SMARTPHONES SALES DATA ANALYSIS PROJECT

By Lakshita Chawla

Introduction

In the rapidly evolving world of technology, smartphones have become an essential part of modern life. Understanding the dynamics of smartphone sales is crucial for stakeholders in the tech industry, including manufacturers, retailers, and consumers. Analyzing sales data provides insights into market trends, customer preferences, and pricing strategies.

This analysis aims to explore various aspects of smartphone sales data to uncover patterns and trends that can inform business decisions and strategic planning.

The primary objectives of this analysis are:

1. Understanding the distribution of selling prices and Identifying pricing patterns across different brands.
2. Analyze how discounts affect the selling price and profit margins of smartphones.
3. Compare the average selling prices, ratings, and market share of different smartphone brands.
4. Investigate the relationship between smartphone features (e.g., storage, camera) and consumer ratings.
5. Explore how the original price of smartphones correlates with the profit generated.

Workflow

This Project is Based on Analyzing Smartphone Sales Data

1. Identifying the problem and collecting raw data to analyze it further.
2. Cleaning the data by removing unwanted columns and outliers.
3. Using Python and its extended libraries to code and extract results from the raw data.
4. Visualizing the data using different types of graphs on various factors.
5. Concluding with analyzing the data based on the raw dataset.

Attributes in the Study

Column Names

1. Brands
2. Models
3. Colors
4. Memory
5. Storage
6. Camera
7. Rating
8. Selling Price
9. Original Price
10. Mobile
11. Discount
12. discount percentage

Data Wrangling

Data Cleaning:-

Dropping Column with Maximum Null values– Memory

Columns with nominal null values have been manipulated by filling them with

➔ Numerical column:- Median (Rating)

Data Manipulation:-

Combining columns with an specific operation for an effective study

➔ Discounted Price = Selling Price - Discount

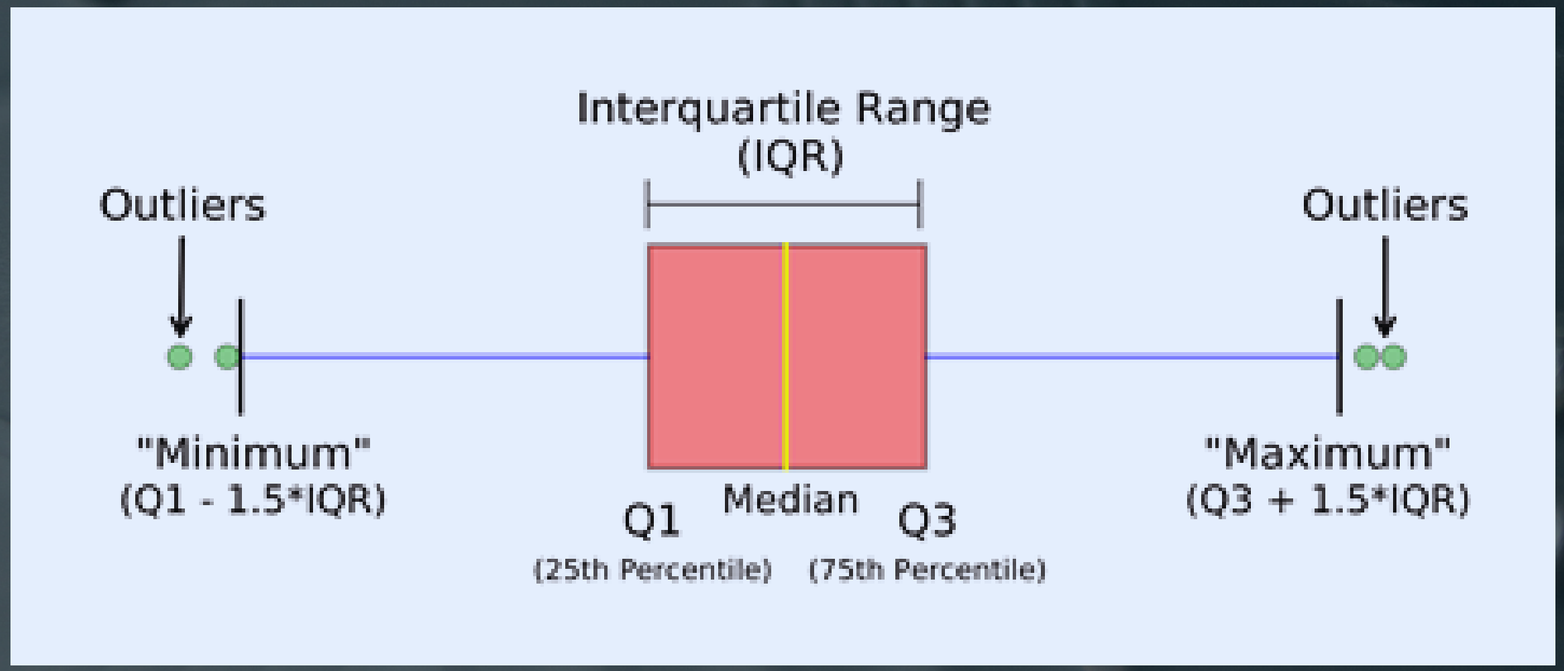
➔ Profit= Original Price - Discounted Price

