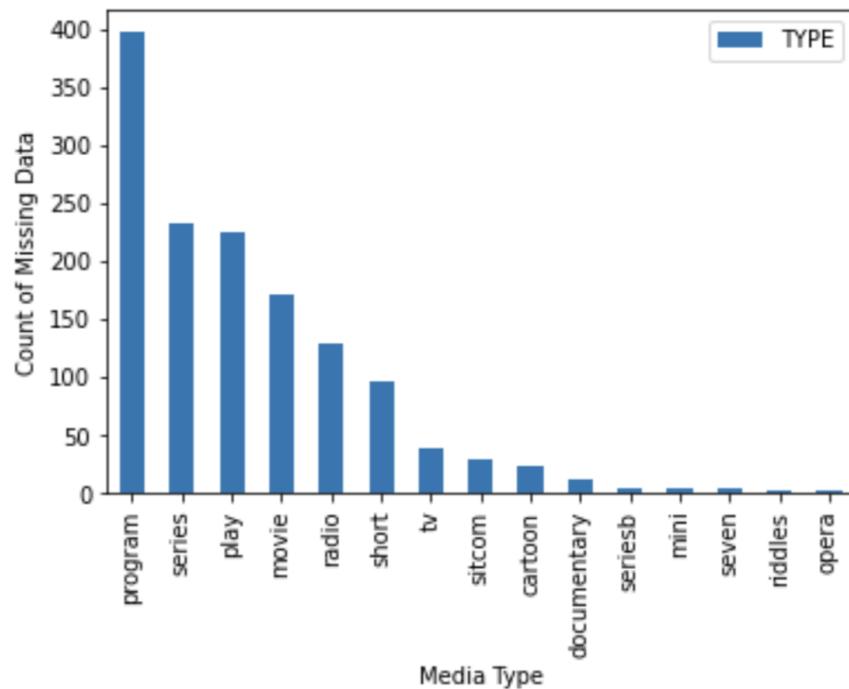


Figure 12

As can be seen from the figure above, the media type ‘program’ has the most significant amount of missing data (397). Following are the series (232), play (226), and movie (172) media types. The media types with the least amount of missing data are riddles (2) and opera (2). In comparison, in figure 1, the most popular media types are also the top four media types with the most significant amount of missing data in figure 12. Correspondingly, the four media types with the least amount of missing data in figure 12 (mini, seven, riddles, opera) are also the least

common media types shown in figure 1. This suggests a direct positive relationship between the popularity of the media type and the amount of the media types' missing data. This might be because there is a lot of data that needs to be collected from many different sources when there is a high quantity of one media type.

Similarly, when there isn't a significant amount of one media type, the corresponding data that needs to be collected will be low and easier to collect. Also, popular media types like programs, series, and movies are most likely to have more than one type of genre. In comparison, other less common media types like opera focus on one type of genre, decreasing the amount of data that needs to be collected.

Conclusion

This report aims to analyze media trends in Egyptian cinema through the ElCinema.com platform. To sum up our findings, it is evident that government censorship, the 2011 revolution, and the depreciation of the Egyptian pound largely impacted the dataset and the trends that followed. The Egyptian government especially played a significant role in affecting these media trends. For example, prevalent government media censorship in 2002-2003 resulted in an evident drop in media production. Moreover, in 2019, the government limited the number of companies that possess the right to produce media, as a way of gaining control over production. In turn, several drops were observed in 2019, including a significant decrease in the number of series produced. The 2011 revolution caused a number of fluctuations. In particular, the number of series produced substantially decreased whereas the number of programs increased. This is due to the fact that, at the time, people were less concerned with entertainment and more concerned with media relevant to current events. Another decline was observed starting 2018, which could

be primarily due to the devaluation of the Egyptian pound, which resulted in the discouragement and inability of filmmakers to produce more movies.

Overall, the most common media types were drama and comedy, which is rather expected of an Egyptian audience, with drama being the genre most likely to be accompanied with another genre. We believe that although we derived several trends and observations from this dataset, it had a few limitations. For instance, the recording methods were not the most accurate, which resulted in a multitude of missing data that we had to denote as “none.” It was apparent that the most common media types were also the most likely to contain missing data, which can be attributed to the large quantity of the data itself which left more room for missing data. There were also translation barriers that were also inconsistent since some movie titles were written in English, others in the Arabic language, and some in Franco-Arabic. However, the obstacles were small in comparison to the information we were able to derive from the dataset.

Contributions

Sana:

Detected and deleted duplicated indices. Replaced “NaN” values in the GENRES column with “none.” Used dummy variables to separate GENRES and create binary columns for each genre separately. Created new “cleaned” data frame. Created a new dataframe that contained the sum of each movie genre by year, which was then used to create time series graphs. Wrote conclusion.

