



**DAO2702 PROGRAMMING FOR BUSINESS ANALYTICS**  
**K-DRAMA MANIA: BEHIND THE SCENES OF SUCCESS**  
**FINAL REPORT**  
**RANDOM GROUP 3**



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# **1. Introduction**

## **1.1 Background Information**

Korean culture has grown to be an extremely popular culture among people worldwide since the 1990s, even having earned its own moniker, the “Hallyu Wave” (Lee & Zhang, 2020). Korean products have conquered the consumer markets in a variety of industries such as entertainment, electronics and food. The size of the Korean cultural content market is set to reach USD 70.9 billion in 2023, which is the 7th largest in the world (Invest Korea, 2022). Focusing on the Korean drama industry, 66% of respondents globally felt that Korean Dramas (K-dramas for short) were “popular” or “generally popular” (Statista Research Department, 2022).

## **1.2 Problem Statement**

While producing K-dramas is a lucrative business, it is also a highly competitive industry (Witte, 2021). There are many factors at play in determining the success of a K-drama. In which, success of the drama is interlinked with greater profits, as it leads to an increase in advertising revenue and additional streams of revenue such as the sales of related merchandise (Martin Roll, 2021). The aim of this research is thus to analyze the relationship between the measures of success, which will be discussed more below, and the several factors affecting them to help K-drama producers in their decision making process to maximize profits.

# **2. Data Information**

## **2.1 Data Source**

Our data source is a Kaggle dataset (Anitta, 2020) of dramas from MyDramaList, a platform where Asian drama and movie fans can interact and discover new content (MyDramaList, n.d.). It offers a comprehensive amount of detail such as popularity index, ratings by viewers, genre, cast, which provides us with many ways to analyze how the different factors can influence the success of a drama.

## **2.2 Data Cleaning**

To filter out outliers in the dataset, we filtered the “country” column to consider only K-dramas from “South Korea”. Additionally, as viewer preferences may change over time, we decided to focus on data that are more recent from the year 2013 to 2022 under the column “year”.

## **2.3 Data Selection**

The fields of analyses were chosen based on the potential of each factor to affect the success of a K-drama. These factors include the genre, streaming service, cast, as well as the number of reviews and ratings. Additionally, factors that do not have a very clear relationship with a K-drama’s success, such as the number of episodes, were also explored to dispel certain myths about successful dramas.

The success of a K-drama can be quantified in terms of the number of viewers, popularity, ratings, ranking and records that might have been broken. In this analysis, our group focuses on the number of viewers and rating score as key measurements which depict the success of a K-drama. These factors were chosen because they are relatively easy to measure and track, while also providing an accurate representation of how well-received a K-drama is.

## **2.4 Assumptions**

1. The main objective of every K-drama production company is to achieve the maximum potential viewership and therefore profits. This discounts other secondary goals such as the showcasing of artistic work or educating viewers about morals and ethics.
2. Ratings of the K-dramas as recorded by the dataset is a reliable metric of the popularity of the game and will hence be a fair representation of sales volume and measurement of the audience's receptiveness towards it. The dataset should also be an accurate and holistic representation of the whole population of people who watch K-dramas
3. The ratings of K-dramas as recorded in the file is an accurate and valid metric of how well it was received by the general audience. Any interferences from fake, outlier, or overly exaggerated reviews should have had minimal impact on the ratings recorded.

## **3. Data Visualization**

### **3.1 Genre against Number of Viewers/Ratings**

#### **3.1.1 Top Genres Based on Total Number of Views**

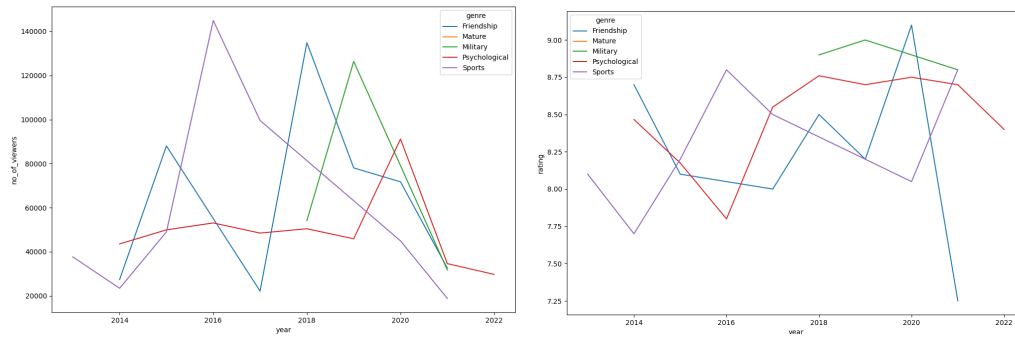
One key factor that influences viewership is the genre of a K-drama. To investigate the influence of different types of genre on a K-drama's success, we first found the top 5 genres which had the highest number of views: Romance, Comedy, Drama, Mystery, and Thriller. However, since a significant proportion of K-dramas do fall into these categories, a K-drama production company would likely already be aware of the popularity of these genres.

