Project – Apple app store Analysis

Problem Statement:

We have taken a dataset from Kaggle to analyze the information on the apps available on the app store. This includes the apps name, the sizing (bytes), Ratings, supporting devices, Supported Languages, genres, rating count etc.

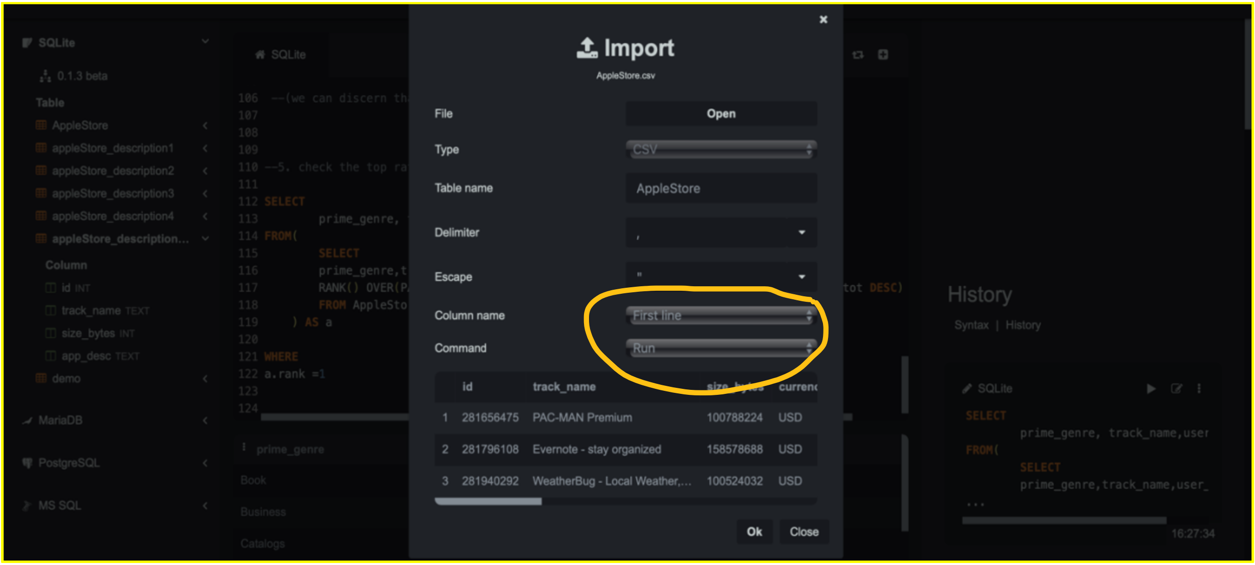
To get an idea of the app descriptions and what these apps do we have taken another dataset that stores all the app descriptions and gives us a lot of information about how the app interfaces with its users and how it could perform in the market.

Connect To Databse:

For the execution of the project and ease of access I have chosen to work with SQL lite, which gives me the ease of analyzing my dataset without and installations necessary.

As an alternative you can also use MySQL workbench and setup a root user and connect to the IDE as a locahhost.

Due to size restrictions, we have had to split the app store descriptions dataset in 4 parts and will **upload** them all individually and rejoin them later using a UNION ALL function.



Import

AppleStore.csv

File: Open

Type: CSV

Table name: AppleStore

Delimiter: ,

Escape: "