Magdelina:

Wrote the introduction. Created the time series data in genres, along with performing the analysis and corresponding research for the findings .

Ameena:

Created the bar chart and pie chart for all media types and the two time series plots (with multiple lines in the same plot) for media types and wrote the corresponding analysis. Created and analyzed the co-occurrence matrix for genres.

Nermien:

Created the grids for the media types and analyzed each one in detail in the report. Also, created the excel sheet containing most of the python codes taken before. (The link for this excel sheet is in the checkpoint google doc).

Moustafa:

Created the yearly bar charts, pie charts and frequency tables for different genres. Helped in the process of data wrangling; by providing codes that we use to check that we have the right outputs. Contributed in creating the appendices.

Hana:

Contributed in writing the introduction, and wrote the code for the bar chart for missing data and analyzed it.

References

- “2 Easy Ways to Standardize Data in Python for Machine Learning.” *AskPython*, 13 Oct. 2020, www.askpython.com/python/examples/standardize-data-in-python.
- AdithyaAdithya 1, et al. “How to Avoid Overlapping of Labels & Autopct in a Matplotlib Pie Chart?” *Stack Overflow*, 1 Jan. 1963, stackoverflow.com/questions/23577505/how-to-avoid-overlapping-of-labels-autopct-in-a-matplotlib-pie-chart.
- Awad, David. “What's behind Egyptian Theater's Revival?” *Al-Monitor*, Al-Monitor, 17 Aug. 2017, www.al-monitor.com/originals/2017/08/egypt-theater-up-for-revival.html.
- “Bar Plot in Matplotlib.” *GeeksforGeeks*, 4 Mar. 2021, www.geeksforgeeks.org/bar-plot-in-matplotlib/.
- “Combining DataFrames with Pandas.” *Combining DataFrames with Pandas – Data Analysis and Visualization in Python for Ecologists*, datacarpentry.org/python-ecology-lesson/05-merging-data/.
- “Create a Column Using for Loop in Pandas Dataframe.” *GeeksforGeeks*, 8 Jan. 2019, www.geeksforgeeks.org/create-a-column-using-for-loop-in-pandas-dataframe/.
- Egyptian Streets. “The Best Egyptian Films of the 2010s.” *Egyptian Streets*, 27 Dec. 2019, egyptianstreets.com/2019/12/26/the-best-egyptian-films-of-the-decade-the-2010s/.
- El-Borai, Negad. “The Guillotine and the Pit: Freedom of Expression in Egypt 2002-2003 .” *UG Law*, UG Law, 2004, www.ug-law.com/downloads/the-guillotine-and-the-pit-en.pdf.

El Banhawy, Yasmin. "Why Is the Egyptian State Monopolizing the Entertainment Industry?"

OpenDemocracy, OpenDemocracy, 24 June 2019,

www.opendemocracy.net/en/north-africa-west-asia/why-egyptian-state-monopolizing-entertainment-industry/.

Helmut K.Helmut K. 2111 silver badge22 bronze badges, and Celius StingherCelius Stingher 11.9k44

gold badges1212 silver badges3737 bronze badges. "How to Plot Specific Column of Pandas

Dataframe?" *Stack Overflow*, 1 Feb. 1969,

stackoverflow.com/questions/62196649/how-to-plot-specific-column-of-pandas-dataframe.

"How to Transpose a Dataframe in Pandas? - #Hackerday." *DeZyre*,

www.dezyre.com/recipestranspose-dataframe-pandas.

Landup, David. "Change Tick Frequency in Matplotlib." *Stack Abuse*, Stack Abuse,

stackabuse.com/change-tick-frequency-in-matplotlib/.

Mansour-Ille, Dina. (2012). Egyptian Film Censorship: Safeguarding Society, Upholding Taboos.

"Multi-Plot Grid in Seaborn." *GeeksforGeeks*, 16 Mar. 2021,

www.geeksforgeeks.org/multi-plot-grid-in-seaborn/.

"Pandas 0.9.1 Documentation." *Plotting with Matplotlib - Pandas 0.9.1 Documentation*,

pandas.pydata.org/pandas-docs/version/0.9.1/visualization.html.

"Pandas.get_dummies¶." *Pandas.get_dummies - Pandas 1.2.4 Documentation*,

pandas.pydata.org/docs/reference/api/pandas.get_dummies.html.

RuiRui 2911 silver badge77 bronze badges, and ImportanceOfBeingErnestImportanceOfBeingErnest

250k3737 gold badges460460 silver badges516516 bronze badges. "How Could I Get a Different

Pie Chart Color.” *Stack Overflow*, 1 May 1967,

stackoverflow.com/questions/52134364/how-could-i-get-a-different-pie-chart-color.

