# Analysis Report: Identifying Trends in Popular Anime

Date Written: 9/7/23 Link to Original Code Here

## 1. Introduction

### 1.1 Summary

This project is a capstone case study for the Google Data Analytics Certificate. For this particular project, I chose a topic of personal interest and searched Kaggle for a suitable dataset. The following scenario is something I thought of to get the ball rolling.

For this project, we are working as a junior analyst for a hypothetical company that offers online streaming service for popular shows. With the growing popularity of Japanese animation known as anime, the company wants to start including anime in their lineup of shows. However, the company's budget only allows them to purchase the licensing of up to 5 upcoming anime series. The higher up would like a clear understanding of qualities to look for when deciding to purchase the license to an anime. We've been asked to find trends that indicate an anime will be popular and provide a list of recommendations for genre, studios and producers.

Nowadays bidding for an anime license occurs roughly a year in advance and before production even begins. Provided with only a proof of concept and a rough outline of how an anime series may pan out, the higher up need more information before coming to a decision. Since anime bidding are done privately and an anime's public release date can be announced anywhere between a month to a year in advance, we are not informed of which anime is being released for the next season nor what anime are up for bidding as of this writing. The source of our information is here[1].

The company is only interested in a subset of anime that is prevalent in modern media, thus the company would like us to narrow the scope of our search. The following is how we narrow our search:

1. The company is only interested in anime tv series and not other formats like movies. So we will perform our analysis on only anime TV series.
2. The company wants the anime length to be in line with industry standards. As a result we will remove anime with average run time of less than 20 min per episode. We don't want anime with too little episode count nor anime with too many episode counts. So we will only look at anime between 8-60 episodes
3. The company wants to license anime that would be popular in modern day. To handle this, we will use anime made between the years 2015-2020. The year 2021 contains anime still airing so we will exclude it because the data is still incomplete.

[1] Animenewsnetwork.com, a site dedicated to latest update of anime related news

# Analysis Report: Identifying Trends in Popular Anime

Our analysis found which ratings, season length and source material appeals the most to anime watchers. In addition, we compile a list of genres with the best performance along with a couple of red herring genres. The list of studios and producers contain a few prime candidates along with a small collection of alternative studios and producers that also create quality anime.

### 1.2 Questions

1. What is the relationship between an anime's score and viewer interest?
2. What rating and run length is most popular with viewers?
3. Which genres are most popular with viewers?
4. Which studios are most popular with viewers?
5. Which producers are most popular with viewers?
6. What do competitor licensors look for in an anime?
7. What source materials have the most success as anime adaptation?

### 1.3 Outline

Section 2 will discuss the background of the dataset, dataset origin, limitations and cleaning process applied. Section 3 contains our analysis of the question mentioned in Section 1.2. Each subsection of Section 3 discusses the methodology, analysis and conclusion of a single question. Section 4 contains a summary of our new insights, recommendations and new questions to pursue.

## 2. Data

### 2.1 Dataset Used

The dataset, Anime Recommendation Database 2020, is hosted on Kaggle and provided by Hernan Valdivieso. The data was data scraped from Animelist.net, a website users use to catalog their anime interest and rate anime. The dataset was last updated roughly 2 years ago and contains all anime up to the most recent update. We selected this dataset over others found on Kaggle because this dataset provides the most amount of information while being relatively up to date. The dataset can be found here.

For our purposes, we primarily use anime.csv tables provided in the dataset. The anime table contains information on 17562 different anime. The table also provided an anime's average score, genre, episode count, release date, producer, licensor, studio, source, rating, members interested and few other useful info.

### 2.2 Limitations

# Analysis Report: Identifying Trends in Popular Anime

Although the dataset is somewhat recent, it doesn't reflect the improvement/decline of studios and producers in recent times. Oftentimes in the anime community, if an upcoming anime possesses highly praised source material, it is a strong indicator the anime will draw a large amount of attention. This particular factor is not accounted for within the dataset. My Anime List is a site generally used by people who watch plenty of anime, thus reflecting the interest of those people. As a result, although Anime List is probably the most accurate representation of anime watchers, it doesn't encompass the entire sphere of anime watchers.

### 2.3 Licensing & Privacy

This dataset is licensed under CC0: Public Domain thus freely available online for public use. This dataset may be copied, modified and distributed for any purpose without needing attribution or permission. All user personal information is excluded in the dataset.

### 2.4 Summary of Cleaning Process

1. Drop irrelevant/duplicate columns. We kept the columns: MAL_ID, Name, Score, Genres, Type, Episodes, Premiered, Producers, Licensors, Studios, Source, Duration, Rating, Ranked, Popularity, Members and Dropped
2. Convert columns into proper data type and format columns with multiple entries into list
3. Filter out all non-TV series anime
4. Filter out anime that are not 8-60 episodes long
5. Filter out anime that average less than 20 minutes airtime per episodes
6. Split Premiered col into Year and Month col and filter out all anime aired outside of the year 2015-2020
7. Clean up formatting of Rating column
8. Create DropRatio column to measure percentage of people who lost interest
9. Categorize each anime into season length ranging from 1-4 seasons.
10. Keep rows containing at least 3 non-missing entries between columns: Score, Licensors, Studios, Producers, Premiered and Source. Drop other rows
11. For remaining missing data, fill numerical entries with average values and fill categorical entries as Unspecified or Other Studio/Producers, etc.
12. Save the cleaned dataset as a new csv file.

## 3. Analysis

In the dataset, there are two metrics to measure an anime’s popularity, the score column and member column. The score column is an average of every viewer rating for an anime, ranging from 1-10. This roughly translates into viewer satisfaction in an anime. User satisfaction mainly informs us of an anime’s overall quality and future potential adaption or

recommendation. The member column is a count of every user that is/has currently watching, finished, placed on hold, dropped, or plans on watching anime. This measures how much attention an anime has garnered or the collective viewer interest in an anime. Viewer interest will be our primary metric for measuring popularity because more interests mean more users willing to subscribe to a streaming service. Viewer satisfaction is a secondary metric we will use to measure popularity in addition to viewer interest.

### 3.1 Relationship Between Anime Score and Viewer Interest

#### 3.1.1 Method & Analysis

We plotted Scores and Members columns and found a logarithmic function best describes their relationship.

