

Capstone Project 1

Play Store App Review Analysis

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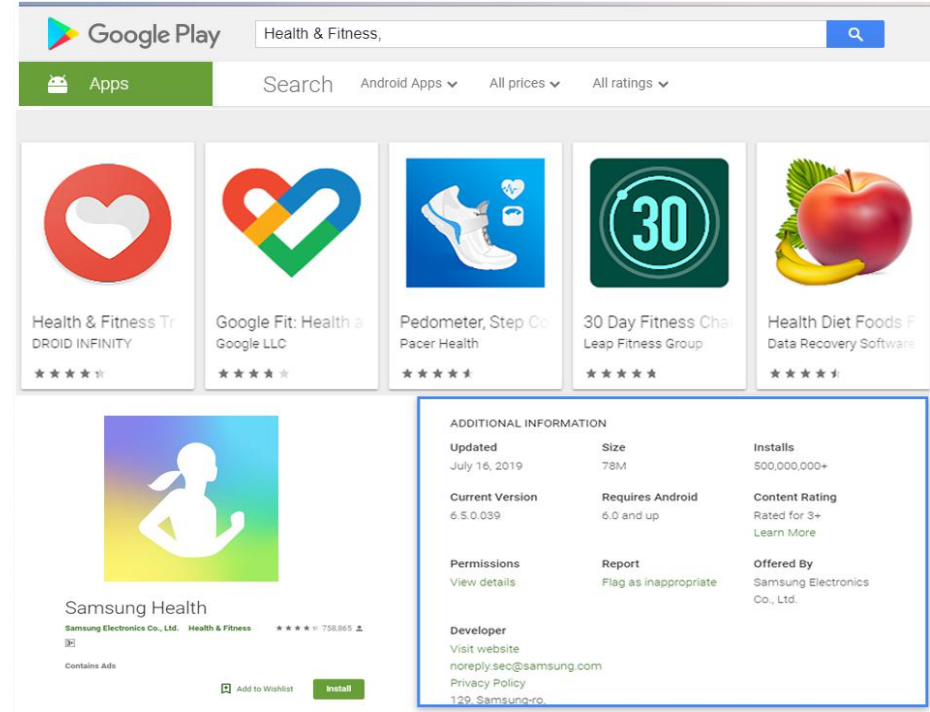
Lets Explore

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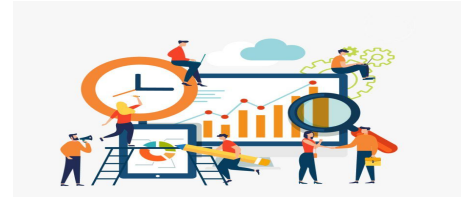


Introduction

- ❖ The Google Play Store is the official pre-installed app on Android devices.
- ❖ It allows users to browse and download music, books, movies and lots of applications from Google Play.
- ❖ It is the largest and most popular Android app store with around three million different apps available for users to download.



Data Pipeline



- ❖ **Data Wrangling**- The process of cleaning and unifying messy and complex data sets for easy access and analysis, which includes treatment of null values, removing duplicates.
- ❖ **Data Processing**- In this process, we manually examined each feature and processed the null values, by replacing them with the mean or median values, plotted a box plot to detect outliers and transformed data types into another for easy interpretation.
- ❖ **EDA** – In this part, we did some exploratory data analysis(EDA) on the selected features to draw conclusions.

Data Summary



Variables Description In Google Play Store:

- ❖ Apps - Application name
- ❖ Categories - Category of given application
- ❖ Rating - Rating is a reflection of how users respond to the apps. Rating of app which is between 0 and 5.
- ❖ Reviews - A review is judgement or discussion of the quality of something. Review also means to go over a subject again as part of study or to look at something another time.

- ❖ **Size** - The amount of space required to install the app. This feature shows the size of the application.
- ❖ **Installs** - This feature represents the number of installations on devices.
- ❖ **Type** - This feature tells us whether an app is free or paid.
- ❖ **Price** - This column shows the price of certain apps.
- ❖ **Content Rating** - Apps use a separate content rating system. Titles rated ALL have content that may be suitable for all ages. Titles rated 12+ have content that may be suitable for ages 12 and older. As it separates users from accessing content that is irrelevant to them depending on their age.

- ❖ **Genres** - App genres help us determine the type of apps our users are building. Detailed category of app.
- ❖ **Last Updated** - This feature represents the date when the application was last updated. Updating the apps gives us access to the latest features and improves app security and stability.
- ❖ **Current Version** - A positive integer used as an internal version number. This number is used only to determine whether one version is more recent than another, with higher numbers indicating more recent versions.
- ❖ **Android Version** - Android version indicates the version of Android platform. The bigger the version number is, the newer the Android is.

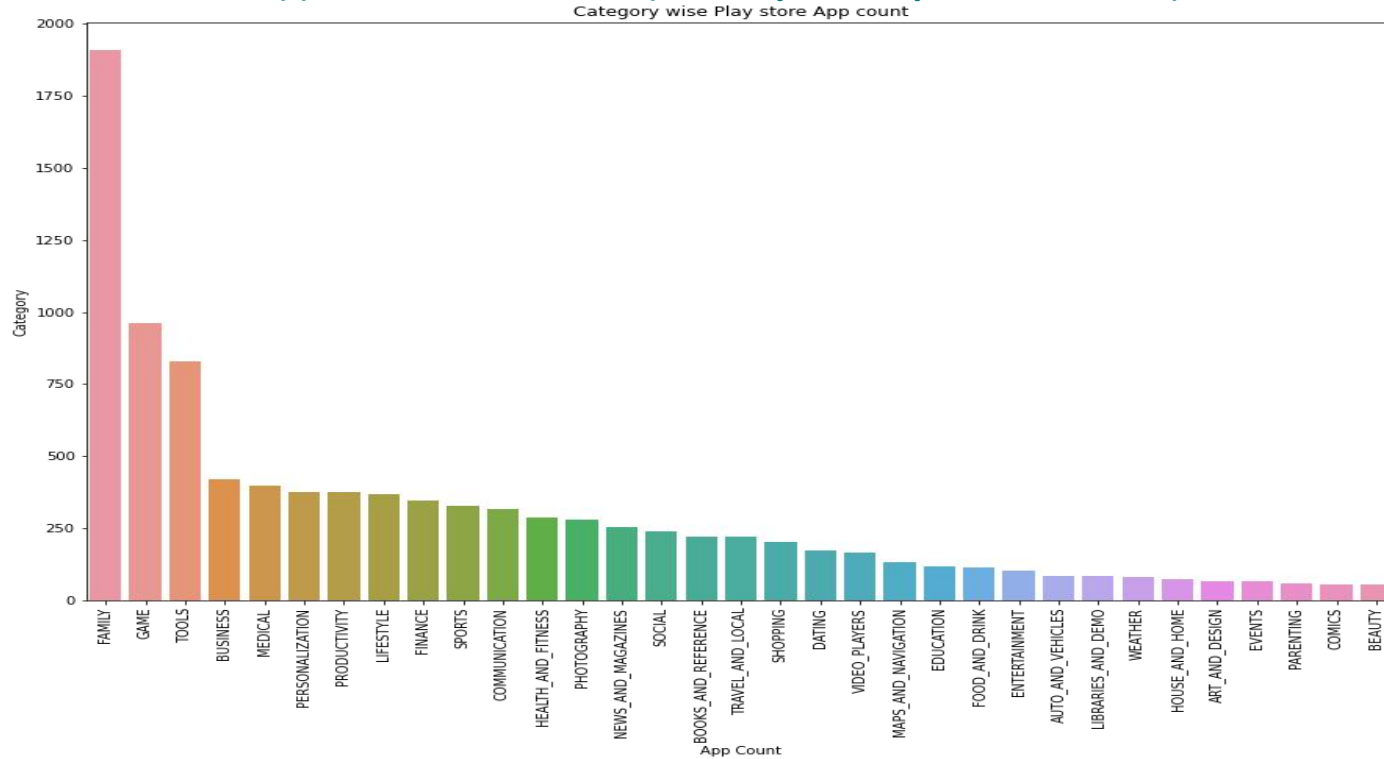
Variable Description In User Reviews:

- ❖ Apps - Application name
- ❖ Translated Review - Review for given app
- ❖ Sentiment - Boolean values of user translated reviews; 'positive','negative and 'neutral'.
- ❖ Sentiment Polarity - Sentiment polarity for an app defines the orientation of the expressed sentiment. It is calibrated value of translated reviews that varies from -1 to 1.
- ❖ Sentiment Subjectivity - Sentiment Subjectivity is basically pitch of translated reviews that varies from 0 to 1.