“Pandas Convert Column with Year Integer to Datetime.” *Stack Overflow*, 1 June 2018,

stackoverflow.com/questions/46658232/pandas-convert-column-with-year-integer-to-datetime.

Shellman, Erin, et al. “Label Axes on Seaborn Barplot.” *Stack Overflow*, 1 Mar. 2016,

stackoverflow.com/questions/31632637/label-axes-on-seaborn-barplot.

“Multi-Plot Grid in Seaborn.” *GeeksforGeeks*, 16 Mar. 2021,

www.geeksforgeeks.org/multi-plot-grid-in-seaborn/.

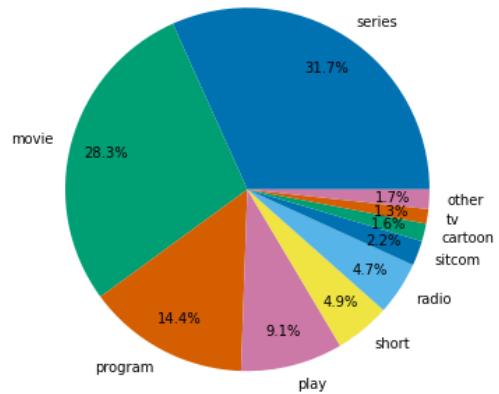
“Combining DataFrames with Pandas.” *Combining DataFrames with Pandas – Data Analysis and*

Visualization in Python for Ecologists,

datacarpentry.org/python-ecology-lesson/05-merging-data/.

“Pandas.get_dummies.” *Pandas.get_dummies - Pandas 1.2.4 Documentation*,

pandas.pydata.org/docs/reference/api/pandas.get_dummies.html.

Appendix A:**Figures and Tables for Media Types***Figure A1: Pie chart of media types**Table A1: Counts of each media type*

TYPE	COUNT	
0	series	1193
1	movie	1066
2	program	541
3	play	341
4	short	185
5	radio	178
6	sitcom	84
7	cartoon	59
8	tv	49
9	documentary	38
10	mini	12
11	riddles	7
12	seven	6
13	opera	2