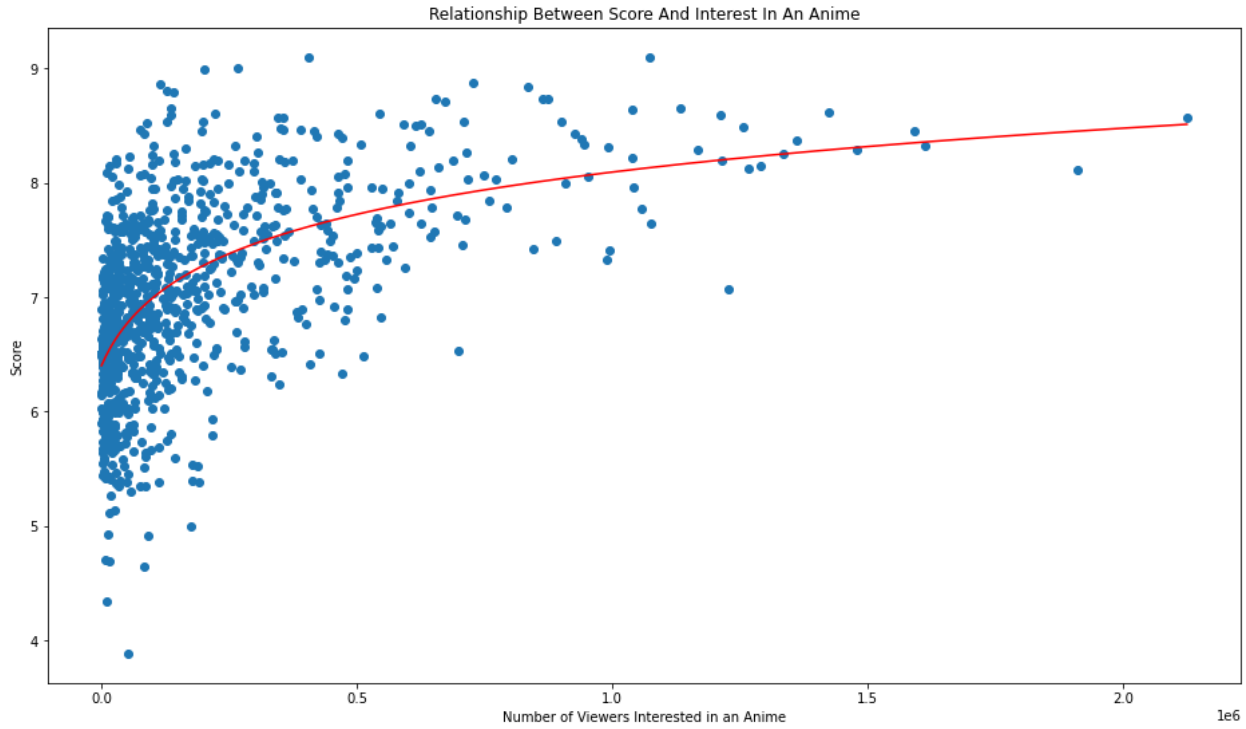


Figure 1

Figure 1 indicates the score will rapidly increase with more viewer interest, eventually hard plateauing as the number of viewers interested in an anime reach relatively high numbers. This means every increment increase of a few thousand viewers will result in a significant score increase and after reaching the 100,000s, there is diminishing return in score per viewer.

Next we decided to see if there is a correlation between an anime drop rate and the score column. We plotted the DropRatio column and Scores and applied a linear regression to the

graph. In figure 2 below, the notable vertical trend is a result of filling missing values with average value.

.

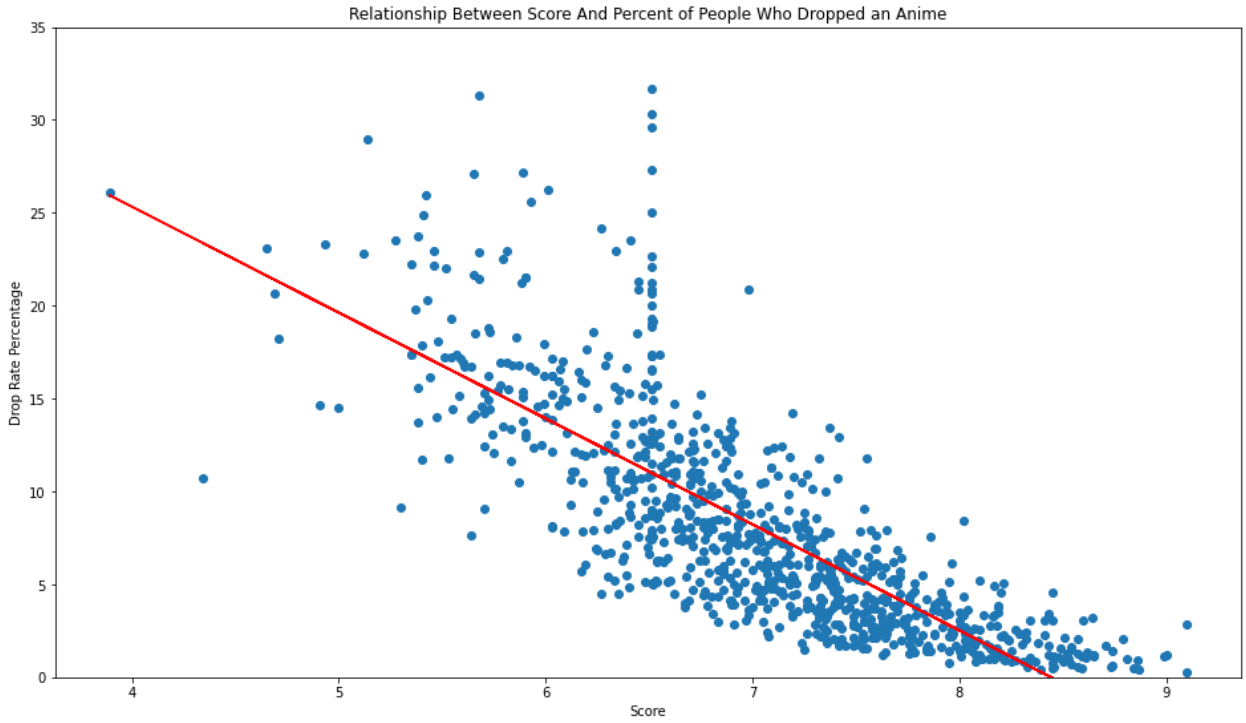


Figure 2

There is an inverse relationship between score and percentage of viewers that loses interest in an anime as shown in Figure 2. Generally, the higher the score, the larger the percentage of the viewer base will remain interested in an anime. Conversely, lower scores means users are more likely to drop an anime mid series.

### 3.1.2 Conclusion

There is a positive logarithm relationship between Score and Viewer Interest in an anime. This means the best bang for buck in terms of Score and Viewer Interest occurs before the 100000s viewer count. Any further will result in a significant diminishing return. Higher score in an anime means less users willing to drop an anime series they started.

## 3.2 Most Popular Rating and Run Length

### 3.2.1 Method & Analysis

We will be using the popularity column to gauge which rating and run length is most popular with viewers. The Popular column ranks anime by the Members column. From our

dataset, we filter out anime that didn't make the top 1000 in popularity. Only 318 of the most popular anime were released between 2015 and 2020. From the 318 anime, we created a heatmap that counts and categorizes each row based on rating and run length.