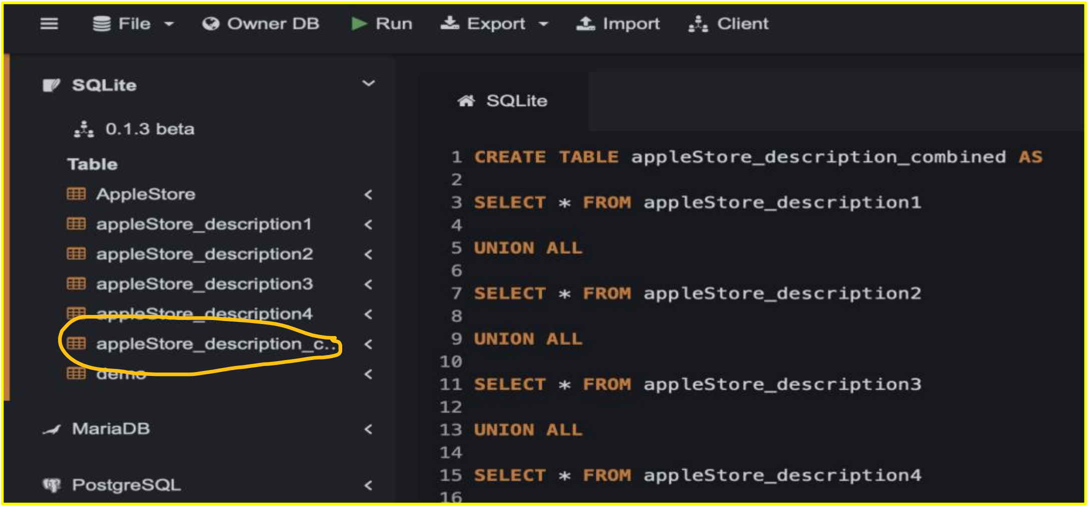
Column name: First line

Command: Run

	id	track_name	size_bytes	currenc
1	281656475	PAC-MAN Premium	100788224	USD
2	281796108	Evernote - stay organized	158578688	USD
3	281940292	WeatherBug - Local Weather,...	100524032	USD

Ok Close

Use the UNION ALL function for combining all the 4 files that we split



```
CREATE TABLE appleStore_description_combined AS

SELECT * FROM appleStore_description1

UNION ALL

SELECT * FROM appleStore_description2

UNION ALL

SELECT * FROM appleStore_description3

UNION ALL

SELECT * FROM appleStore_description4
```

Stakeholders:

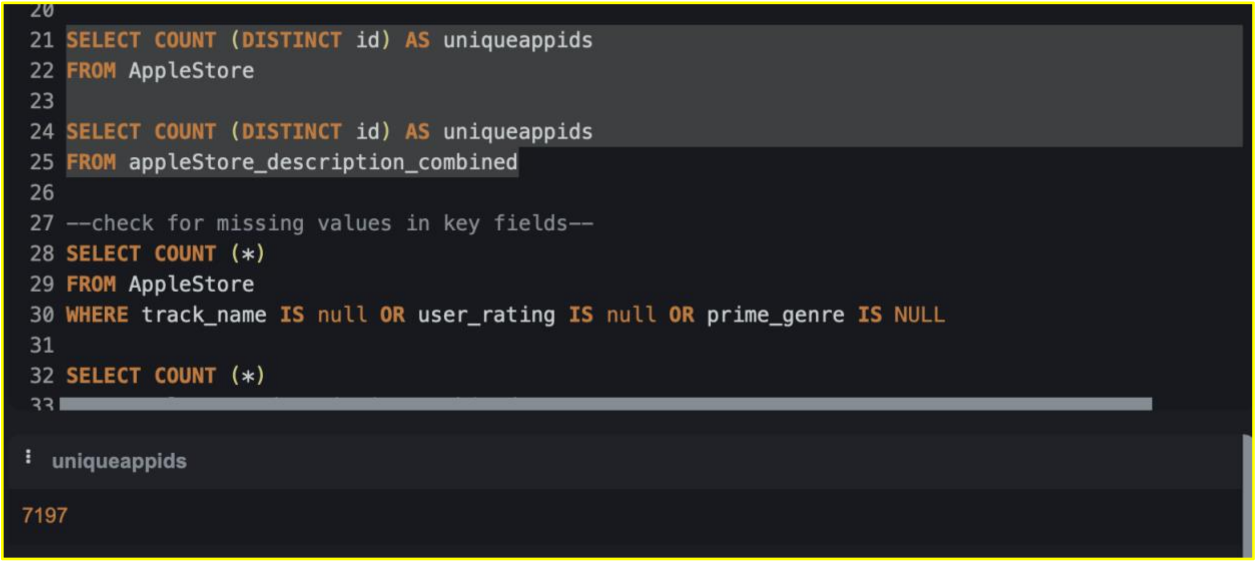
As per our dataset and use case, stakeholders are aspiring app developers the need data driven insights.
To decide what type of app to build and launch, they are seeking answers to questions such as:

1. What price should be set for the app?
2. What categories have the most popular apps based on ratings?
3. How can they maximize rating?

Exploratory Data Analysis:

Aimed at understanding the structure and characteristics of the dataset, it reveals if the dataset happens to have any issues that need to be addressed before further analysis.
Some of the issues can include missing data, incorrect data formats, inconsistent data, errors and outliers.