Appendix B
Yearly Figures and Tables according to Genres

Year	Frequency Table	Bar Chart	Pie Chart																																														
2000	<pre>movies_bygenres2000</pre> <table border="1"> <thead> <tr> <th>GENRES</th> <th>Count</th> </tr> </thead> <tbody> <tr><td>action</td><td>2</td></tr> <tr><td>adventure</td><td>2</td></tr> <tr><td>animation</td><td>3</td></tr> <tr><td>biography</td><td>1</td></tr> <tr><td>comedy</td><td>21</td></tr> <tr><td>crime</td><td>7</td></tr> <tr><td>documentary</td><td>1</td></tr> <tr><td>drama</td><td>55</td></tr> <tr><td>family</td><td>1</td></tr> <tr><td>fantasy</td><td>0</td></tr> <tr><td>history</td><td>7</td></tr> <tr><td>horror</td><td>0</td></tr> <tr><td>musical</td><td>3</td></tr> <tr><td>mystery</td><td>1</td></tr> <tr><td>none</td><td>60</td></tr> <tr><td>religious</td><td>0</td></tr> <tr><td>romance</td><td>4</td></tr> <tr><td>science fiction</td><td>1</td></tr> <tr><td>short</td><td>0</td></tr> <tr><td>sport</td><td>0</td></tr> <tr><td>thriller</td><td>7</td></tr> <tr><td>war</td><td>0</td></tr> </tbody> </table>	GENRES	Count	action	2	adventure	2	animation	3	biography	1	comedy	21	crime	7	documentary	1	drama	55	family	1	fantasy	0	history	7	horror	0	musical	3	mystery	1	none	60	religious	0	romance	4	science fiction	1	short	0	sport	0	thriller	7	war	0	<p style="text-align: center;">Bar Chart for the year 2000</p> <p style="text-align: center;">Fig 1.1</p>	<p style="text-align: center;">pie chart for genres in the year 2000</p> <p style="text-align: center;">Fig 1.2</p>
GENRES	Count																																																
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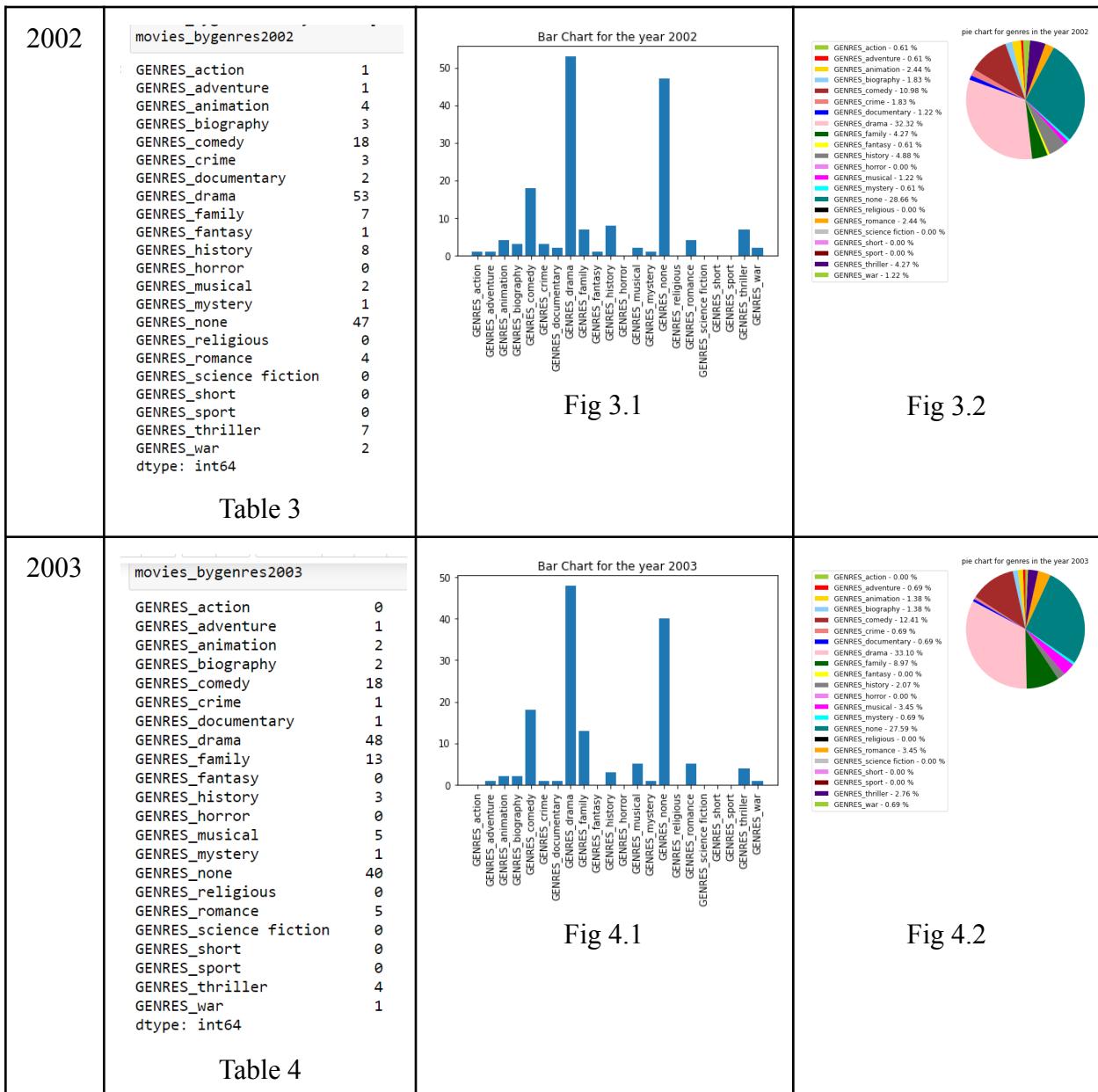


Table 3

Table 4

Fig 3.1

Fig 3.2

Fig 4.1

Fig 4.2

2004

movies_bygenres2004

GENRES_action	0
GENRES_adventure	4
GENRES_animation	1
GENRES_biography	3
GENRES_comedy	25
GENRES_crime	1
GENRES_documentary	4
GENRES_drama	41
GENRES_family	9
GENRES_fantasy	1
GENRES_history	3
GENRES_horror	0
GENRES_musical	4
GENRES_mystery	0
GENRES_none	46
GENRES_religious	0
GENRES_romance	9
GENRES_science fiction	0
GENRES_short	0
GENRES_sport	0
GENRES_thriller	7
GENRES_war	3
dtype: int64	