Exploratory Data Analysis

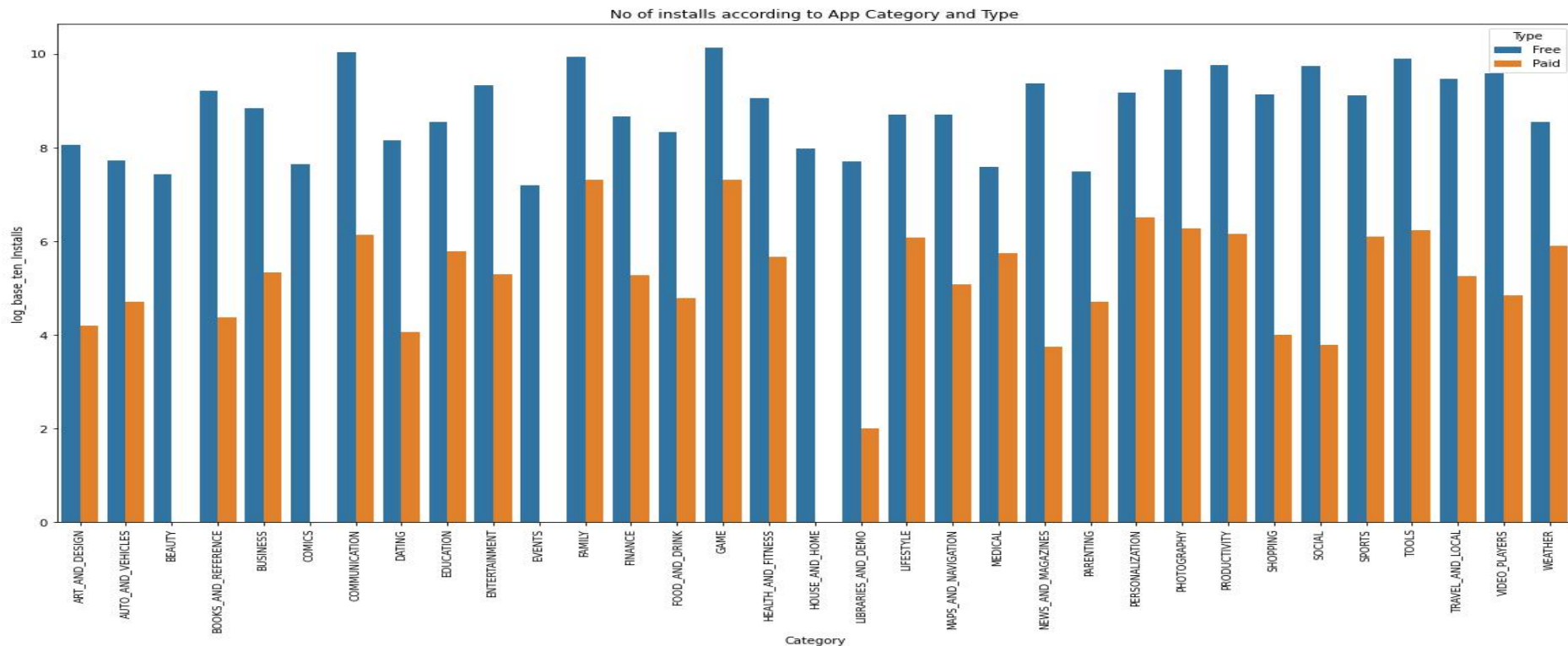
Category Wise App Count

- ❖ Family, Games & Tools were the most common categories, accounting for about 19.5%, 10% and 8.5% of the total number of apps in our dataset, respectively. Beauty was the least prevalent category.



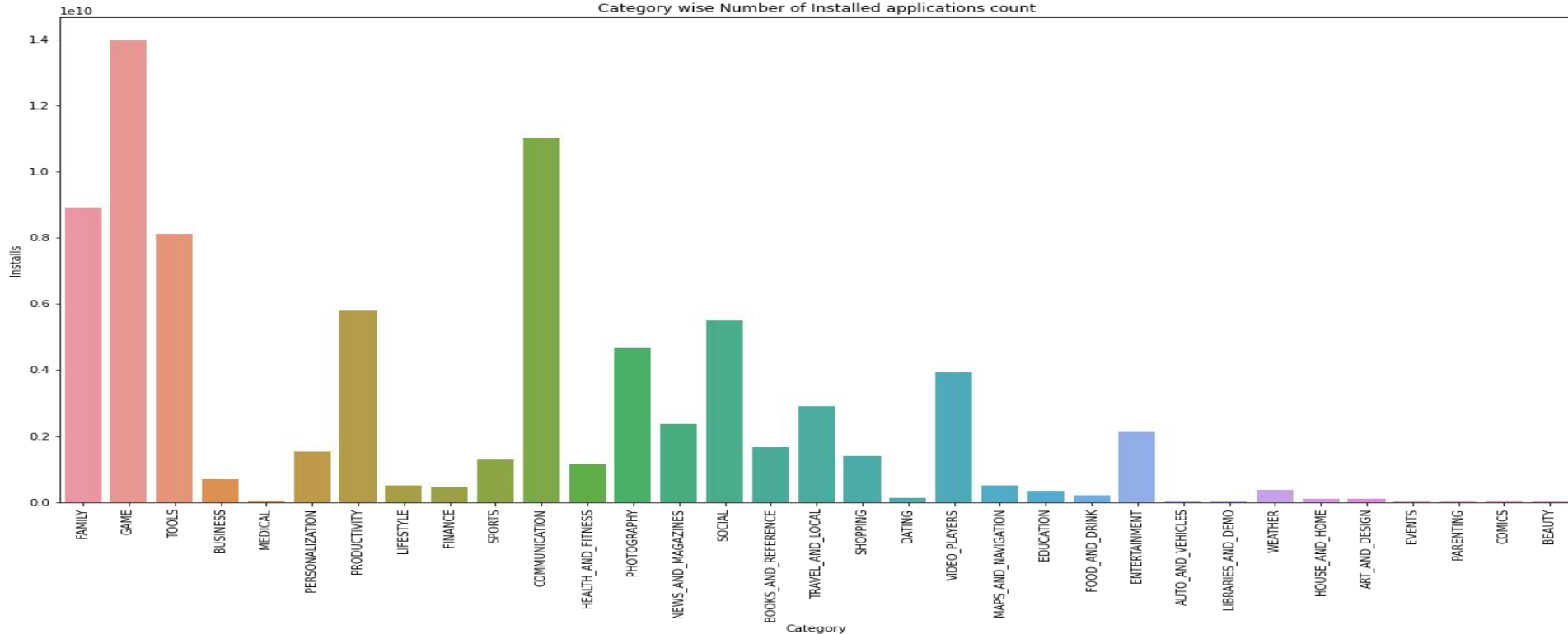
Comparing Category And App Type (Free, Paid) by count of installs.

We can deduce that The Game and Family category has the highest number of Installation.