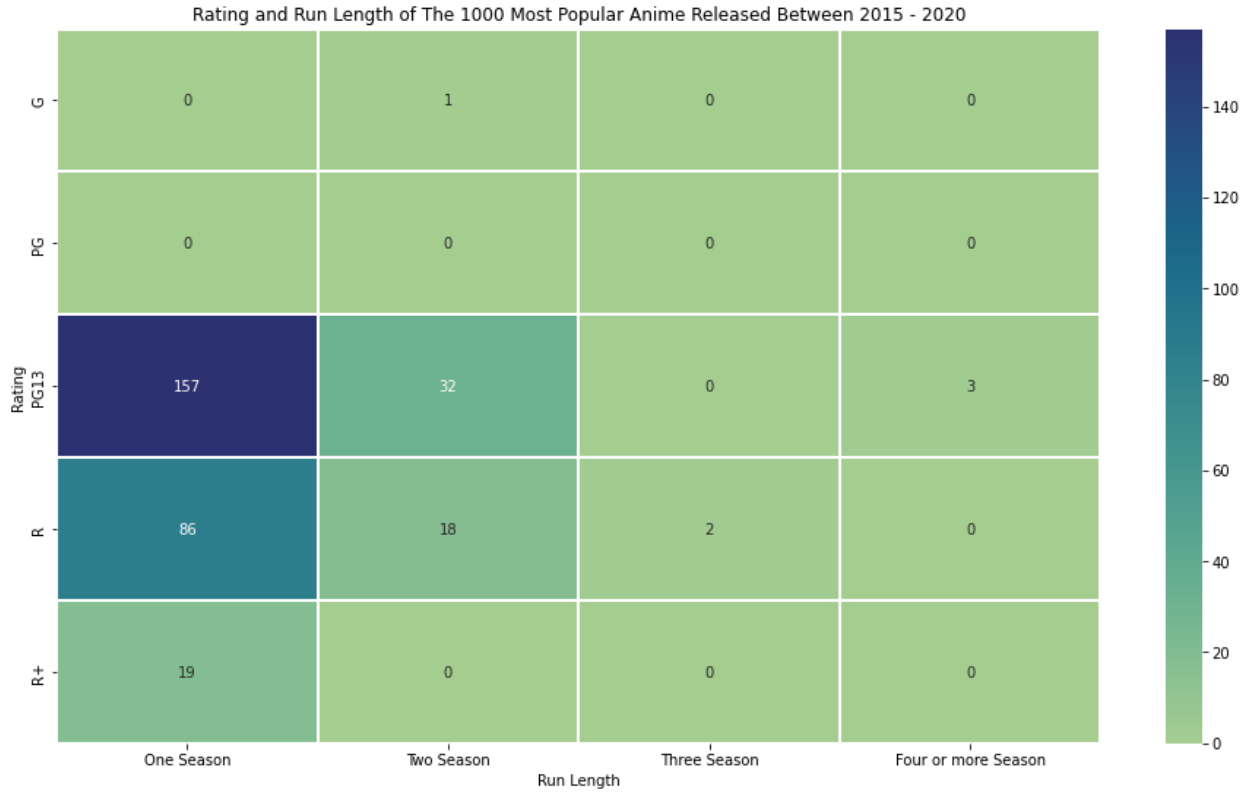


Figure 3

In Figure 3, we see of the 318 anime, the majority are only one season in length with some amount of two seasons. Rarely any anime is three seasons and longer. Anime rated G and PG only made 1 appearance total. This indicates anime watchers are not interested in anime below PG-13. The top three combinations of rating and run length were One Season long anime rated PG-13, One Season long anime rated R, and Two Season long anime rated PG-13.

### 3.2.2 Conclusion

Among the 318 within the top 1000 most popular anime, the most common anime are One Season long anime rated PG-13, One Season long anime rated R, and Two Season long anime rated PG13.

### 3.3 Most Popular Genres

# Analysis Report: Identifying Trends in Popular Anime

### 3.3.1 Method & Analysis

When comparing anime, there are some biases we need to be aware of. Generally older anime have more views because they have been accumulating over time. In addition, older anime are judged less harshly because standards were lower when they premiered. An anime that was considered peak or extremely good for its time may be considered mediocre by today's standards. To circumvent this bias, we compared anime to other anime released in the same season.

For viewer interest, we take the average membership of each genre for one anime season and obtain a list of the top 5 genres of that season. We repeat this process for every anime season between 2015 - 2020 and pool together the results. This gives a count of every time a genre made top 5 in one anime season. If there is a tie for last place, all entries that are tied for last place are included. We selected the top 5 because there are not many genres available to choose from. We will consider genres that appear 5+ times to be successful genres.