#### **3.1.2 Top Genres Based on Average Number of Views**

To provide an alternative perspective that might help a production company stay ahead of its competition, we also consider the average viewership for each genre. In this case, the top 5 genres are: Friendship, Mature, Military, Psychological, and Sports. As there may be fewer dramas of these genres, these genres may not rank as highly in terms of total number of viewers. However, if we instead use average number of views, it is evident that these genres are in fact performing relatively well for each drama of these genres produced.

#### **3.1.3 Accounting for Trends in Recent Years**

In addition, the production company should also account for the significance of the change in viewership over time in order to observe the most recent trends in viewership. Looking at the top 5 genres by average number of views in Figure 3.1.1, the friendship genre in particular has had the greatest fluctuation in success, whereas the psychological genre has had generally more consistent performance. Moreover, for the past 3 years since 2020, the psychological genre has had the highest average number of viewers.



*Figure 3.1.1 and 3.1.2: Line Graphs of Average Number of Viewers and Average Rating against Year respectively for Top 5 Genres*

### 3.1.4 Recommendations

These observations indicate that the psychological genre has a strong potential for success and could be a wise choice for a production company, especially in recent years. Producers could also compare the genres' performance based on their average rating. The Sports genre looks the most promising with a sizable increase from 8.0 to 8.75 in the past 3 years (Figure 3.1.2).

Furthermore, the company could also evaluate the possibility of mixing these genres with the more popular genres such as Romance and Comedy. This strategy would combine the best performing genres based on total and average viewership, thereby bolstering the producer's chances of success. Finally, if the production company is risk-averse, they should also consider avoiding genres which tend to have greater variance, such as "Friendship". While we largely focus on individual genres that might be most suitable for a production company in this analysis, we acknowledge that K-dramas typically encompass multiple genres. Hence, further analysis could be conducted to investigate which combinations of genres tend to be most successful.

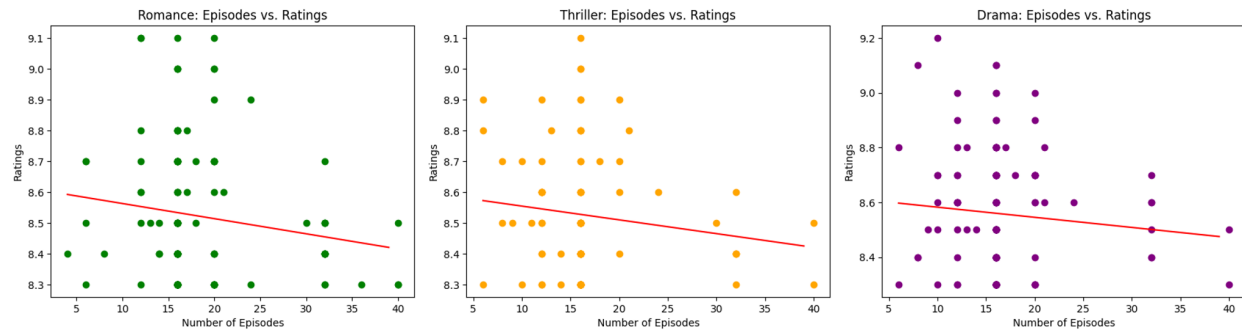
## 3.2 Number of Episodes against Ratings

### 3.2.1 Basis of Analysis

Next, we hypothesized that the amount of time it took for a K-drama to finish airing could affect its ratings. Research that posits that the amount of time taken to tell a story can affect the receptiveness of the audience (Dhote & Kumar, 2019). They claim that there is an ideal amount of time that a brand should take to tell their story to the audience that would maximize their appreciation of the content. As such, this data analysis was carried out to test out this hypothesis.