Table 5

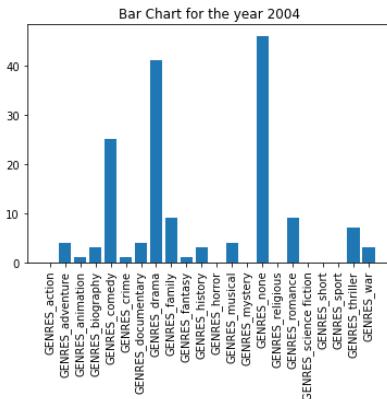


Fig 5.1

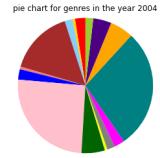


Fig 5.2

2005

movies_bygenres2005

GENRES_action	3
GENRES_adventure	3
GENRES_animation	6
GENRES_biography	0
GENRES_comedy	23
GENRES_crime	4
GENRES_documentary	1
GENRES_drama	45
GENRES_family	6
GENRES_fantasy	3
GENRES_history	3
GENRES_horror	0
GENRES_musical	2
GENRES_mystery	2
GENRES_none	78
GENRES_religious	0
GENRES_romance	8
GENRES_science fiction	0
GENRES_short	1
GENRES_sport	0
GENRES_thriller	9
GENRES_war	0
dtype: int64	

Table 6

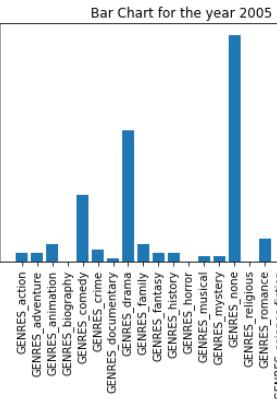


Fig 6.1

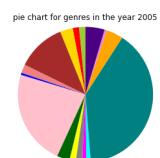


Fig 6.2

2006

movies_bygenres2006

GENRES_action	0
GENRES_adventure	2
GENRES_animation	2
GENRES_biography	5
GENRES_comedy	31
GENRES_crime	2
GENRES_documentary	1
GENRES_drama	47
GENRES_family	5
GENRES_fantasy	2
GENRES_history	5
GENRES_horror	0
GENRES_musical	8
GENRES_mystery	1
GENRES_none	70
GENRES_religious	0
GENRES_romance	13
GENRES_science fiction	0
GENRES_short	4
GENRES_sport	1
GENRES_thriller	9
GENRES_war	0
dtype: int64	