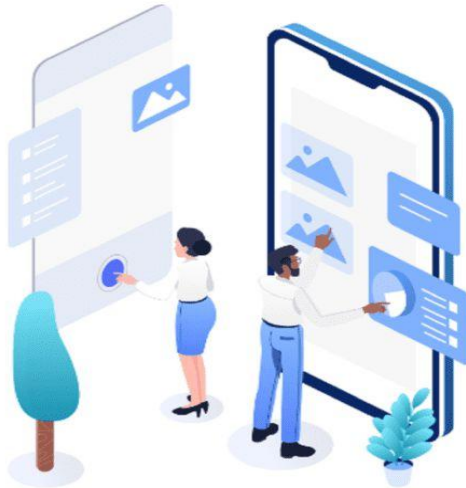
Number of Installed Applications

- ❖ Here Game, Communication & Family categories have the highest number of apps installed.
- ❖ Among the apps that had been downloaded between range 0.8 to 1.4+ times were Instagram, Facebook, Google + and Google News as per the present scenario.

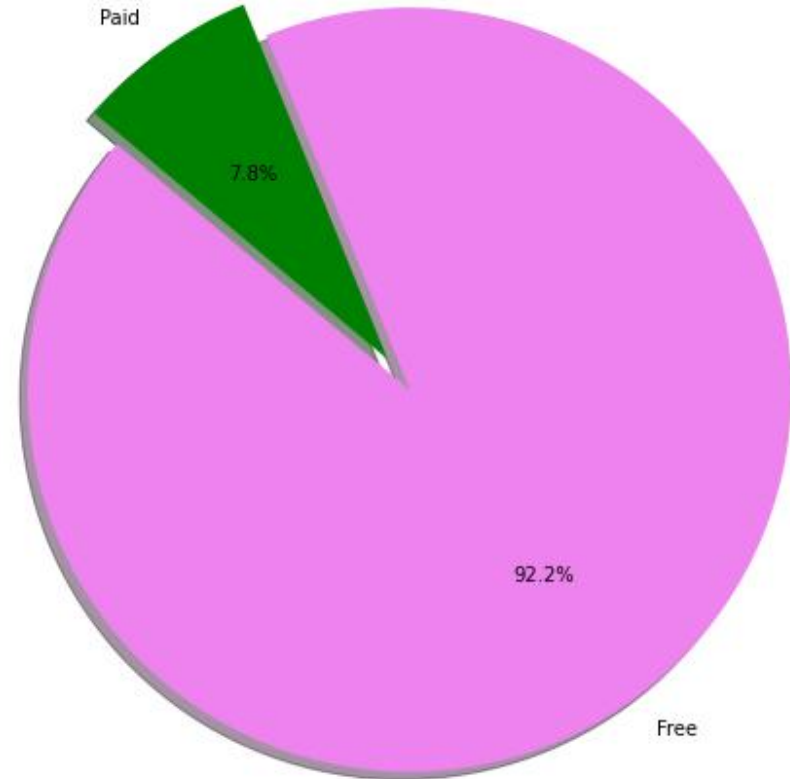


Free Vs. Paid Apps

- ❖ Here we can see that there are 92.19% of apps are free and only 7.81% of Apps are paid on Playstore.