1. **Check the number of unique apps in both tables.**
   (To ensure we are dealing with the same set of apps in both the datasets, discrepancies could mean missing data in either table)

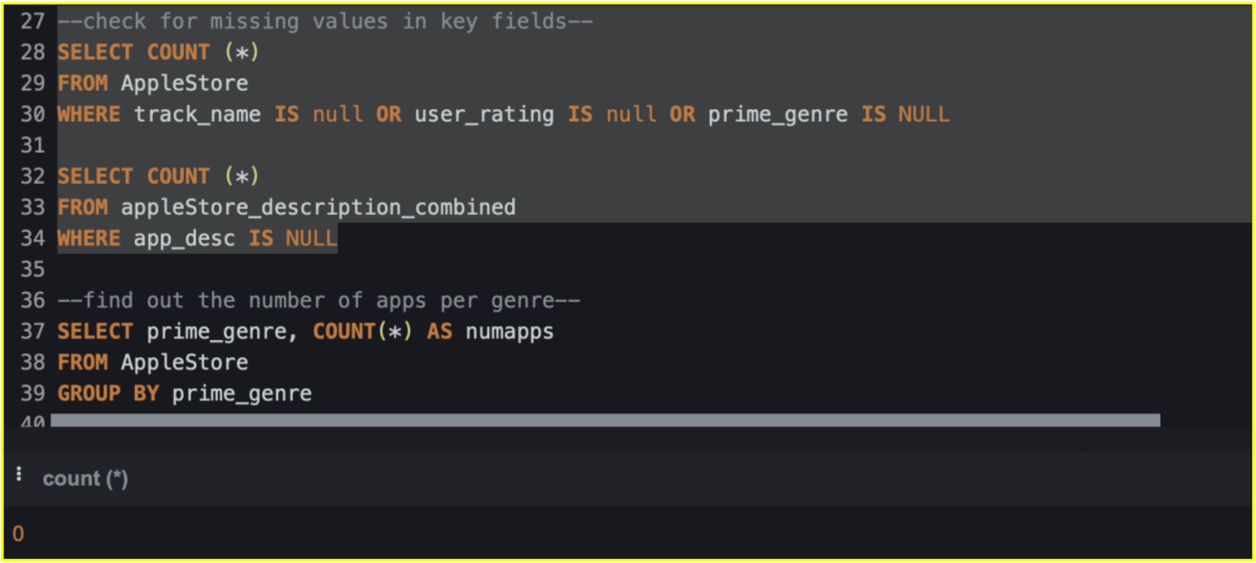


```
SELECT COUNT (DISTINCT id) AS uniqueappids
FROM AppleStore

SELECT COUNT (DISTINCT id) AS uniqueappids
FROM appleStore_description_combined

--check for missing values in key fields--
SELECT COUNT (*)
FROM AppleStore
WHERE track_name IS null OR user_rating IS null OR prime_genre IS NULL

SELECT COUNT (*)
```

```
uniqueappids
7197
```

We can discern that both numbers are same so we conclude there is no missing data between the two datasets

2. **Check if values are missing in a few key columns.**
   (we are taking the prime genre, rating and track name for the apple store dataset and app description column for the app description dataset)

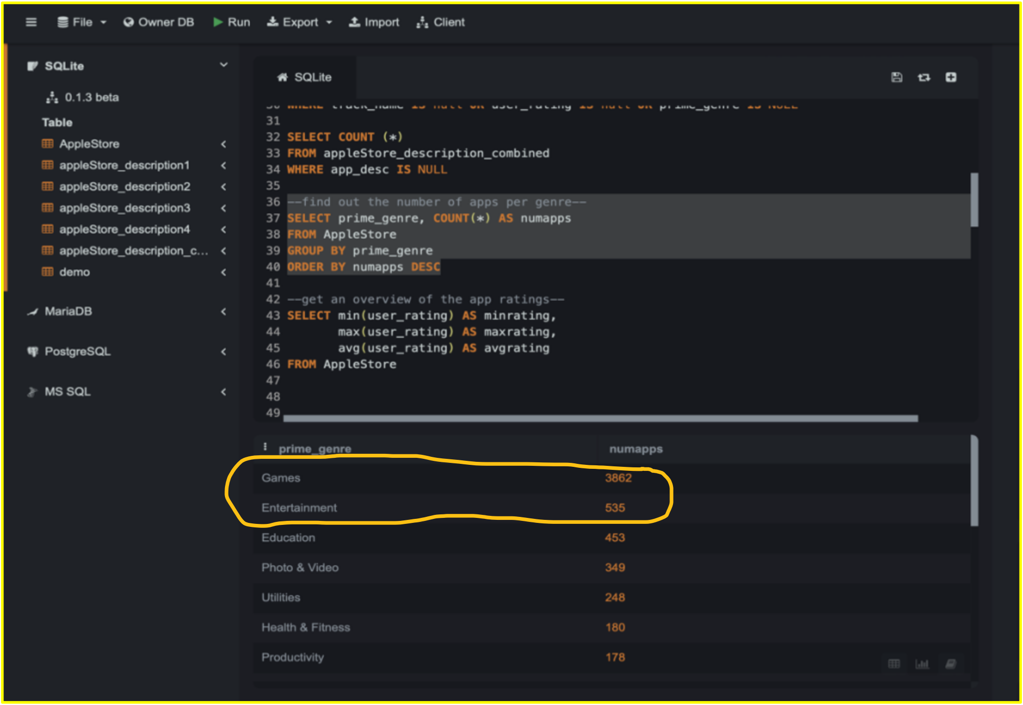


```
--check for missing values in key fields--
SELECT COUNT (*)
FROM AppleStore
WHERE track_name IS null OR user_rating IS null OR prime_genre IS NULL

SELECT COUNT (*)
FROM appleStore_description_combined
WHERE app_desc IS NULL

--find out the number of apps per genre--
SELECT prime_genre, COUNT(*) AS numapps
FROM AppleStore
GROUP BY prime_genre
```

```
count (*)
0
```