### 3.2.2 Data Analysis

Given that the genre of the K-drama can affect the ratings, it is crucial that the theory of the number of episodes being correlated to the ratings should exclude this confounding factor. As such, K-dramas that were characterized by any of the top 3 genres, that is, "Romance", "Thriller", and "Drama" were used for this analysis. In doing so, we can be more certain that the trend we observed will be applicable to most K-dramas that will be produced in the future. As less than 5% of the K-dramas recorded had more than 40 episodes, these outliers were removed.



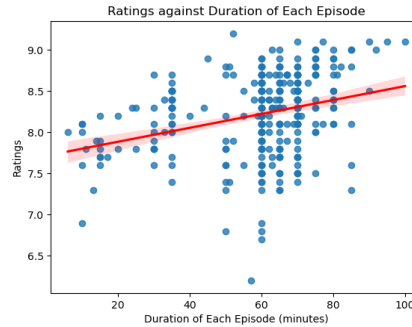
*Figure 3.2.1: Filtered Scatter Plot of the Ratings of K-dramas against the Number of Episodes with the Regression Line across Genres of Romance, Thriller and Drama (Left to Right)*

Across the 3 most common genres of K-dramas, there is a consistent trend of a negative correlation between the number of episodes and the ratings of K-dramas, as seen in the regression lines marked in red (Figure 3.2.1). This indicates that any increase in the number of episodes could cause a decrease in the ratings of a K-drama. Research also suggests that audiences may find television shows with too many episodes overly draggy and thus unlikable (Colladon & Naldi, 2019). To test the reliability of this observation, the coefficient of determination of each slope was calculated, as seen in the upper right corner of each scatterplot. This value was consistently less than 0.1, which is considered extremely low. This result strongly suggests that the correlation found between the number of episodes and the ratings through this data analysis is unlikely to accurately predict the outcome of any future K-dramas produced.

Hypothesis testing was then employed to further analyze this data. The null hypothesis was that the slope of the linear regression line should be 0, that is, there is no correlation between the number of episodes and the ratings of K-dramas. The alternative hypothesis was that the slope of the linear regression line should not be 0, that is, the number of episodes does affect the ratings of K-dramas. A similar conclusion was obtained, in that the p-values obtained across all 3 genres were consistently more than 0.05. As such, it is only possible to conclude that there is insufficient evidence to reject the null hypothesis. Therefore, there is insufficient evidence obtained from this dataset to assert that the number of episodes affects the ratings of K-dramas. It is also likely that the number of episodes in a K-drama could have been affected by other confounding factors, such as the production budget and cast availability, as opposed to the popularity of the K-drama. As such, we currently have insufficient data to conclude that the number of episodes affects the ratings of a K-drama.

### 3.3 Duration of Each Episode against Ratings

Another variable identified that might possibly affect the ratings of the listed Korean dramas was the duration of each episode of the drama. The data obtained suggests a positive relationship between the duration of each episode and the ratings of the drama, suggesting an increase in the ratings as the duration of episodes increases (Figure 3.3.1).

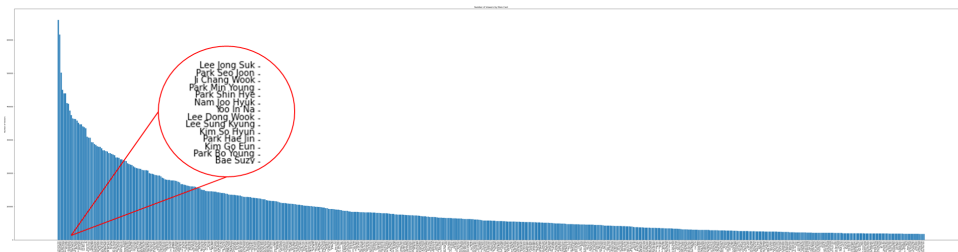


*Figure 3.3.1: Scatterplot of Duration of each Episode against the Ratings of K-dramas*

The data showed a relatively low variance, as indicated by the pink area adjacent to the slope. However, the correlation coefficient calculated was 0.307 (3 s.f.), far from having a clear-cut correlation between ratings and the duration of each episode. This could be due to the dramas being classified into different further subcategories such as web series which can be as short as 6 minutes per episode and the usual drama series which lasts up to 1 hour 40 minutes an episode. Given this data, we would recommend that producers consider other factors before this.