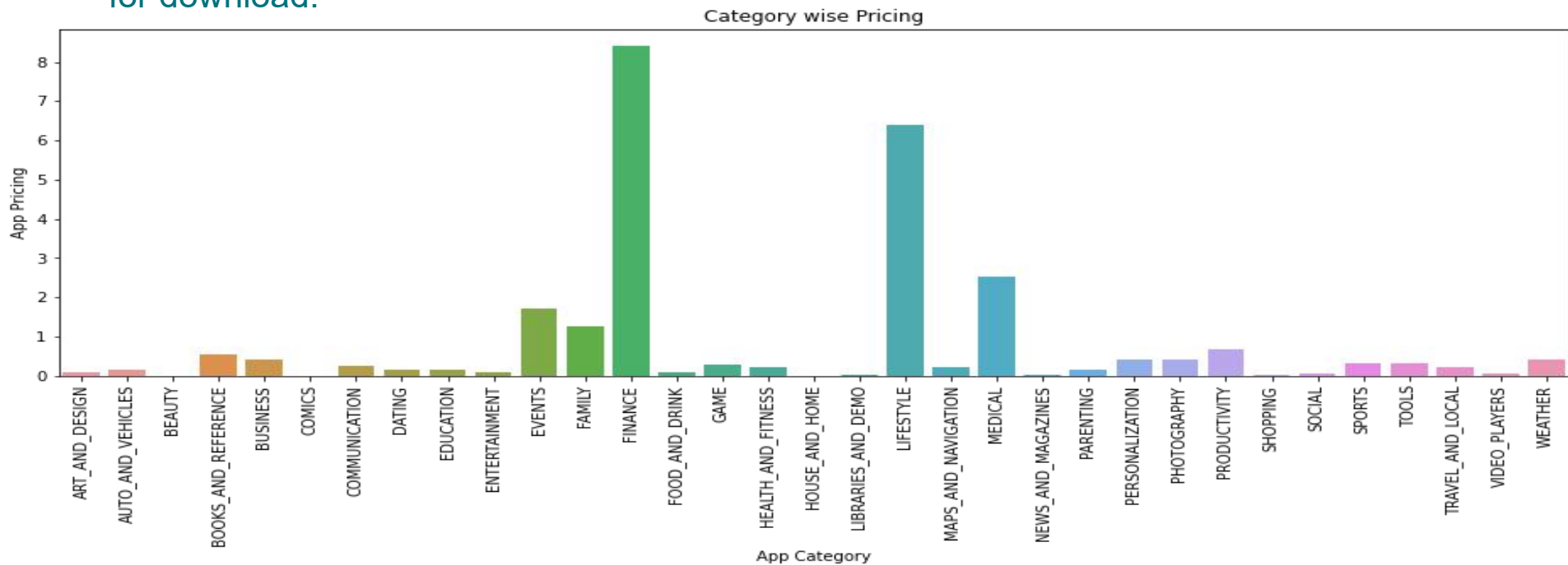


Paid vs Free Apps Percentage in store



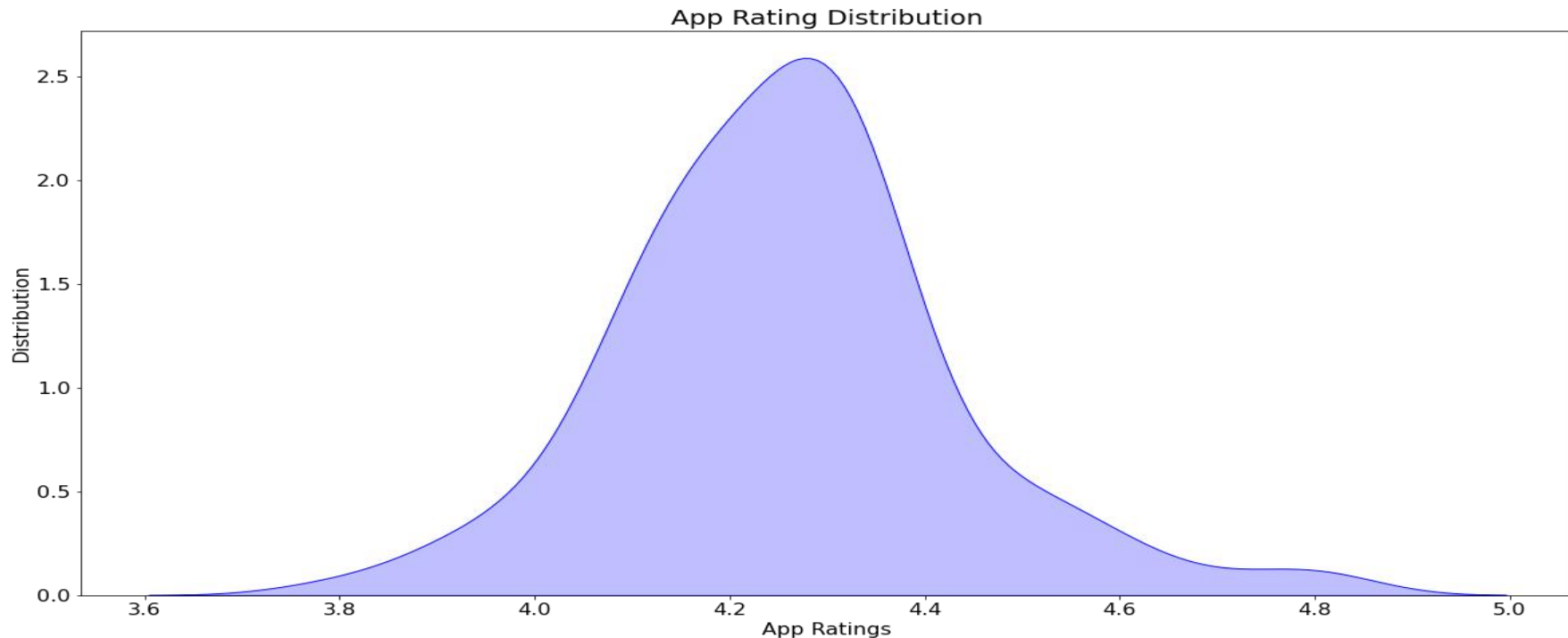
Category Wise Pricing Visualization

- ❖ The majority of apps except Finance, Lifestyle, Events & Medical categories were free to install.
- ❖ Lifestyle, Finance, and Medical categories had the biggest number of paid apps available for download.



Distribution of User Ratings

- ❖ This distribution plot shows us the distribution of ratings. Average ratings of apps is between 4.2 to 4.3
- ❖ Most of the apps are rated within the range of 4.0 to 4.6.



Category Wise User Ratings

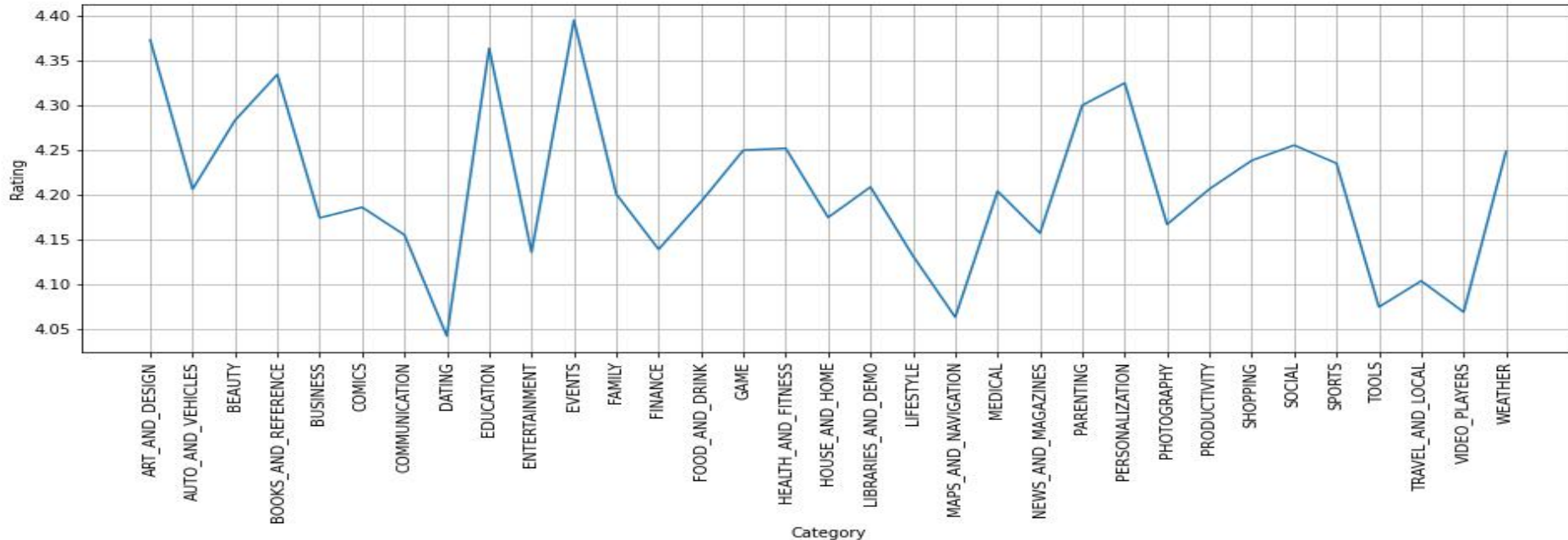
A. Highest Ratings apps:

Events, Art and Design, Education categories has got 4 and above ratings.

B. Lowest Ratings apps:

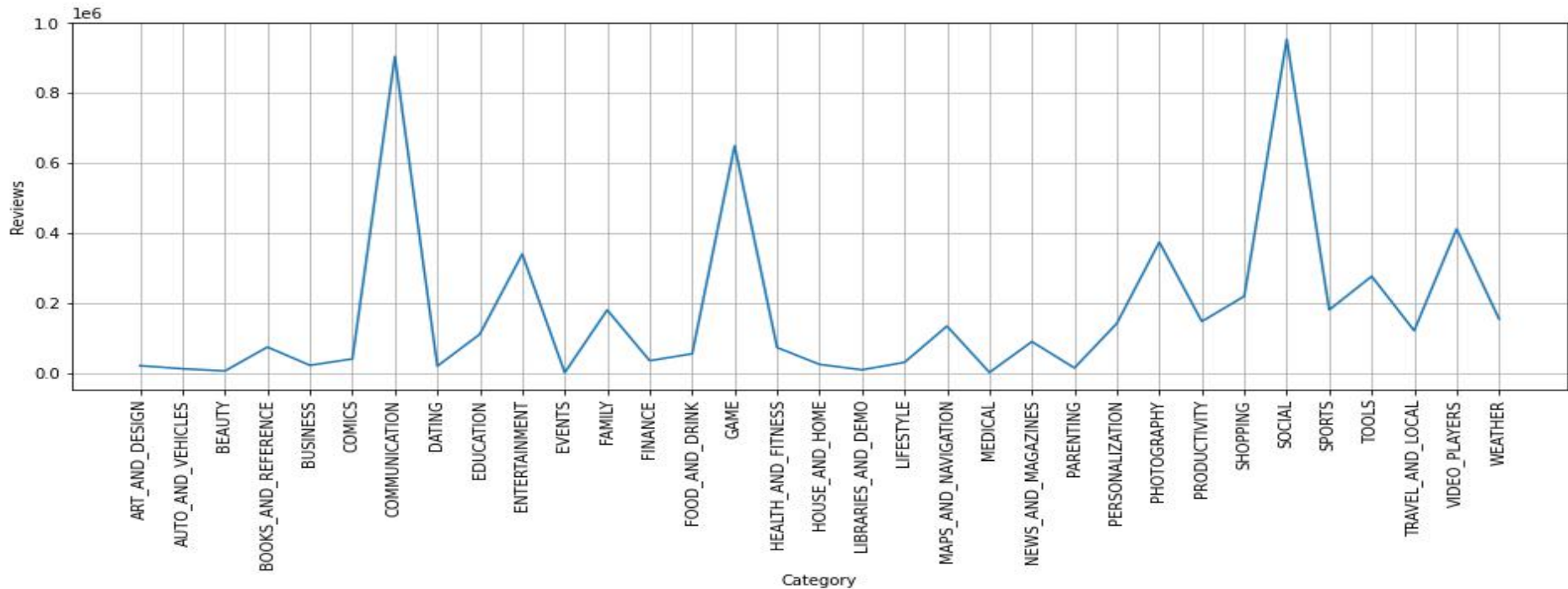
Dating, Maps and navigation, Video players category has got lowest ratings i.e. below 4.