Handling Outliers

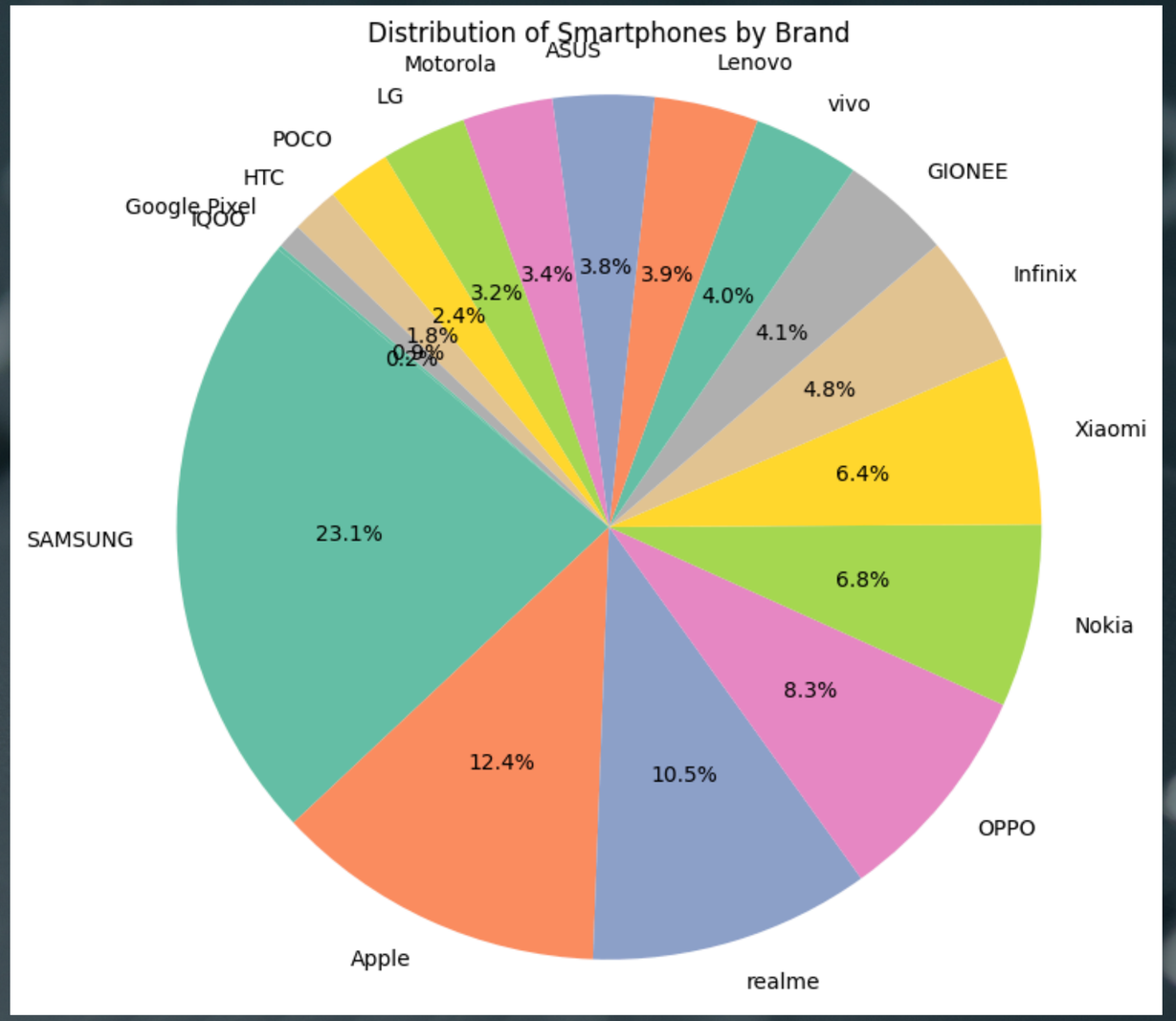
Outliers are data points that deviate significantly from the rest of the observations in a dataset. They can occur due to variability in the data, measurement errors, or other anomalies. Outliers can have a substantial impact on statistical analyses and models, potentially skewing results and leading to incorrect conclusions.