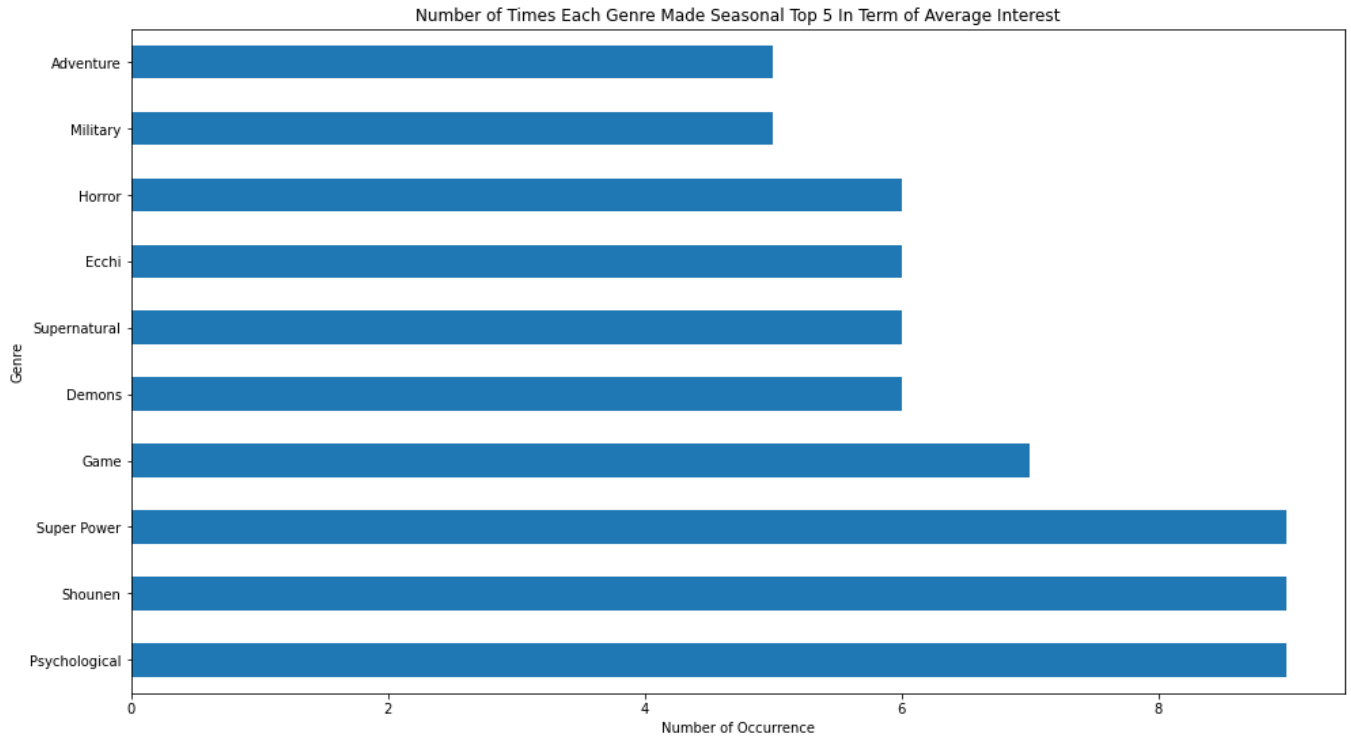


Figure 4

# Analysis Report: Identifying Trends in Popular Anime

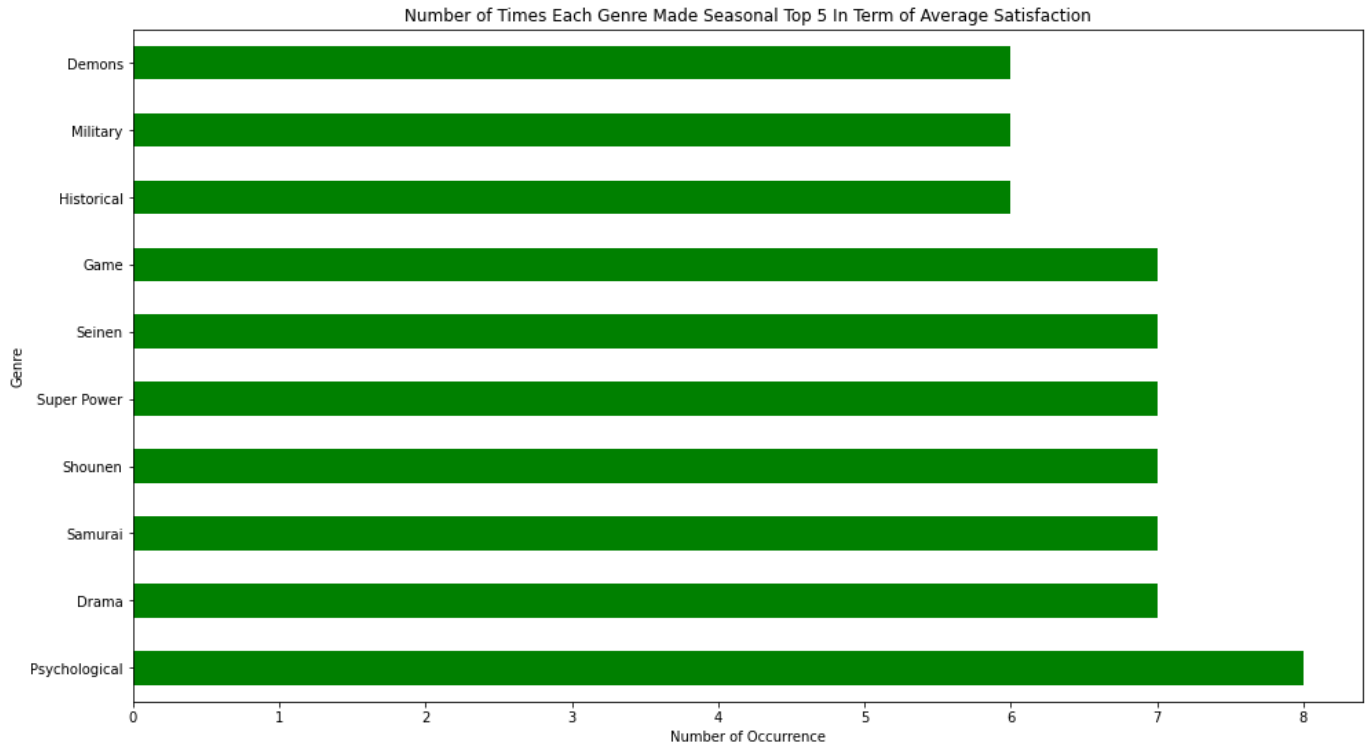


Figure 5

The genre Shounen, Superpower and Psychological are the most successful genres in terms of both viewer interest and satisfaction as seen in figure 4 and figure 5 respectively. The Game and Demon genre are the only other two genres appearing 5+ times in both viewer interest and satisfaction .

### 3.3.2 Conclusion

The trends show the Shounen, Superpower, Psychological, Game and Demon genre have the overall most success and should be given greater consideration.

## 3.4 Most Popular Producers

### 3.4.1 Method & Analysis

In the same vein as our methodology in the most popular genre section, we compared anime to other anime released in the same season. The primary difference in this section is:

- We will be picking from top 8 instead of top 5 because there are significantly more producer than genres available
- Producers will be considered largely successful if they occur 4+ times