Table 7

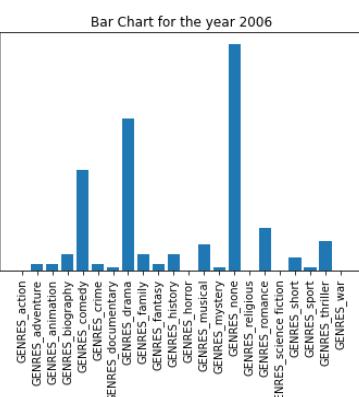


Fig 7.1



Fig 7.2

2007	<pre>movies_bygenres2007</pre> <table border="1"> <thead> <tr><th>GENRES</th><th>Count</th></tr> </thead> <tbody> <tr><td>action</td><td>4</td></tr> <tr><td>adventure</td><td>4</td></tr> <tr><td>animation</td><td>1</td></tr> <tr><td>biography</td><td>3</td></tr> <tr><td>comedy</td><td>30</td></tr> <tr><td>crime</td><td>9</td></tr> <tr><td>documentary</td><td>2</td></tr> <tr><td>drama</td><td>63</td></tr> <tr><td>family</td><td>7</td></tr> <tr><td>fantasy</td><td>2</td></tr> <tr><td>history</td><td>2</td></tr> <tr><td>horror</td><td>1</td></tr> <tr><td>musical</td><td>2</td></tr> <tr><td>mystery</td><td>1</td></tr> <tr><td>none</td><td>60</td></tr> <tr><td>religious</td><td>0</td></tr> <tr><td>romance</td><td>9</td></tr> <tr><td>science fiction</td><td>0</td></tr> <tr><td>short</td><td>1</td></tr> <tr><td>sport</td><td>0</td></tr> <tr><td>thriller</td><td>10</td></tr> <tr><td>war</td><td>0</td></tr> </tbody> </table> <p>dtype: int64</p>	GENRES	Count	action	4	adventure	4	animation	1	biography	3	comedy	30	crime	9	documentary	2	drama	63	family	7	fantasy	2	history	2	horror	1	musical	2	mystery	1	none	60	religious	0	romance	9	science fiction	0	short	1	sport	0	thriller	10	war	0	<p>Bar Chart for the year 2007</p> <table border="1"> <thead> <tr><th>Genre</th><th>Count</th></tr> </thead> <tbody> <tr><td>Action</td><td>4</td></tr> <tr><td>Adventure</td><td>4</td></tr> <tr><td>Animation</td><td>1</td></tr> <tr><td>Biography</td><td>3</td></tr> <tr><td>Comedy</td><td>30</td></tr> <tr><td>Crime</td><td>9</td></tr> <tr><td>Documentary</td><td>2</td></tr> <tr><td>Drama</td><td>63</td></tr> <tr><td>Family</td><td>7</td></tr> <tr><td>Fantasy</td><td>2</td></tr> <tr><td>History</td><td>2</td></tr> <tr><td>Horror</td><td>1</td></tr> <tr><td>Musical</td><td>2</td></tr> <tr><td>Mystery</td><td>1</td></tr> <tr><td>None</td><td>60</td></tr> <tr><td>Religious</td><td>0</td></tr> <tr><td>Romance</td><td>9</td></tr> <tr><td>Science