Here Most of the apps are rated between 4.15 to 4.30.



Category Wise User Reviews

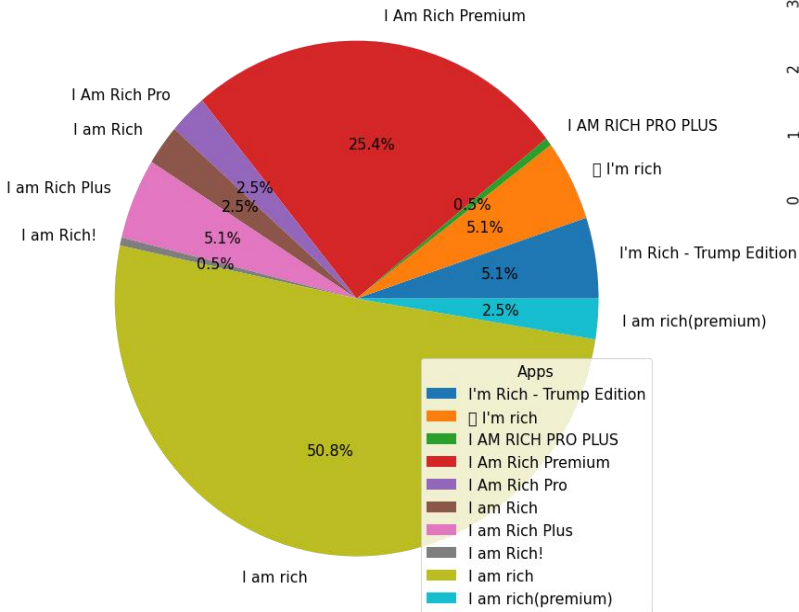
- ❖ This plot shows the mean of each categories with respect to user reviews.
- ❖ Users tend to leave more reviews for apps in communication, game & social categories.



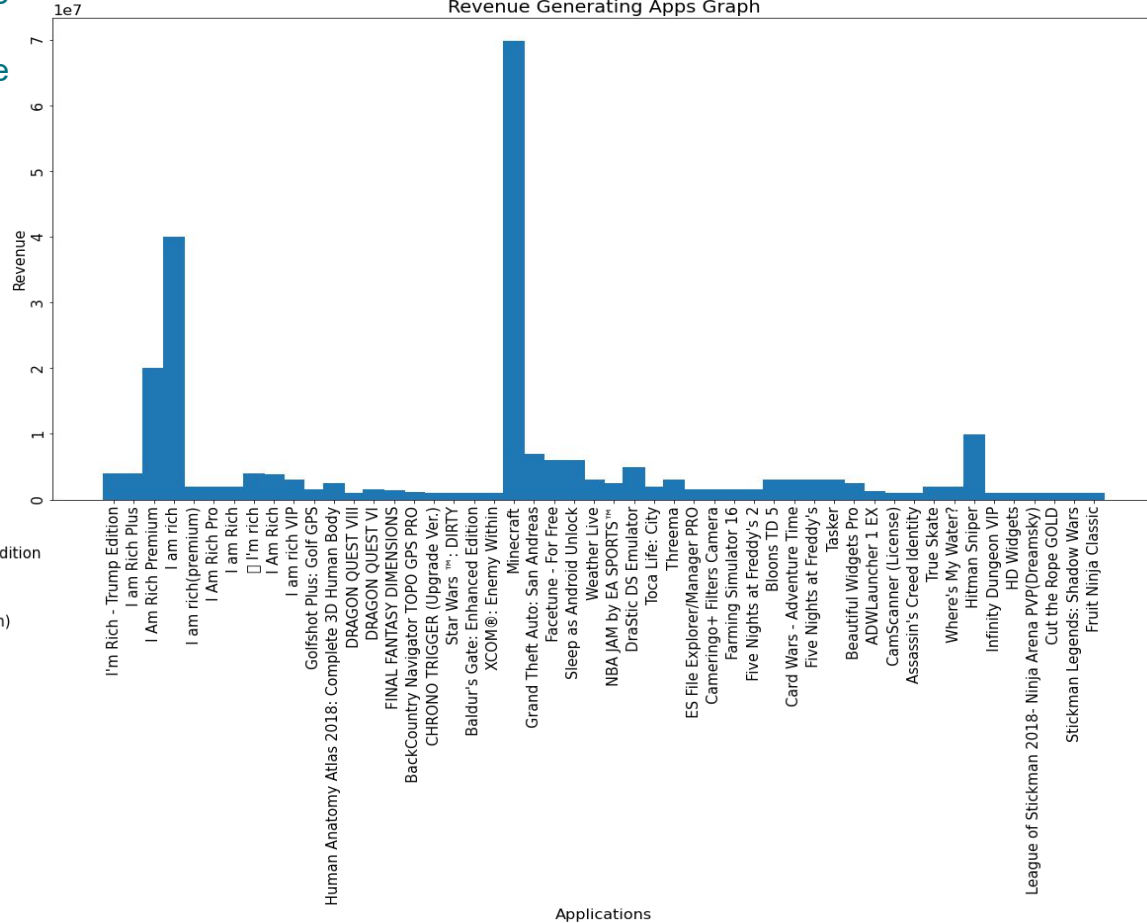
Revenue And Top Expensive Apps

- ❖ The majority of apps which generate revenue is between 0 to 10 million .
- ❖ Minecraft is generating Highest Revenue among all its about 70 million.
- ❖ "I am rich" and "I am Rich Premium" are the two most used expensive Apps.