# Analysis Report: Identifying Trends in Popular Anime

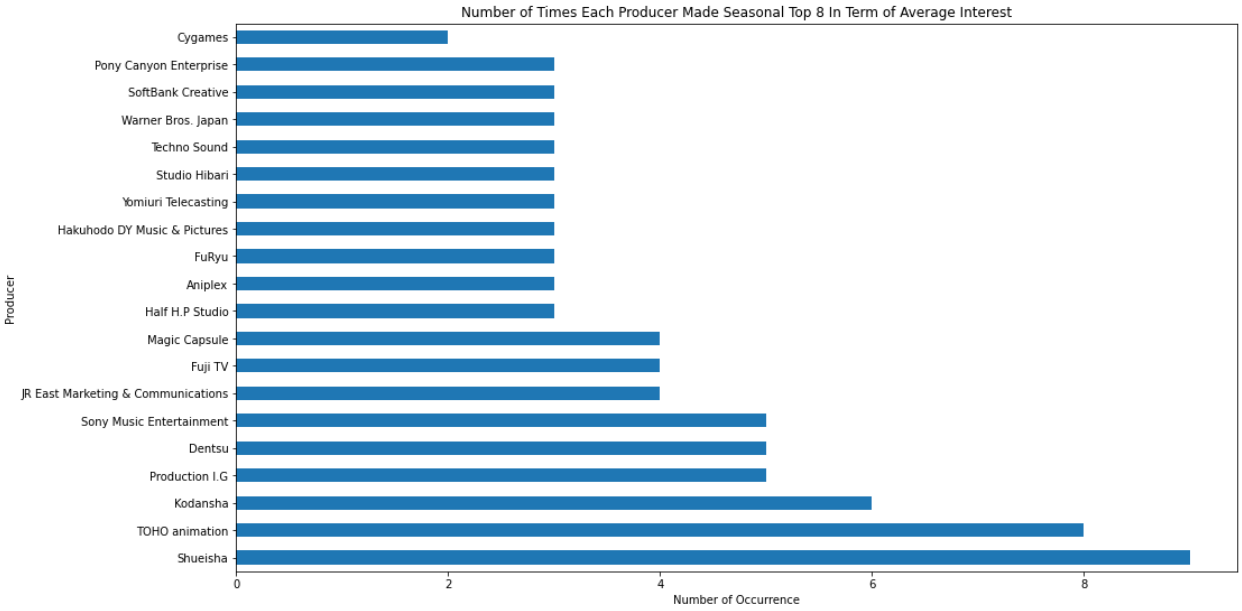


Figure 6

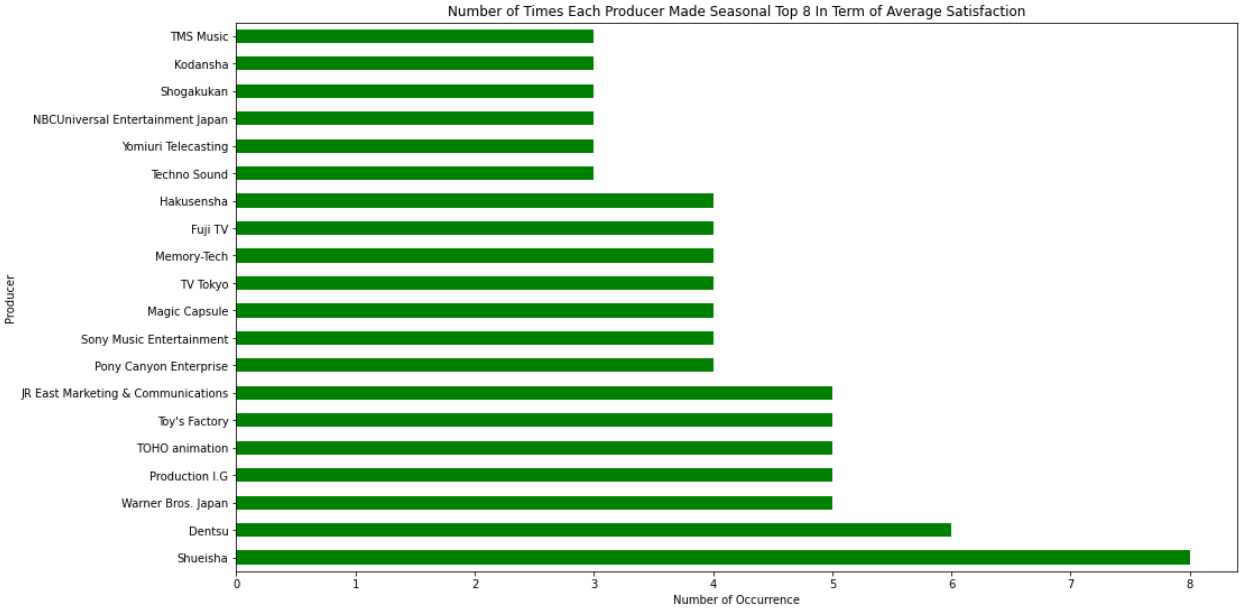


Figure 7

We found Shueisha topped the chart in both viewer interest on Figure 7 and viewer satisfaction on Figure 8 by a significant margin. This is expected because Shueisha publishes many popular manga series. Generally an anime adaption of an extremely popular manga will capture plenty of viewer interest. In addition, a large proportion of the manga reader fan base will watch the adaptation. Dentsu and TOHO Animation performs well by our standards as well. Other producers worth noticing are Production I.G, Sony Music Entertainment and J.R East

Marketing. While a bit below our definition of good, Fuji TV and Magic Capsule is worth some consideration.

### 3.4.2 Conclusion

The trends show Shueisha, Dentsu and TOHO Animations are the producers with the overall most success with special consideration towards Shueisha. Following up in terms of success are producers Production I.G, Sony Music Entertainment, and J.R East Marketing. If none of the previous producers are available Fuji TV and Magic Capsule are worth considering.

## 3.5 Most Popular Studios

### 3.5.1 Method & Analysis

For finding the most popular studio, we will be using the exact same method as Section 3.4 Most Popular Producers. However, there are a few additional biases unique to studios that need to be addressed. This method of studio selection is biased towards studios that produce anime extremely often. Some studios who do great work, but don't output as much anime as other studios will not appear as favorable in comparison to studios that output plenty of anime. One good example is Ufotable, a studio known to produce some of the best industry standard animation available. An example of their work is Demon Slayer.