Fiction</td><td>0</td></tr> <tr><td>Short</td><td>1</td></tr> <tr><td>Sport</td><td>0</td></tr> <tr><td>Thriller</td><td>10</td></tr> <tr><td>War</td><td>0</td></tr> </tbody> </table>	Genre	Count	Action	4	Adventure	4	Animation	1	Biography	3	Comedy	30	Crime	9	Documentary	2	Drama	63	Family	7	Fantasy	2	History	2	Horror	1	Musical	2	Mystery	1	None	60	Religious	0	Romance	9	Science Fiction	0	Short	1	Sport	0	Thriller	10	War	0	<p>pie chart for genres in the year 2007</p> <table border="1"> <thead> <tr><th>Genre</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>action</td><td>1.90 %</td></tr> <tr><td>adventure</td><td>1.90 %</td></tr> <tr><td>animation</td><td>0.47 %</td></tr> <tr><td>biography</td><td>4.42 %</td></tr> <tr><td>comedy</td><td>4.27 %</td></tr> <tr><td>crime</td><td>4.27 %</td></tr> <tr><td>documentary</td><td>0.95 %</td></tr> <tr><td>drama</td><td>29.86 %</td></tr> <tr><td>family</td><td>3.32 %</td></tr> <tr><td>fantasy</td><td>0.95 %</td></tr> <tr><td>history</td><td>0.95 %</td></tr> <tr><td>horror</td><td>0.95 %</td></tr> <tr><td>musical</td><td>0.95 %</td></tr> <tr><td>mystery</td><td>0.47 %</td></tr> <tr><td>none</td><td>28.44 %</td></tr> <tr><td>religious</td><td>0.00 %</td></tr> <tr><td>romance</td><td>4.27 %</td></tr> <tr><td>science fiction</td><td>0.00 %</td></tr> <tr><td>short</td><td>0.47 %</td></tr> <tr><td>sport</td><td>0.00 %</td></tr> <tr><td>thriller</td><td>4.74 %</td></tr> <tr><td>war</td><td>0.00 %</td></tr> </tbody> </table>	Genre	Percentage	action	1.90 %	adventure	1.90 %	animation	0.47 %	biography	4.42 %	comedy	4.27 %	crime	4.27 %	documentary	0.95 %	drama	29.86 %	family	3.32 %	fantasy	0.95 %	history	0.95 %	horror	0.95 %	musical	0.95 %	mystery	0.47 %	none	28.44 %	religious	0.00 %	romance	4.27 %	science fiction	0.00 %	short	0.47 %	sport	0.00 %	thriller	4.74 %	war	0.00 %
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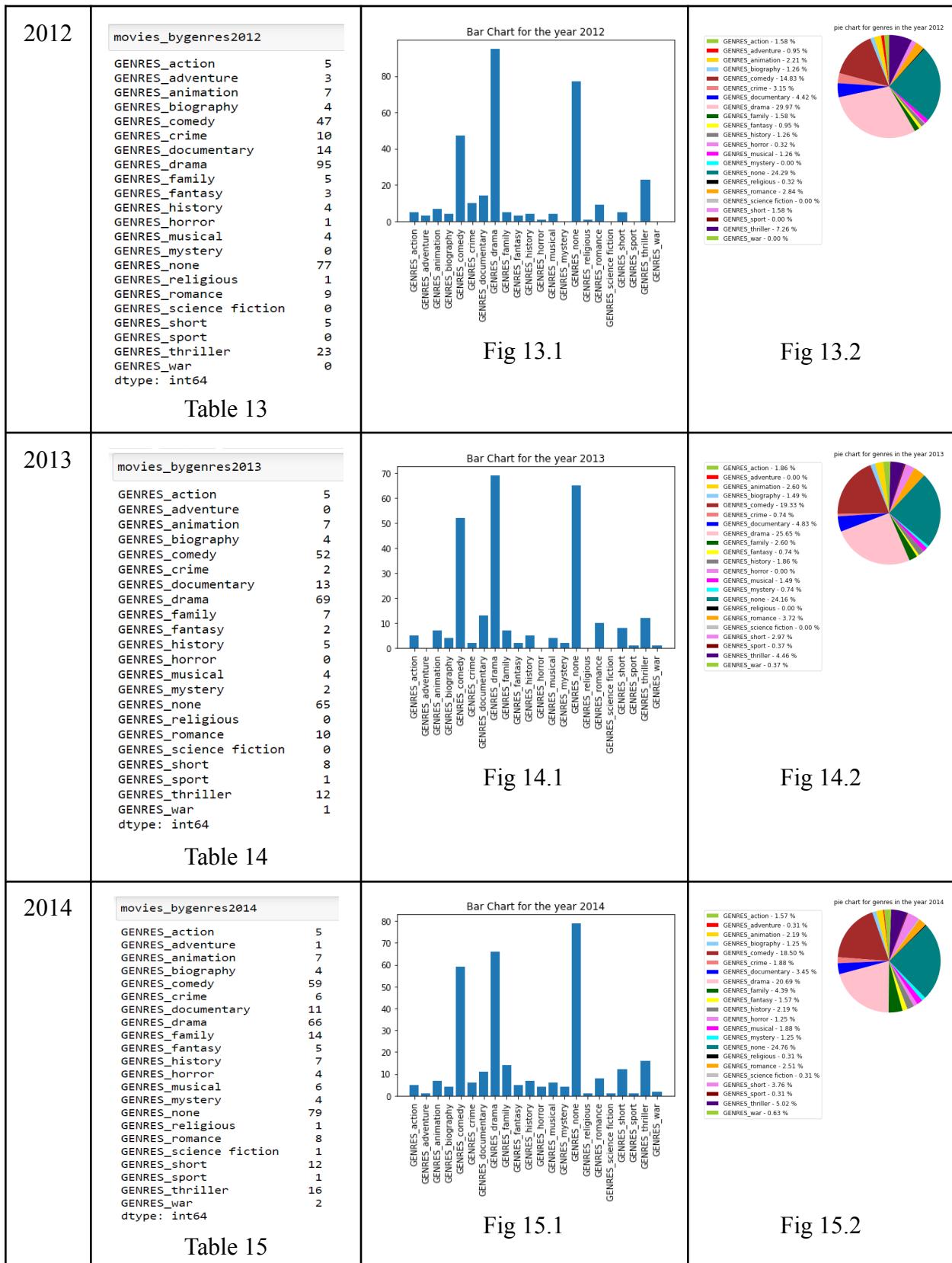
Fig 11.1