Here, the count is 0 for both the tables so we can conclude that there are no missing values.

3. **Find out the number of apps per genre.**
   (Gives us a nice overview of the genre distribution in the Appstore, helping us identify dominant genres)

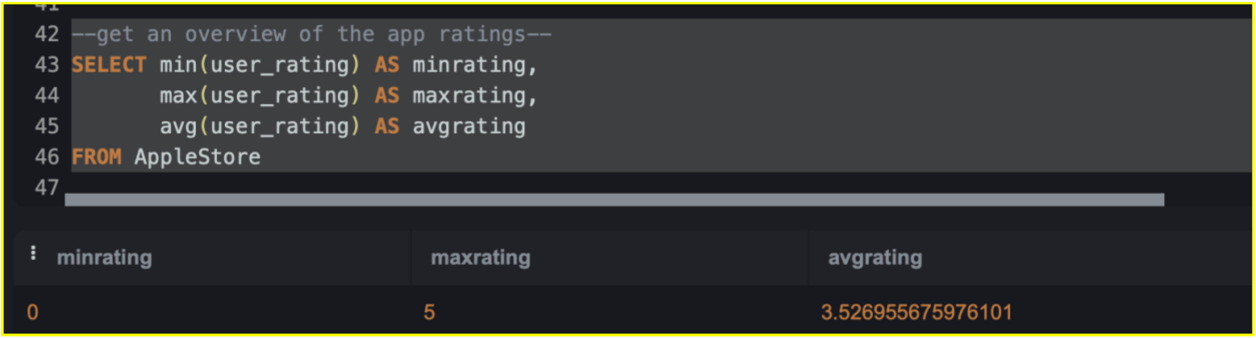


```sql
WHERE track_name IS null OR user_rating IS null OR prime_genre IS NULL

SELECT COUNT (*)
FROM appleStore_description_combined
WHERE app_desc IS NULL

--find out the number of apps per genre--
SELECT prime_genre, COUNT(*) AS numapps
FROM AppleStore
GROUP BY prime_genre
ORDER BY numapps DESC

--get an overview of the app ratings--
SELECT min(user_rating) AS minrating,
       max(user_rating) AS maxrating,
       avg(user_rating) AS avgrating
FROM AppleStore
```

prime_genre	numapps
Games	3862
Entertainment	535
Education	453
Photo & Video	349
Utilities	248
Health & Fitness	180
Productivity	178

We see that the Games & Entertainment industry is clearly leading with the number of apps present in the Appstore.