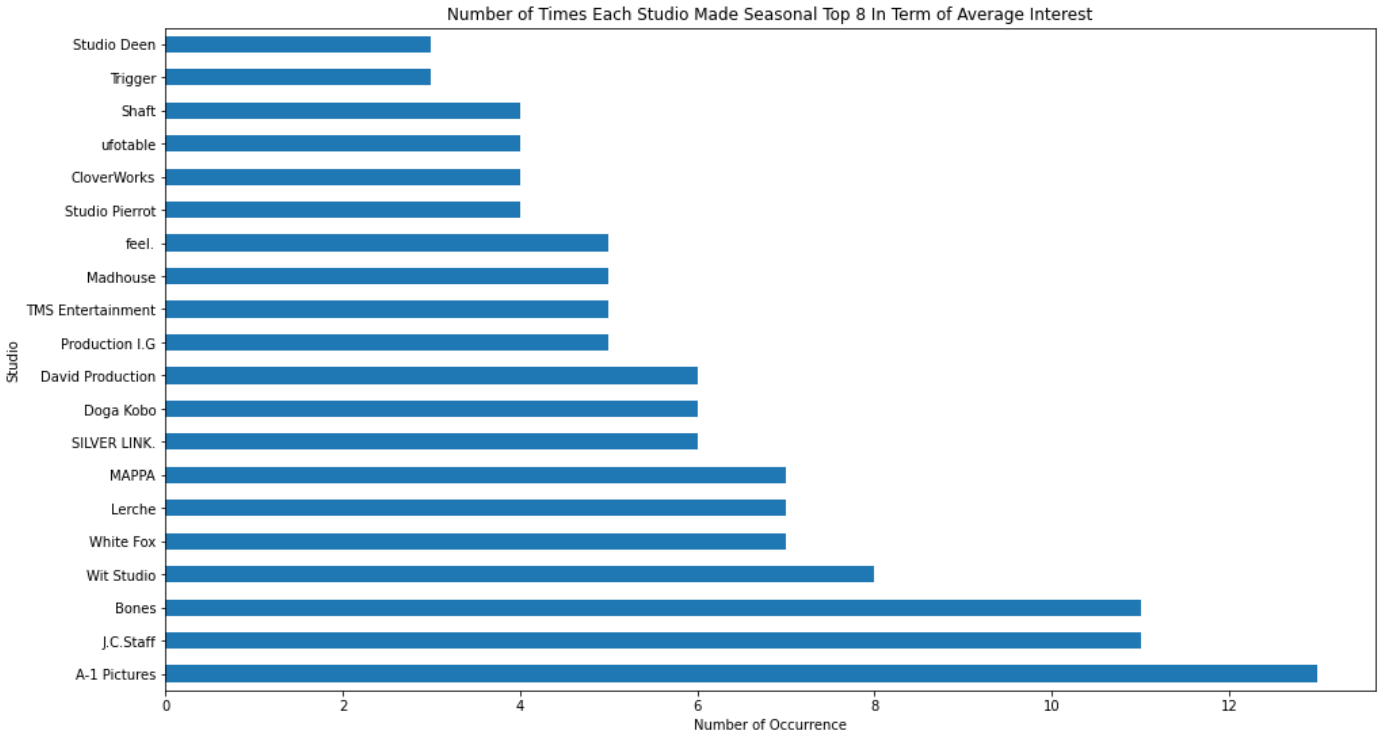


Figure 8

# Analysis Report: Identifying Trends in Popular Anime

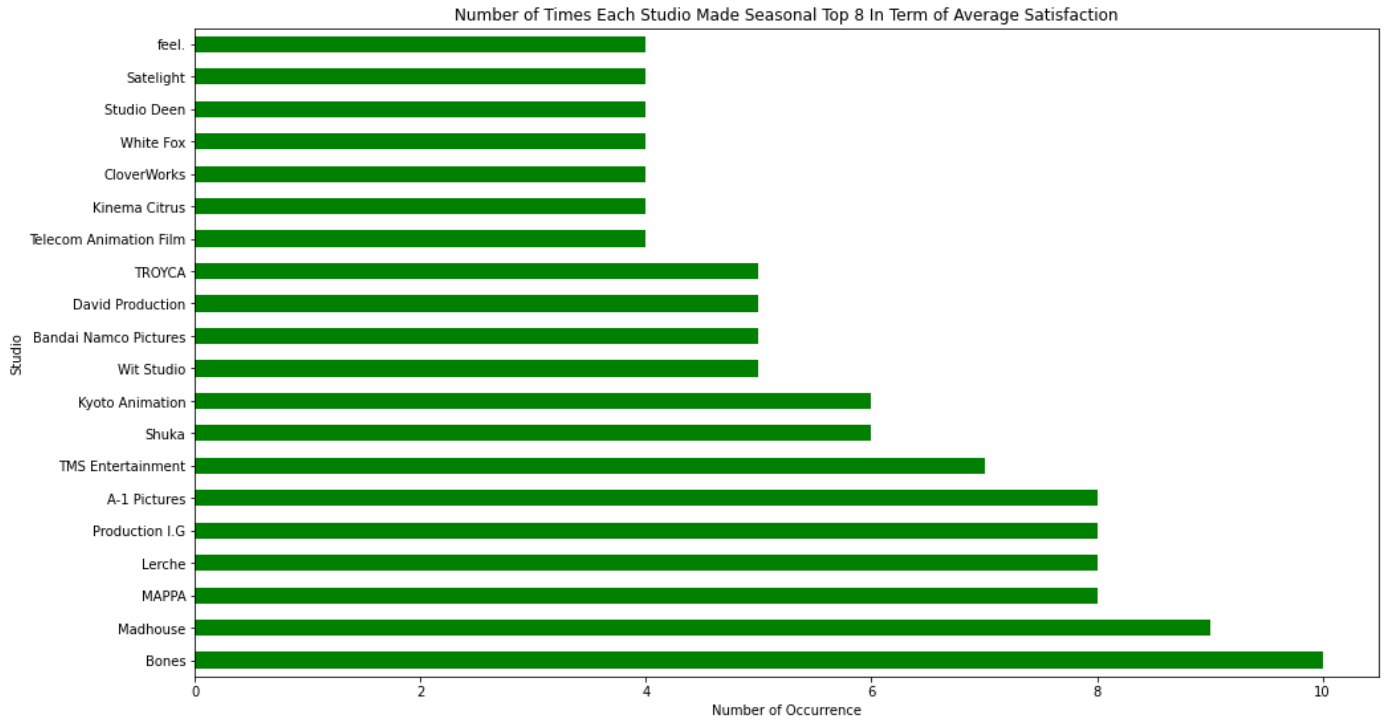


Figure 9

A studio with an occurrence of 5+ in both categories will be considered good. We found A-1 Pictures and Bones to have stellar performance in the viewer interest and viewer satisfaction front, with Lerche and MAPPA following them up in performance. For viewer interest, the following studios: Doga Kobo, David Production, Silver Link, White Fox, Wit Studio and J.C Staff performs well, but below average in viewer satisfaction. On the other hand, in viewer satisfaction, Madhouse, Production I.G , TMS Entertainment, Shuka and Kyoto Animation perform well, but below average in viewer interest.

### 3.5.2 Conclusion

Historical data shows A-1 Pictures, Bones, Lerce and MAPPA have a history of consistently animating popular anime. Other studios worth taking note of are Doga Kobo, David Production, Silver Link, White Fox, Wit Studio, J.C Staff, Madhouse, Production I.G , TMS Entertainment, Shuka and Kyoto Animation.

## 3.5 Trends in Competitors

### 3.5.1 Method & Analysis

# Analysis Report: Identifying Trends in Popular Anime

First for every unique licensor we aggregated the member columns for all anime listed under their name to obtain an average member count. This member count shows the parent company who owns the original license and competing streaming companies who purchased/owned the license. Of these licensors our only competitors are Netflix, Crunchyroll and Funimation. In addition, we took a count of all anime listed under each licensor as License Count. We found Netflix, Crucnhyroll and Funimation have only the license to 5, 54 and 324 respectively as seen in Table 1.

| | Licensors | Avg Members | License Count |
|---|---|---|---|
| 8 | VIZ Media | 426116.50 | 14 |
| 5 | Aniplex of America | 360443.13 | 62 |
| 3 | Crunchyroll | 320901.17 | 54 |
| 7 | Discotek Media | 275293.00 | 12 |
| 2 | Funimation | 244613.23 | 324 |
| 10 | Maiden Japan | 213851.00 | 1 |
| 1 | Sentai Filmworks | 177542.80 | 140 |
| 4 | Netflix | 170989.00 | 5 |
| 6 | Ponycan USA | 117037.84 | 19 |
| 12 | NBCUniversal Entertainment Japan | 100399.00 | 1 |
| 0 | Other Licensors | 89317.94 | 303 |
| 9 | The Pokemon Company International | 82010.00 | 1 |
| 13 | Kadokawa | 25815.00 | 1 |
| 11 | NYAV Post | 24747.00 | 1 |

Table 1

Netflix has an unusually low count at 5, we believe Netflix has only recently started licensing anime towards the end of this time period, resulting in a low License Count. Since the sample size is tiny, we will focus the analysis on Crunchyroll and Funimation lineup to understand their anime selection.

Something important to note; while fact checking some raw data, we found an anime named Jujutsu Kaisen whose Licensor came up as unknown, but is streamed by both Crunchyroll and Funimation. In addition, the updated animelist lists this anime licensed by Viz Media. Since it requires too much resource to search for every example of this type of situation and correct them, we'll acknowledge this section doesn't accurately reflect all of Crunchyroll and Funimation anime selection choices.

# Analysis Report: Identifying Trends in Popular Anime

For Cruchyroll and Funimation we took the total count of each type of genre, unique producers and unique studios for anime licensed for Crunchyroll and Funimation separately. For example, In Figure 10, we counted each time Funimation licensed a specific genre.