Top Expensive Apps

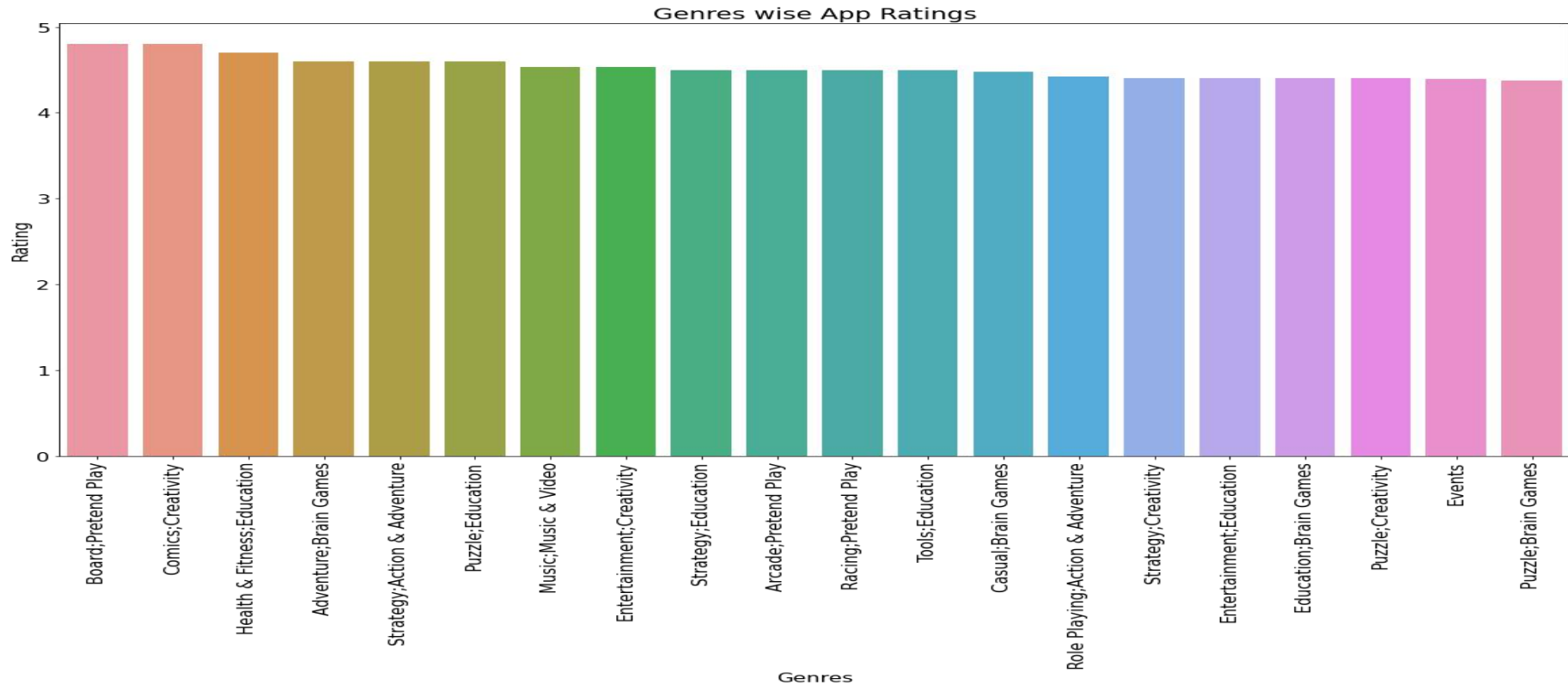


Revenue Generating Apps Graph



Genre wise App rating

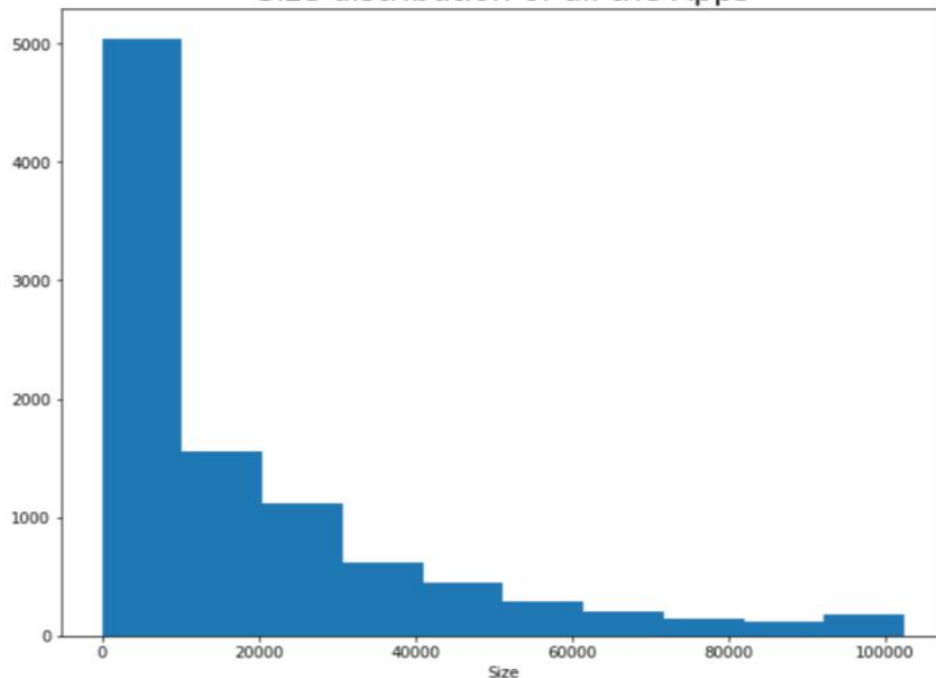
❖ Average rating for apps by genre wise is between 4 and 5



Size Distribution

- ❖ Maximum app are in the size category of 10000 KB to 30000 Kb i.e. 10MB to 30 MB
- ❖ size category of 0 KB (varies with devices) showing highest count

Size distribution of all the Apps

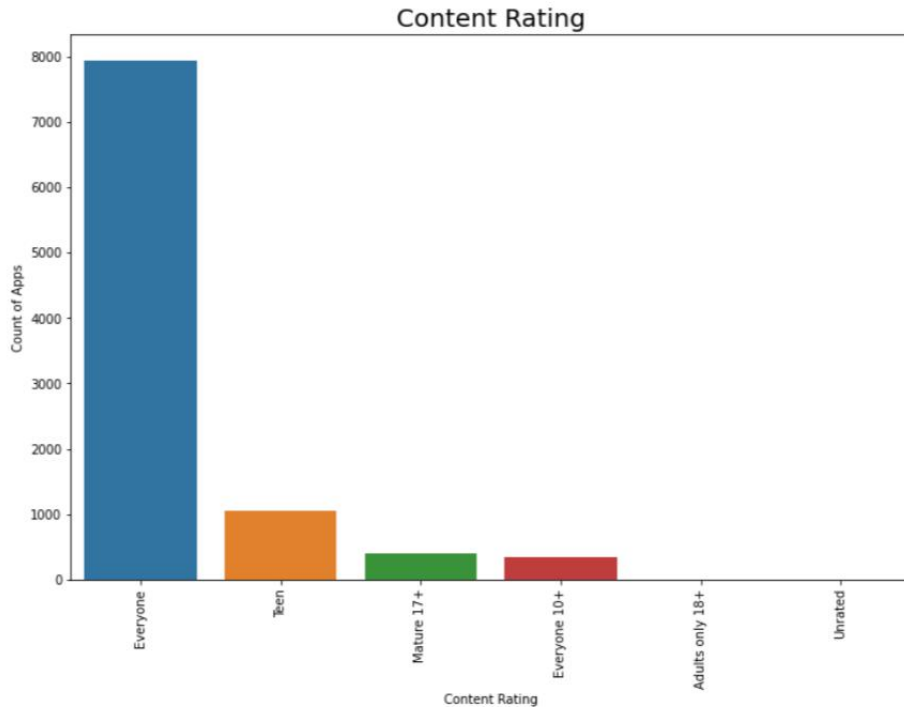


Correlation Between Different Parameters

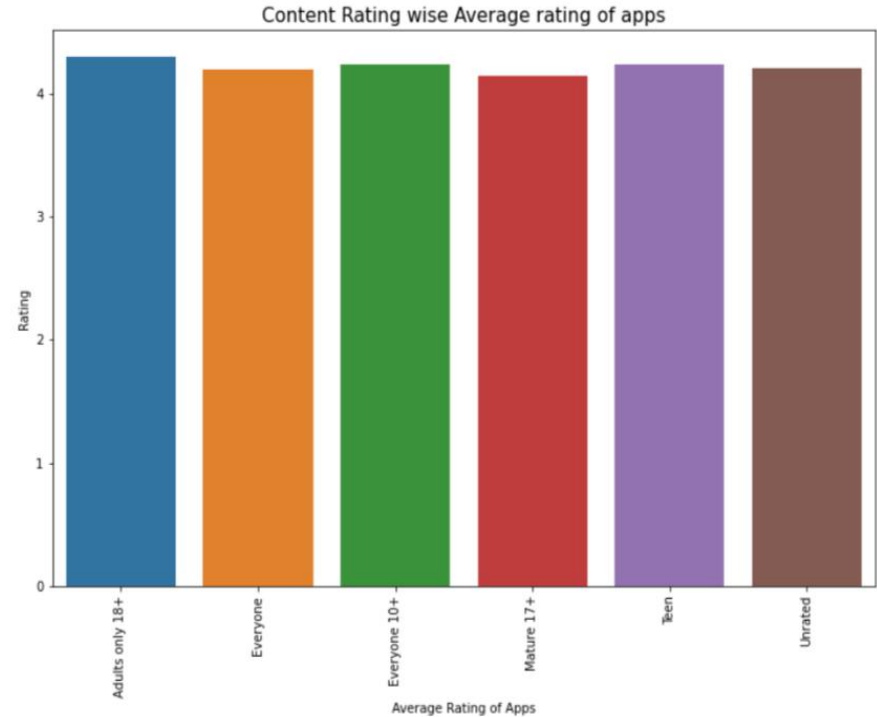
- ❖ We can see that installs and reviews have the strongest correlation.
- ❖ There is no correlation found between installs and other features.