4. Get an overview of the rating trends of the Appstore.
(We will take some basic measures such as the minimum, maximum and average of the user ratings)



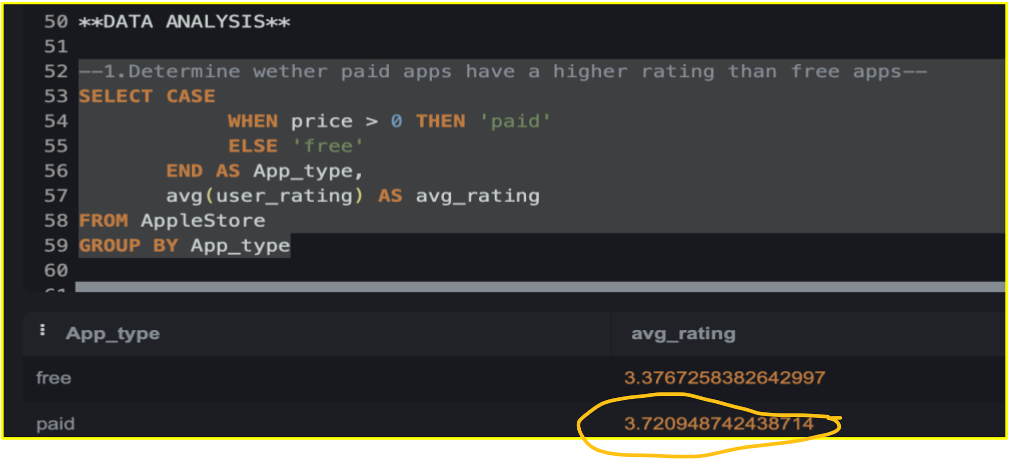
```sql
--get an overview of the app ratings--
SELECT min(user_rating) AS minrating,
       max(user_rating) AS maxrating,
       avg(user_rating) AS avgrating
FROM AppleStore
```

minrating	maxrating	avgrating
0	5	3.526955675976101

The average rating is 3.52, the maximum being 5.

Finding Insights and Data Analysis:

a. Do paid apps have a higher rating than free apps?
(To determine this, we will use a CASE WHEN statement and select the average user rating)

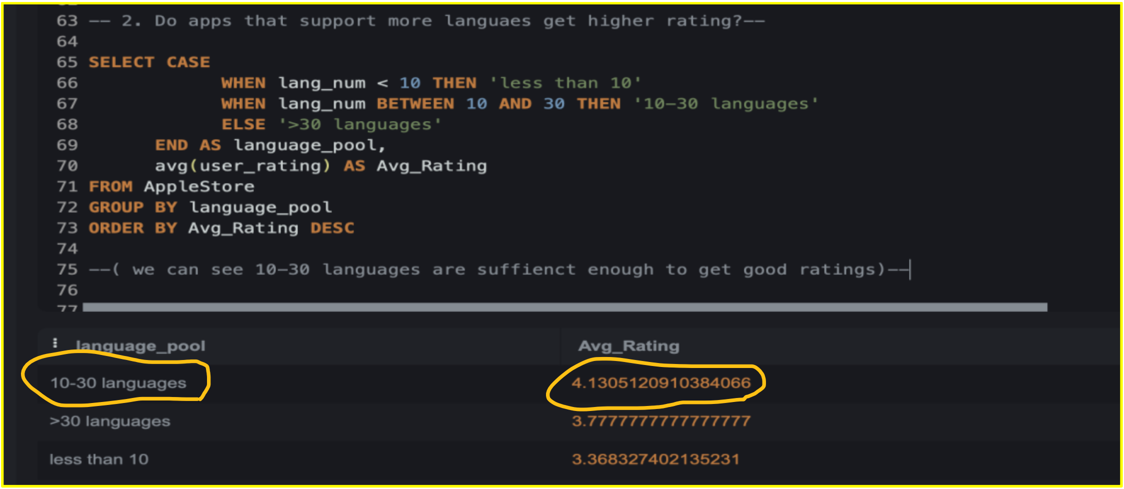


```sql
**DATA ANALYSIS**

--1.Determine wether paid apps have a higher rating than free apps--
SELECT CASE
            WHEN price > 0 THEN 'paid'
            ELSE 'free'
       END AS App_type,
       avg(user_rating) AS avg_rating
FROM AppleStore
GROUP BY App_type
```

```
App_type                                      avg_rating
free                                          3.3767258382642997
paid                                          3.720948742438714
```

On an average the ratings of **paid apps are slightly higher** that free apps.

b. **Determine of apps with a greater number of supported languages get higher ratings?**
(To determine this, we will use a CASE WHEN statement and select the average user rating)