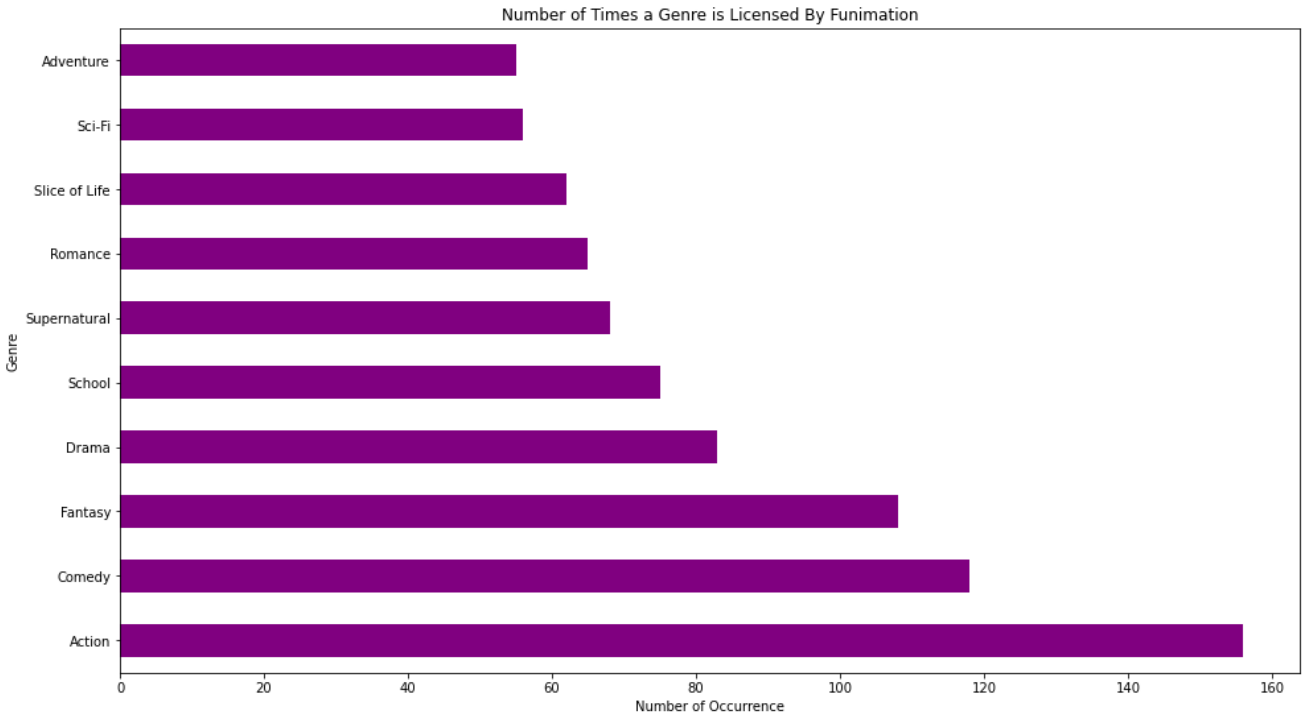


Figure 10

The top 3 Genres for both Crunchyroll and Funimation are Action, Comedy and Fantasy. This is extremely different from the top genres we found from Section 3.3 Most Popular Genres. In that analysis, we found Shounen, Psychological, Superpower, Demon and Game to perform extremely well. We suspect there is an over saturation of anime with these genres and the quantity of lower quality anime pulls down the average viewer interest and average viewer satisfaction significantly. This decrease in average viewer interest and average viewer explains why these genres didn't perform well in our Section 3.3 analysis. Thus we conclude the Action, Comedy, or Fantasy labeling is not a good indicator of popularity.

In the licensor section, an abnormally large fraction of anime licensed by Crunchyroll and Funimation are produced by AT-X. The data shows AT-X funds plenty of anime projects, resulting in a high number of occurrences. The producer analysis we performed in Section 3.4 Most Popular Producers shows on average the work they fund isn't particularly popular. A significant number of producers on this list follow the same trend as AT-X, thus we don't believe Crunchyroll or Funimation choice in producers will be insightful.

For studios, the data shows Crunchyroll either doesn't have a preferred studio when obtaining an anime license or they haven't obtained enough license for a notable trend to show

up. We believe this is a by-product of Crunchyroll's 54 sample size. Funimation's catalog on the other hand is in possession of more licenses thus trends are more apparent. Thus we will focus on Funimation for the studio analysis. For Funimation, anime animated by Bones, Doga Kobo, Lerche, SILVER LINK., Madhouse and J.C Staff make up the highest percentage of their anime licenses. Unlike the Genre segment, over saturation doesn't play a factor in their production quality nor do the studios produce an abnormally high amount of anime.

### 3.5.2 Conclusion

The genre Action, Comedy and Fantasy labeling are not useful indicators for gauging an anime's popularity. Similarly, seeing AT-X as the producer is not a useful indicator for an anime's popularity. The largest percentage of Funimation's license comes from Bones, Doga Kobo, Lerche, SILVER LINK., Madhouse and J.C Staff.

## 3.5 Most Popular Source Material

### 3.5.1 Method & Analysis

To find the most popular source material, we took the same approach as the last few sections. For each source material we aggregate the member and score column to obtain an average score and average member count for each column. Figure 11 and 12 are the results of our aggregation.