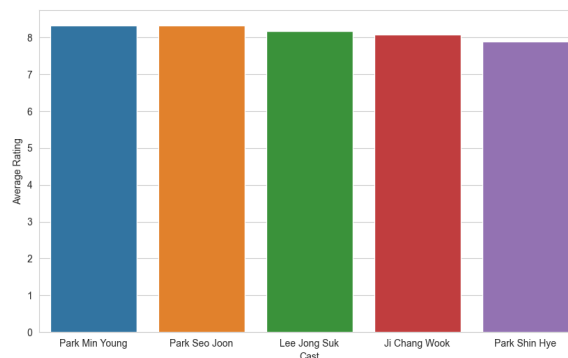
### 3.4 Cast and Number of Viewers/Ratings

#### 3.4.1. Data Analysis



*Figure 3.4.1: Total Viewership for each Cast Member*

The fame of actors and their popularity among audiences can affect the success of K-dramas as well (Parc & Hwy-Chang, 2013). Hence, we plotted a bar chart in Figure 3.4.1 to show the cumulative viewership of each actor or actress who acted as a main cast member. The majority of the main cast accumulated fewer than 300,000 viewers. In addition, we also evaluated the performance of each drama featuring the top 5 cast members in terms of rating, as shown in Figure 3.4.2.



*Figure 3.4.2: Average Rating for Top 5 Cast Members*

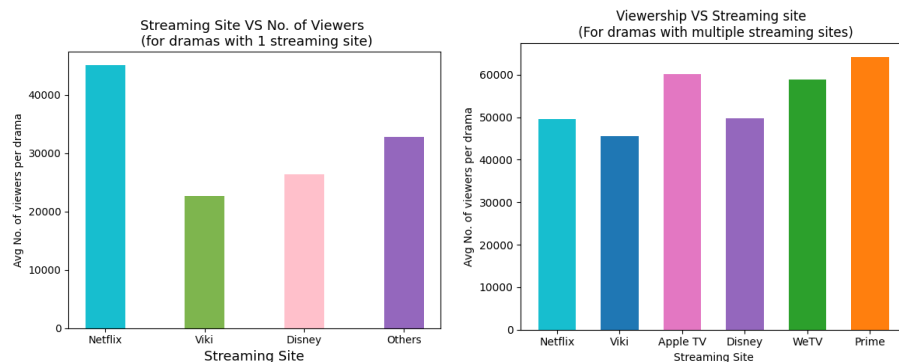
### 3.4.2 Recommendations

Based on cumulative viewership, the top 5 cast members consisting of Lee Jong Suk, Park Seo Joon, Ji Chang Wook, Park Min Young, and Park Shin Hye would be good choices for production companies as their viewership levels are much higher than the average, at around 600,000 or more than 400,000. Furthermore, Park Seo Joon (actor) and Park Min Young (actress) have the highest rating per viewers and thus are great candidates for a role in the main cast.

## 3.5 Streaming Service Against Popularity

### 3.5.1 Data Analysis

Next we wanted to see if the streaming site that the drama is airing on will have an impact on the number of viewers. A drama production company has the choice to stream the drama on either a combination of streaming sites or just one. Using the Pandas `describe` function, we found 190 unique values for streaming sites. In order to plot the average view count per drama for each streaming site independently, we firstly filter away dramas that were aired on two or more streaming sites. Thereafter, we narrowed down the streaming sites to those with a significant sample size such as Netflix, Viki and Disney. The other sites that have an insignificant sample size are grouped under 'Others'. The resultant graph is then plotted as seen in Figure 3.5.2.



*Figure 3.5.2 and 3.5.3: Bar Charts showing the Viewership across Streaming Sites for Dramas using a Single Site and Multiple Sites respectively*

As for dramas that were streamed on multiple streaming services, we cannot determine the breakdown of the views for each streaming site individually. Hence, we used the 'contain' function to identify the dramas that were aired on the respective services and calculated the average views per drama for that service. Figure 3.5.3 compares the average viewership and the streaming site for dramas with multiple streaming sites. However, since it is not possible to compare the individual impact of streaming sites, the average views could have been confounded by popular sites that were aired together and thus be inaccurate.

### 3.5.2 Recommendations

Based on current data, producers are most likely to benefit from screening their K-dramas on Netflix as a single streaming site, or a combination of Apple TV and Prime if they intend to use multiple screening services. Even so, they should be mindful of their overarching goals of creating a successful K-drama. Streaming services such as Netflix are known to impose licensing rights to popular K-dramas if they are successful, which could give producers lesser returns than initially expected (CFC, n.d.). This would be undesirable if their success is measured by their



profits. However, if they determine success to be measured by popularity, this potentially lower than expected revenue would play a less significant role in the production company's choice of streaming service. Producers could thus make a more informed decision if more specific data about the breakdown of potential profits earned using each streaming service were made available to them.