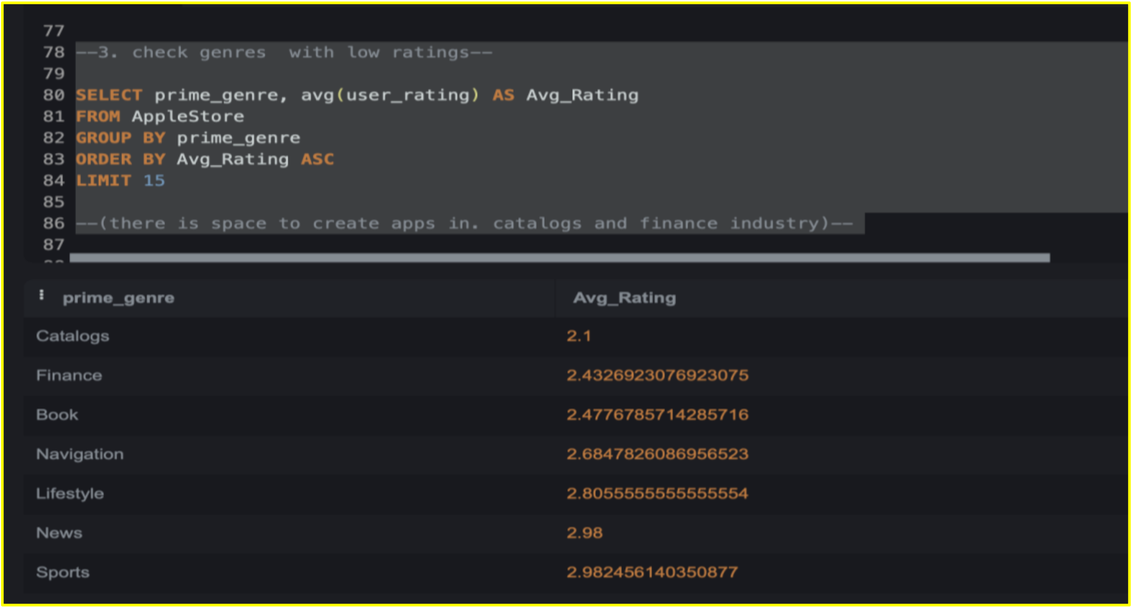


```sql
-- 2. Do apps that support more languaes get higher rating?--

SELECT CASE
            WHEN lang_num < 10 THEN 'less than 10'
            WHEN lang_num BETWEEN 10 AND 30 THEN '10-30 languages'
            ELSE '>30 languages'
       END AS language_pool,
       avg(user_rating) AS Avg_Rating
FROM AppleStore
GROUP BY language_pool
ORDER BY Avg_Rating DESC

--( we can see 10-30 languages are suffienct enough to get good ratings)--
```

```
language_pool                                 Avg_Rating
10-30 languages                               4.1305120910384066
>30 languages                                 3.7777777777777777
less than 10                                  3.368327402135231
```

Based on the language bucket with range of 10-30 having the highest ratings we can conclude that we don't need to focus hard on language support barring a few essential and popular languages.

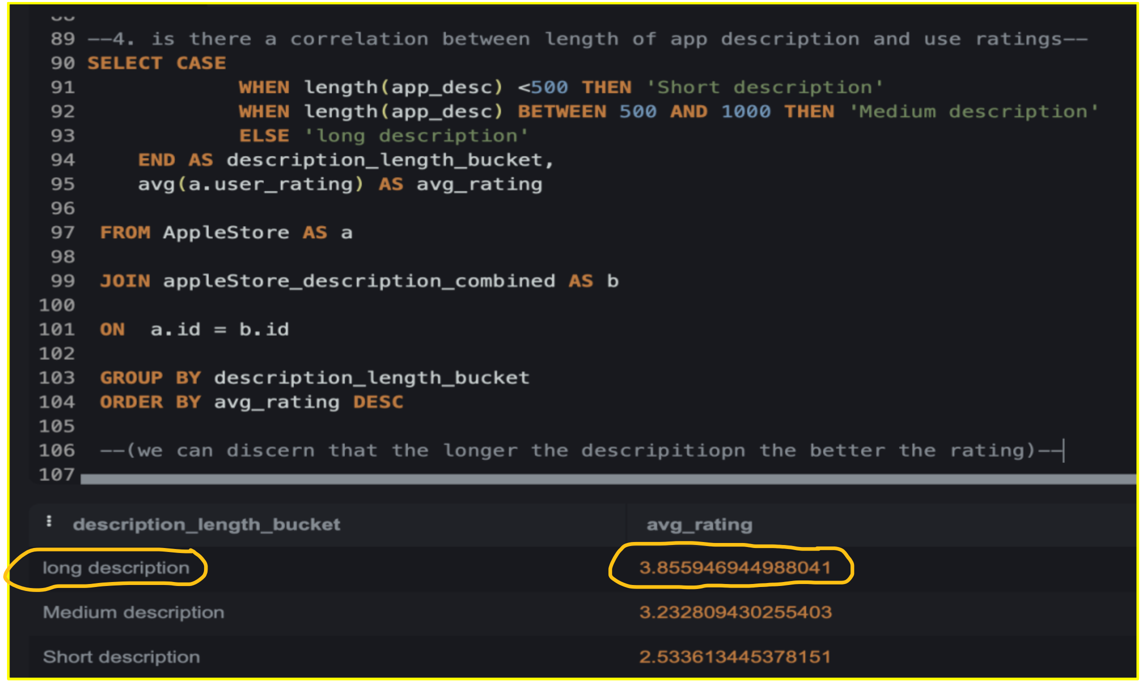
c. **Check the top 15 genres with the least ratings.**
(Low ratings indicate that the users are unhappy that their demands are not being met and there is a good chance to create a successful app in this space)



```sql
--3. check genres  with low ratings--

SELECT prime_genre, avg(user_rating) AS Avg_Rating
FROM AppleStore
GROUP BY prime_genre
ORDER BY Avg_Rating ASC
LIMIT 15

--(there is space to create apps in. catalogs and finance industry)--
```