Content Rating



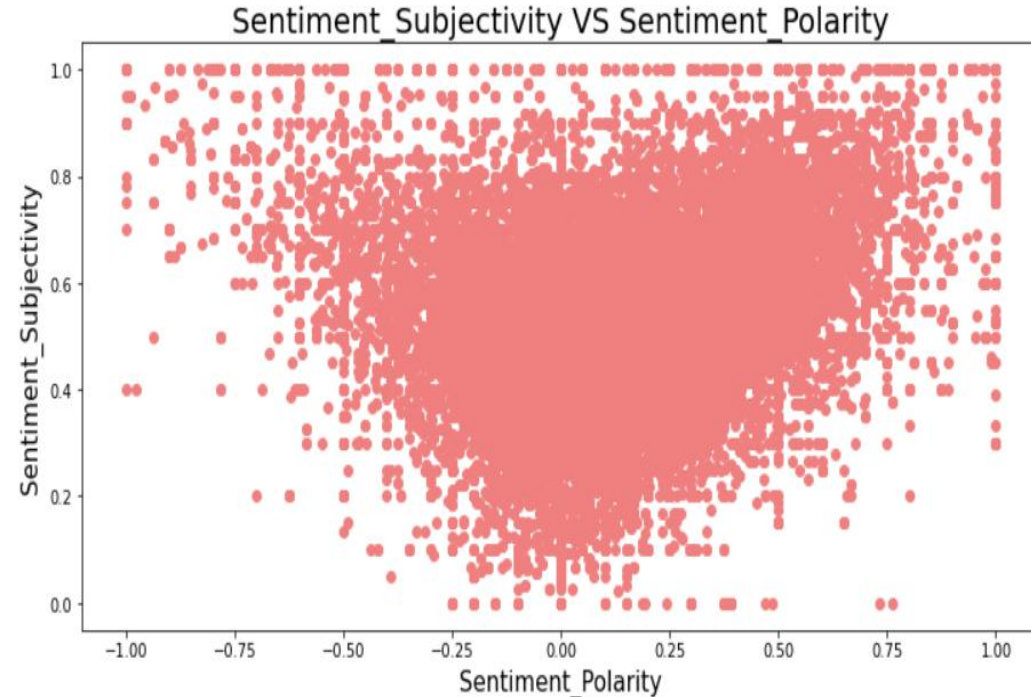
- ❖ we can see from the graph that most of the apps are for “everyone” (Approx 7900) so that it could capture the most of the customer-base.



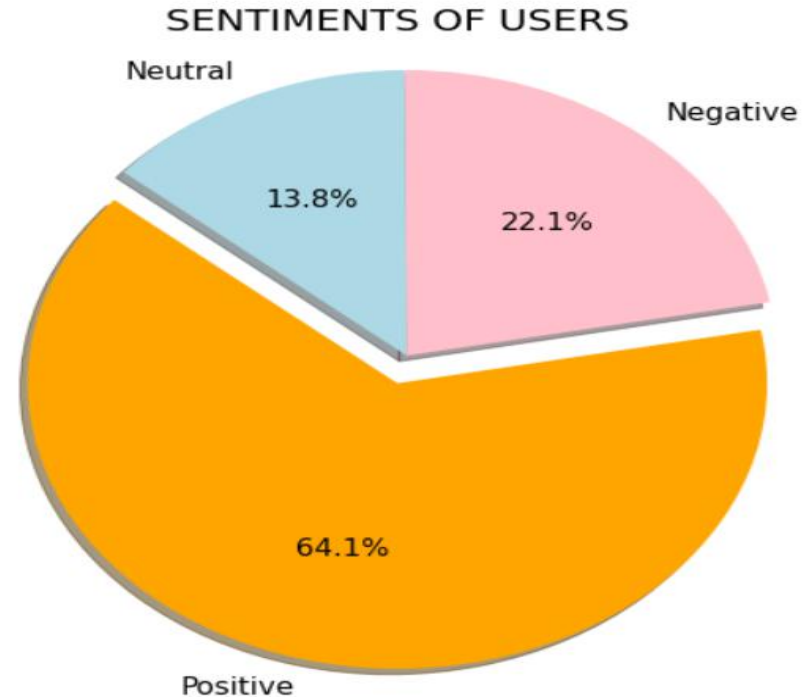
Apps made only for Adults are liked most with an average rating given by them is 4.3

Distribution Sentiment Types

- ❖ The Sentiment subjectivity is not always proportional to sentiment polarity but in maximum number of case, it shows a proportional behavior when variance is too high or low

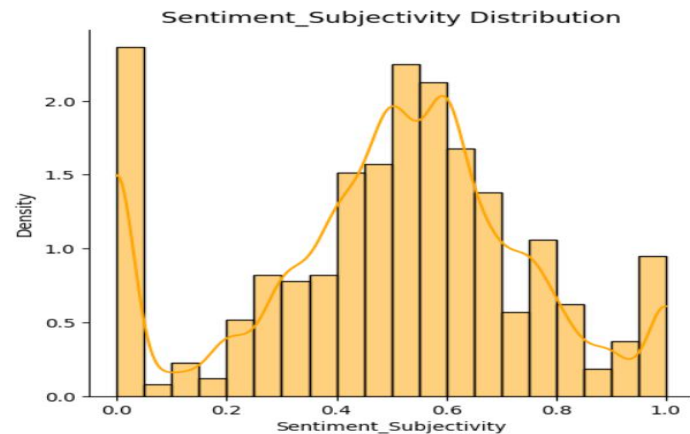
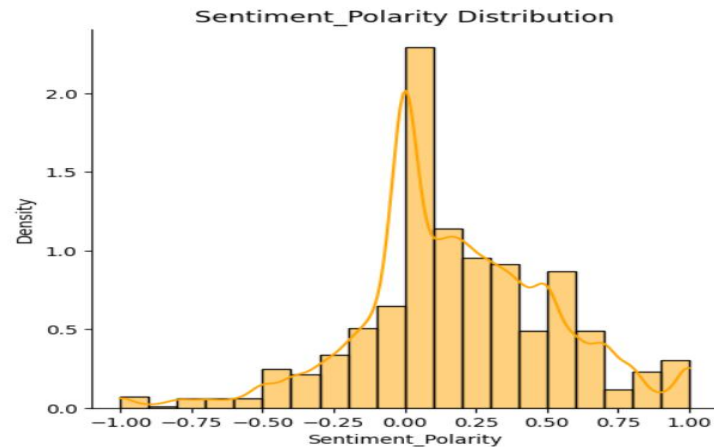
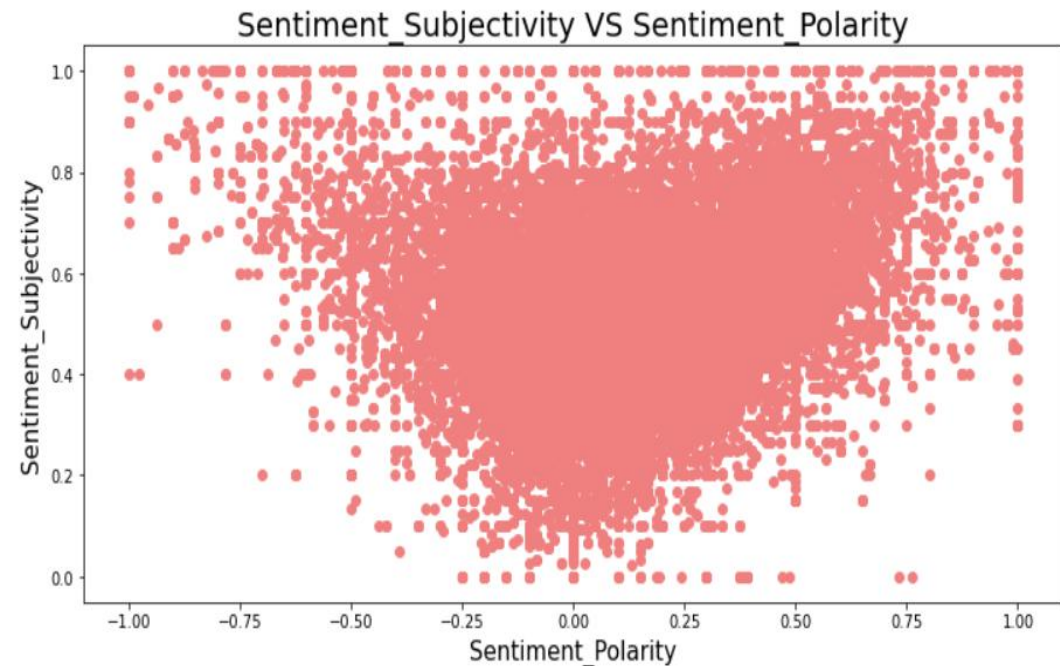