### **3.6 Market Saturation**

From Figure 3.2.1, the genre of K-dramas with the highest viewership is "Romance", followed by "Thriller" and "Drama". Considering the fact that there are numerous popular K-dramas that fall under the genre of "Romance" and "Thriller", by producing another K-drama that falls into either of these categories, there is a lower chance of it becoming popular and therefore successful, as there will likely be stronger competition to get ahead of. On the other hand, the "Drama" genre has relatively high ratings, but a much lower number of K-dramas that fall under this category. Hence, it is reasonable to argue that the genre of "Drama" appears to be non-saturated in the current market of K-dramas, despite its proven success from its high ratings. Therefore, we recommend that producers focus on K-dramas that are of the "Drama" genre to efficiently compete in a less competitive and reasonably profitable market.

## **4. Limitations**

### **4.1 Target Audience**

The data utilized is only from My Drama List (MDL), which contains data from the international audience instead of the Korean audience. As such, our analysis was based on the preferences and perceptibility of the average K-drama watchers in the international context, and also did not take into account other demographics including the gender, wealth status, as well as the demographic locations of the watchers. These factors might affect the receptiveness and perceptivity of the watchers towards the K-drama. Nonetheless, it all boils down to which market or demographic the producers want to capture, in which our recommendations will be relevant to those looking to target the international scene.

### **4.2 Exclusion of outlier**

When analyzing the relationship between the number of episodes and the K-drama ratings, outliers such as the ratings for dramas with more than 60 episodes were left out due to the lack of data points. This could have impacted the correlational analysis for the graph we have plotted, and perhaps serve as useful analytical points should the producers wish to consider long series K-dramas.

### **4.3 Impact of Covid-19**

With the implementation of stay-home orders due to the pandemic, the demand for online streaming services has accelerated. For example, by June 2020, 48% of US online adults had subscribed to at least one streaming service (Forrester, 2021). This could result in a greater number of K-drama views regardless of the effect of the factors that we have discussed. As such, it could potentially erode the relationships and analysis of the factors against the viewership.

#### 4.4 Evaluation of genre and streaming sites

Most K-dramas have more than one genre and streaming site. In order to analyze the data, we segregated the genres and streaming sites of the K-dramas as shown below. This may result in a slight inaccuracy in the analysis since the individual impact of the factors is not taken into consideration.

Name of Drama	Genres	No. of Viewers		Genres	No. of Viewers
Goblin	Comedy, Romance, Fantasy, Melodrama	172175	→	Comedy	172175
				Romance	172175
				Fantasy	172175
				Melodrama	172175

*Figure 4.4. Splitting of genres for dramas containing multiple genres*

#### 4.5 Budget consideration

There is a lack of data regarding the production budget of each K-drama, which has a significant role to play in the success of a K-drama (Conran, 2021). As a result, relationships between the budget and the factors which we concluded affect the popularity of the K-drama could not be determined. Therefore, the recommendations may not be relevant to producers with a tight or small budget, should there be a positive correlation between the production budget and factors we have discussed. These producers may have to depend on other factors like scriptwriting and budding lower cost actors to make up for it.

### 5. Discussion

Overall, K-drama producers should consider a holistic set of factors including the features from the Kaggle dataset as well as relevant industry knowledge. We recommend that they explore genres that have been performing well on average in recent years such as the “Psychological” genre, and possibly also mixing in a few proven genres such as Romance and Comedy. Although there is insufficient evidence from this dataset to confirm any relationship between the number of episodes and ratings of K-drama ratings, the positive relationship between episode length and average ratings could be another key consideration for production companies. We recommend generally longer durations for each episode in the range of 60-90 minutes. Regarding cast selection, production companies should opt for popular celebrities so long as it is within their budget. Ultimately, viewers appreciate quality content and the featuring of popular cast members would only serve as a short-term solution in attracting higher viewership while incurring significant costs. Rather, a more sustainable approach should involve considering the potential long-term impacts of partnering with certain streaming services, such as licensing rights and advertising revenue (Castillo, 2018), especially if the K-drama turns out to become a huge hit. Finally, it is vital to keep in mind that the preferences and interests of the K-drama audience may not remain stagnant in the coming years. Thus, production companies should use our data analysis results in tandem with other means of surveying the preferences of the audience in their overall decision-making process.

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