prime_genre	Avg_Rating
Catalogs	2.1
Finance	2.4326923076923075
Book	2.4776785714285716
Navigation	2.6847826086956523
Lifestyle	2.8055555555555554
News	2.98
Sports	2.982456140350877

d. Check for correlation between app description length and user ratings.
*(We will JOIN the **id column** in both tables and use a CASE -WHEN -END statement to define a character length condition)*



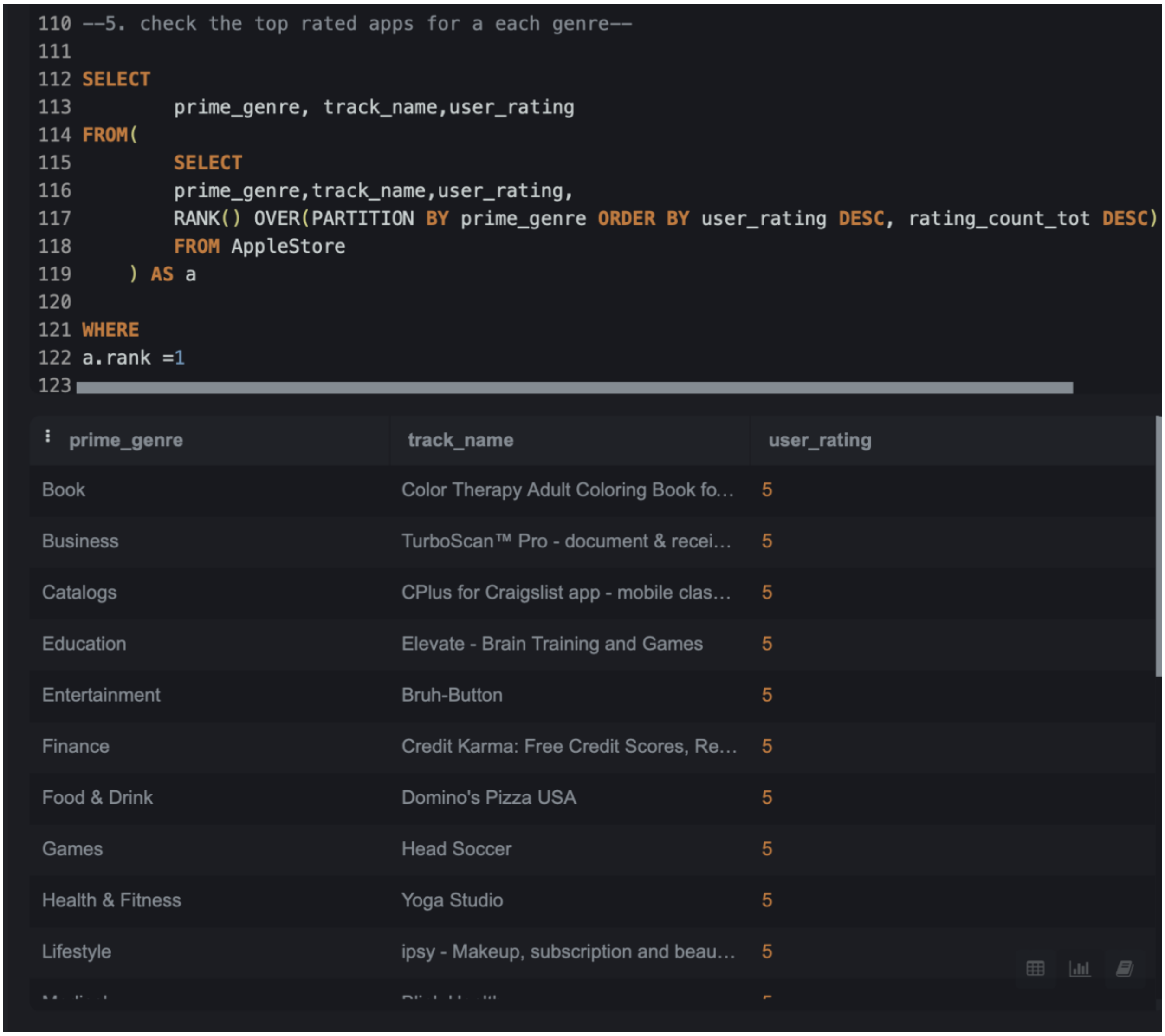
```sql
--4. is there a correlation between length of app description and use ratings--
SELECT CASE
            WHEN length(app_desc) <500 THEN 'Short description'
            WHEN length(app_desc) BETWEEN 500 AND 1000 THEN 'Medium description'
            ELSE 'long description'
    END AS description_length_bucket,
    avg(a.user_rating) AS avg_rating

 FROM AppleStore AS a

 JOIN appleStore_description_combined AS b

 ON  a.id = b.id

 GROUP BY description_length_bucket
 ORDER BY avg_rating DESC

 --(we can discern that the longer the descripitiopn the better the rating)--
```