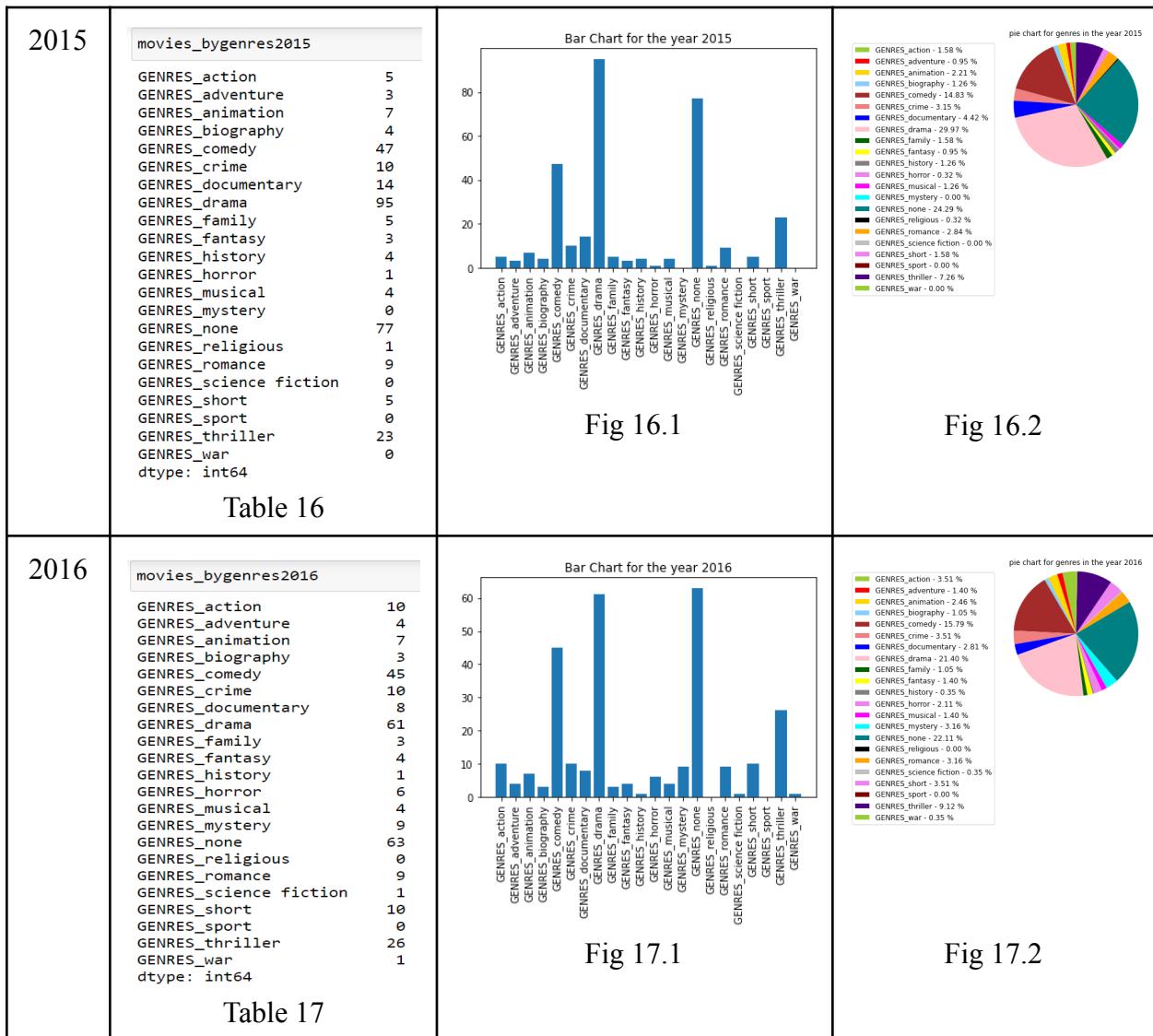
Fig 11.2

Table 12

Fig 12.1

Fig 12.2





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2019

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: movies_bygenres2019
: GENRES_action      13
: GENRES_adventure   1
: GENRES_animation   2
: GENRES_biography   1
: GENRES_comedy      47
: GENRES_crime       5
: GENRES_documentary 4
: GENRES_drama       47
: GENRES_family      2
: GENRES_fantasy     2
: GENRES_history     2
: GENRES_horror      7
: GENRES_musical     4
: GENRES_mystery     3
: GENRES_none        36
: GENRES_religious   0
: GENRES_romance     7
: GENRES_science_fiction 0
: GENRES_short       10
: GENRES_sport        1
: GENRES_thriller    21
: GENRES_war          1
: dtype: int64
```

Table 20

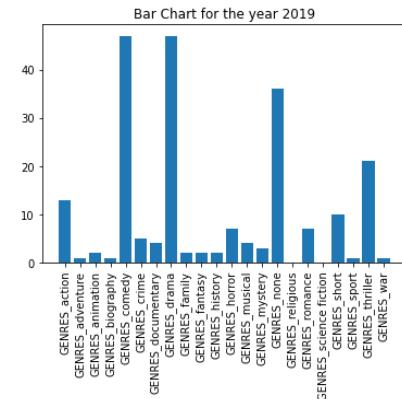


Fig 20.1

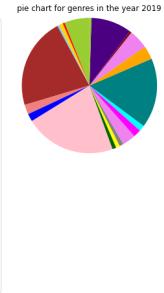


Fig 20.2

2020

```
: movies_bygenres2020
: GENRES_action      6
: GENRES_adventure   4
: GENRES_animation   4
: GENRES_biography   1
: GENRES_comedy      41
: GENRES_crime       3
: GENRES_documentary 0
: GENRES_drama       63
: GENRES_family      1
: GENRES_fantasy     3
: GENRES_history     2
: GENRES_horror      8
: GENRES_musical     0
: GENRES_mystery     7
: GENRES_none        36
: GENRES_religious   0
: GENRES_romance     7
: GENRES_science_fiction 3
: GENRES_short       3
: GENRES_sport        0
: GENRES_thriller    23
: GENRES_war          0
: dtype: int64
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Table 21

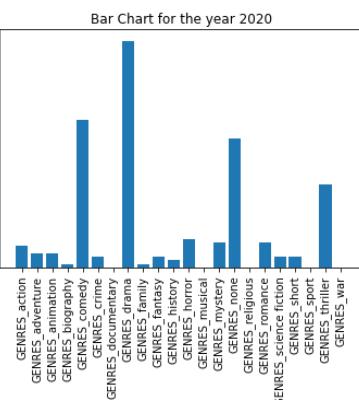


Fig 21.1

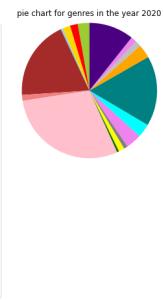


Fig 21.2