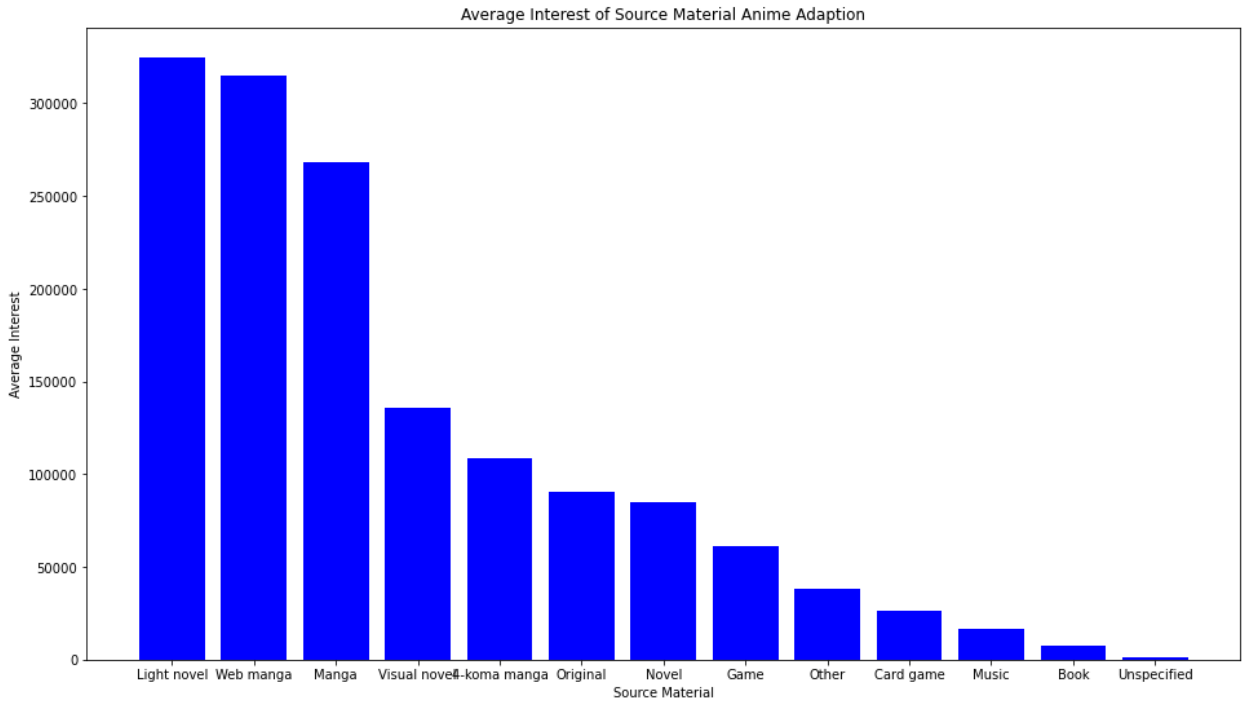

Figure 11

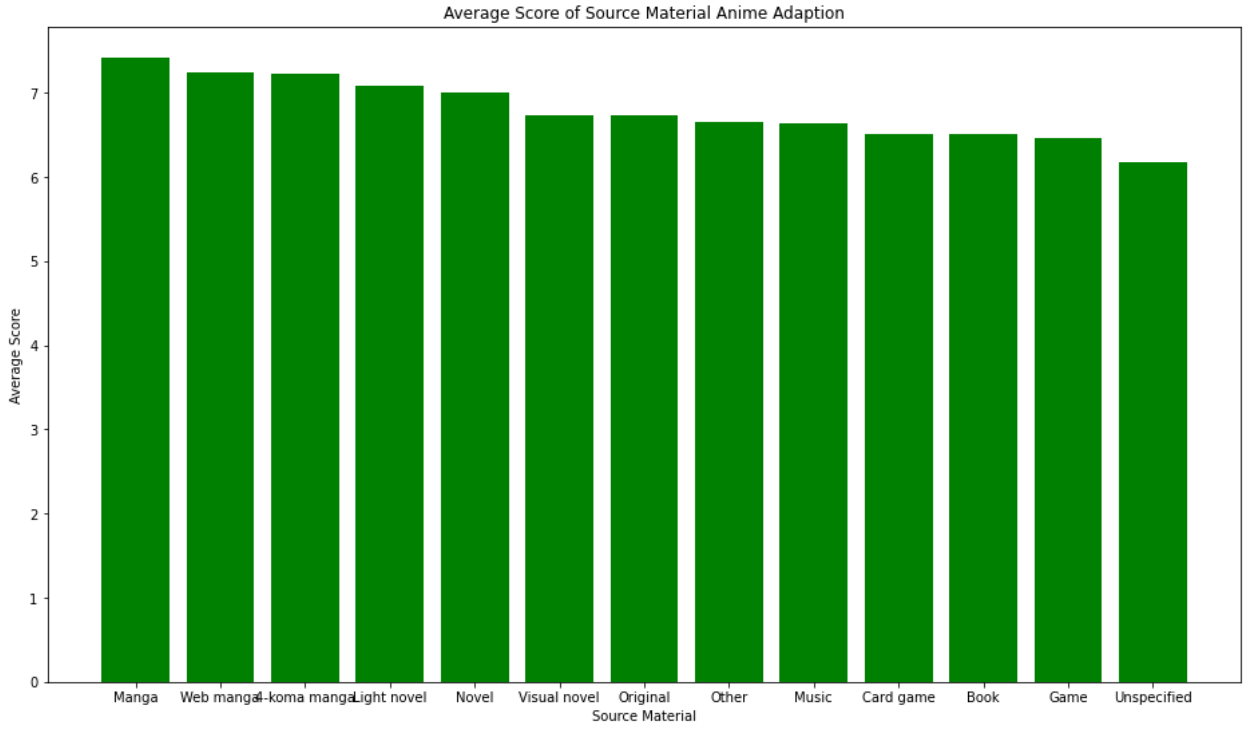


Figure 12

Light novels, Web manga and Manga are the top 3 source material in terms of average viewer interest. This is expected since a large portion of the source material's fan base will watch the adaptations and generally only successful series will get an adaptation. Visual Novel and 4-koma manga are on a similar boat but appeal to a smaller audience which will explain their follow up placing. Anime adaptations of video games are known to be historically unsuccessful or have no merits over playing the original game, hence the extremely low interest. Original anime have no source material, thus have no fan base for interest to transfer over nor a track record to indicate it's potential. So we expect Video Game and Original anime to not perform well. Anime outside the type of source material we've mentioned are extremely uncommon and generally don't perform extremely well. Surprisingly in terms of average viewer satisfaction, the score difference isn't wide. With the given data, we suggest prioritizing anime adapted from light novel, web manga and manga while avoiding anime originals and video game adaptations.

### 3.5.2 Conclusion

For anime adaptations, we suggest looking for anime adapted from Light novels, Web manga and manga. On the other hand, we suggest avoiding video game adaptations and original anime because their track records are not impressive. Additionally we suggest researching the

content and statistics of the source material because these are usually the biggest indicator of anime's success.

## 4. Conclusions

In conclusion

Our objective is to identify trends that would indicate an anime's success. We highly suggest before purchasing a license, the purchaser examine the source material's track record. From personal experience, public reception to a series's source material is the biggest indicator of success. Our findings are the following:

1. Anime that are rated PG-13 or R and one to two seasons long tend to perform the best, particularly anime that are one season long and rated PG-13.

2. For Genres to look for: Shounen, Psychological, Superpower, Game and Demon perform the best. The genre Action, Comedy and Fantasy are not useful indicators for an anime's popularity.

3. For producers, we recommend looking at projects funded by Shueisha, TOHO Animation, Dentsu. Other producers worth looking into are Kodansha, Production I.G, Sony Music Entertainment, J.R East Marketing, Fuji TV and Magic Capsule. AT-X as a producer is not a useful indicator of success.

4. For studios we suggest anime animated by A-1 Pictures, Bones, Lerche and MAPPA based on performance. Doga Kobo, David Production, Silver Link, White Fox, Wit Studio, J.C Staff, Madhouse, Production I.G, T.M.S Entertainment, Shuka and Kyoto Animation are studios with performance comparable with the previously mentioned studios.

5. Anime with the following source material, Light Novel, Web manga and Manga tend to perform better. Anime originating from Visual Novel and 4-koma manga should be given some consideration. Video game adaptations and original anime have a track record of not performing well with a few exceptions. Avoid these unless there is something special about them. Otherwise anime from other sources are not worth considering.

For future works, we suggest using a more updated anime list with proper licensors listed. In addition, part of making an anime successful is the marketing encompassing the release, something that needs to be explored further. The genre section itself is missing some important sub-genres like Isekai which would definitely affect anime's success outlook. Our analysis also did not cover the most unpopular anime genres which would be helpful and something needed to look into.

# Analysis Report: Identifying Trends in Popular Anime

This concludes my report.