description_length_bucket	avg_rating
long description	3.855946944988041
Medium description	3.232809430255403
Short description	2.533613445378151

We have found a positive correlation between the app descriptions length and the user ratings.

We can understand that the users prefer to get a good understanding of the app features before they install the applications.

e. **Check the top-rated apps for each genre.**
(we use the RANK function to assign a rank to a partition of genres ordered by the user ratings)



```
--5. check the top rated apps for a each genre--

SELECT
        prime_genre, track_name,user_rating
FROM(
        SELECT
        prime_genre,track_name,user_rating,
        RANK() OVER(PARTITION BY prime_genre ORDER BY user_rating DESC, rating_count_tot DESC)
        FROM AppleStore
    ) AS a

WHERE
a.rank =1
```

prime_genre	track_name	user_rating
Book	Color Therapy Adult Coloring Book fo…	5
Business	TurboScan™ Pro - document & recei…	5
Catalogs	CPlus for Craigslist app - mobile clas…	5
Education	Elevate - Brain Training and Games	5
Entertainment	Bruh-Button	5
Finance	Credit Karma: Free Credit Scores, Re…	5
Food & Drink	Domino's Pizza USA	5
Games	Head Soccer	5
Health & Fitness	Yoga Studio	5
Lifestyle	ipsy - Makeup, subscription and beau…	5
Medical	Blink Health	5

a.rank=1 selects only the observations with rank 1 or top row, it means it selects the highest rated apps from each genres, to break rank ties we use the total user ratings column.

We can look at top performing apps, which is a nice insight for a anyone to emulate the design flow to get better functionality and ratings.

Final Recommendations:

- Paid apps have a better rating than free apps,

  - This could be due to a slew of reasons such as, users engaging more and perceiving value leading to better ratings.
  - We recommend charging a small fee if the perceived app quality is good.

- Apps supporting a moderate number of languages (10-30) receive higher ratings.
  - We recommend that language quantity is not important, rather proving the widely spoken ones are.

- Finance and Books genres have very low user ratings, which means user demands are not being met.
  - This represents an opportunity to deliver a quality app in these segments, that better matches user requirements
  - This will stand a much better chance of getting a high user rating and effective market penetration.

- Length of the app description has a direct correlation with the app ratings.
  - This means that users want a clear explanation of the app functionality, features and capabilities.
  - A detailed, well-crafted app description can help set user expectations, boosting user satisfaction.

- On an average the rating for an app is 3.5
  - So, a new app should aim for achieving a higher rating than 3.5 to be better.

- Games and Entertainment genres have the highest number of functioning apps, which indicates that is area is saturated.
  - Entering these spaces may be challenging due to high competition.
  - However, it clearly indicates high demand in these sectors also.