- ❖ Most of the review sentiments are positive and having review percent of 64.1



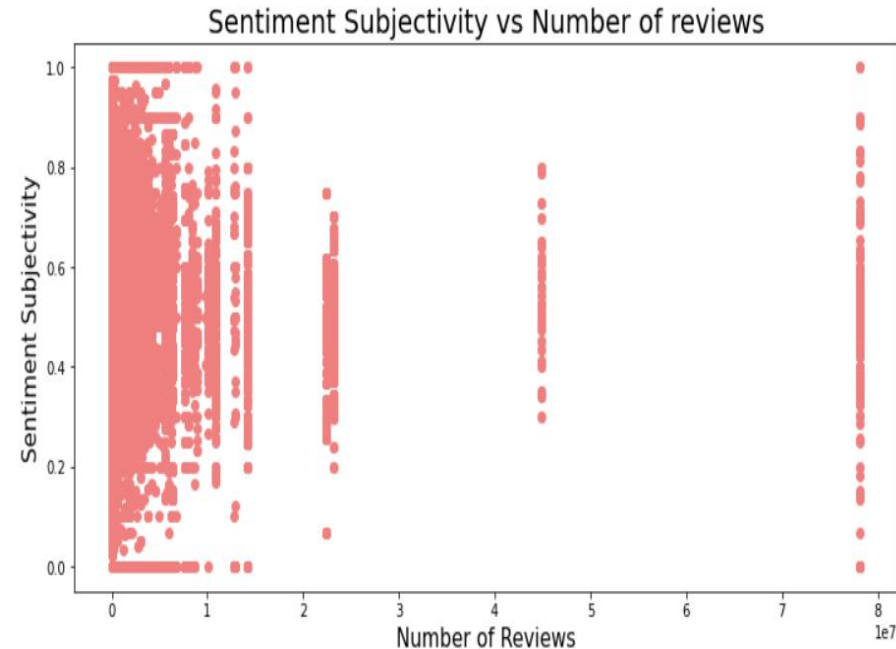
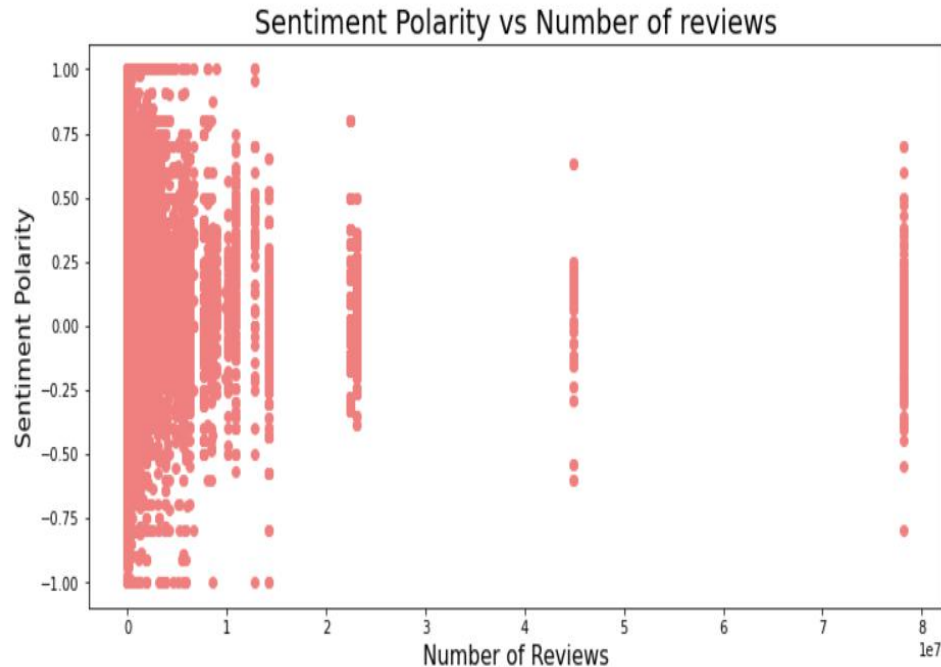
Relation Between Sentiment Polarity And Sentiment Subjectivity

- ❖ The Sentiment subjectivity is not always proportional to sentiment polarity but in maximum number of case, it shows a proportional behavior when variance is too high or low



Relation Between Reviews And Sentiment Polarity/ Subjectivity

- ❖ No definitive relationship between sentiment polarity and number of reviews.
- ❖ Lot of variance in the values of polarity with respect to the number of reviews.
- ❖ Variance in the values of subjectivity with respect to the number of reviews is very high.
- ❖ There is no definitive relationship between sentiment subjectivity and number of reviews.

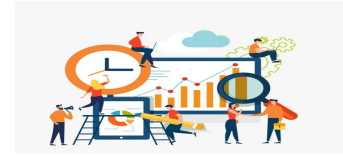


Insights

- ❖ Average number of stars for all apps : **4.1**
- ❖ Total number of apps with 5 star ratings: **271**
- ❖ Category which has highest average rating:
Events, Art and Design, Education
- ❖ Total number of Free and paid Apps
Free 8905 Paid 754
- ❖ Average rating of Free and paid Apps:
Free 4.1 Paid 4.2
- ❖ Maximum reviews - **Facebook**
- ❖ Top Expensive App - **I'm Rich**



Conclusion



- ❖ Users mostly prefer the free apps. App size does not affect the decision of using the paid or free apps much.
- ❖ Family, Games and Tools category have the highest number of apps published on Play store but highest installation is from the Games category.
- ❖ The apps which have the rating above 4 those are actually targetting all the people not a certain age group.
- ❖ Dating, maps, Travel, video player these category apps received the lowest ratings from the user and we know that this apps have high human interaction.
- ❖ On average the application size is in between 10 MB to 30 MB.
- ❖ Family, Game, Communication, Social, Tools, Medical, Events category Apps have the highest earning.
- ❖ Medical, Family, game, Tools apps are the expensive apps.
- ❖ This helps us to understand the application market and invest money in the right categories to make good profits.
- ❖ The sentiment does not influence the final rating of the app because of the proportional behaviour.
- ❖ Popular categories have a more positive sentiment.
- ❖ Positive reviews are higher than negative and neutral but the sentiment subjectivity is not always proportional to sentiment polarity.