The Interquartile Range (IQR) method is a statistical technique used to identify and handle outliers.

The IQR is a measure of statistical dispersion and is calculated as the difference between the third quartile (Q3) and the first quartile (Q1) of the data.



Distribution of Smartphones by Brand



Samsung has the largest share of smartphones in the dataset.

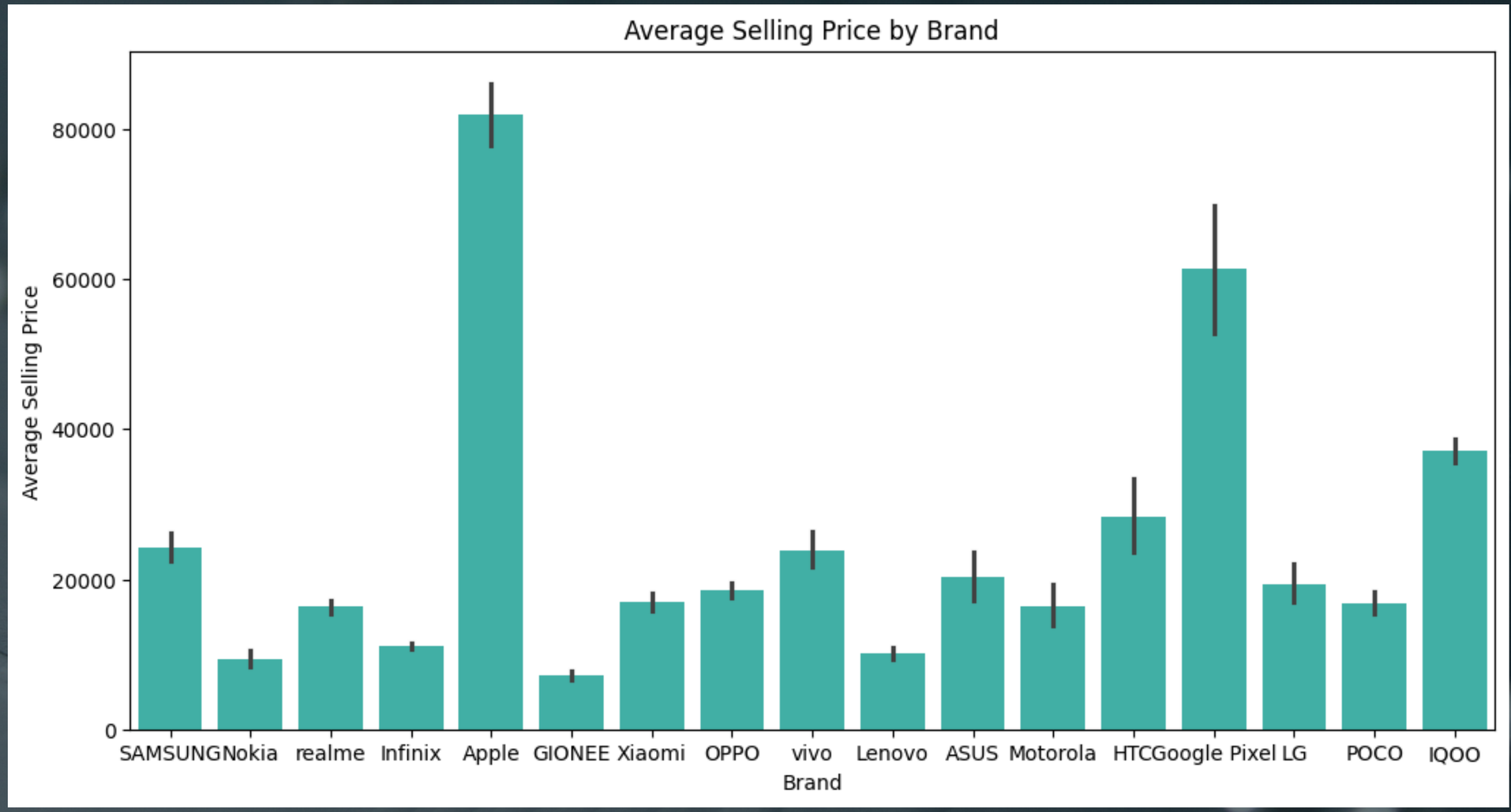
Google Pixel and IQOO have smaller shares, indicating their presence in fewer models.

Distribution of Selling Prices for Smartphones

As per the study the most preferred smartphones are priced less than 25000

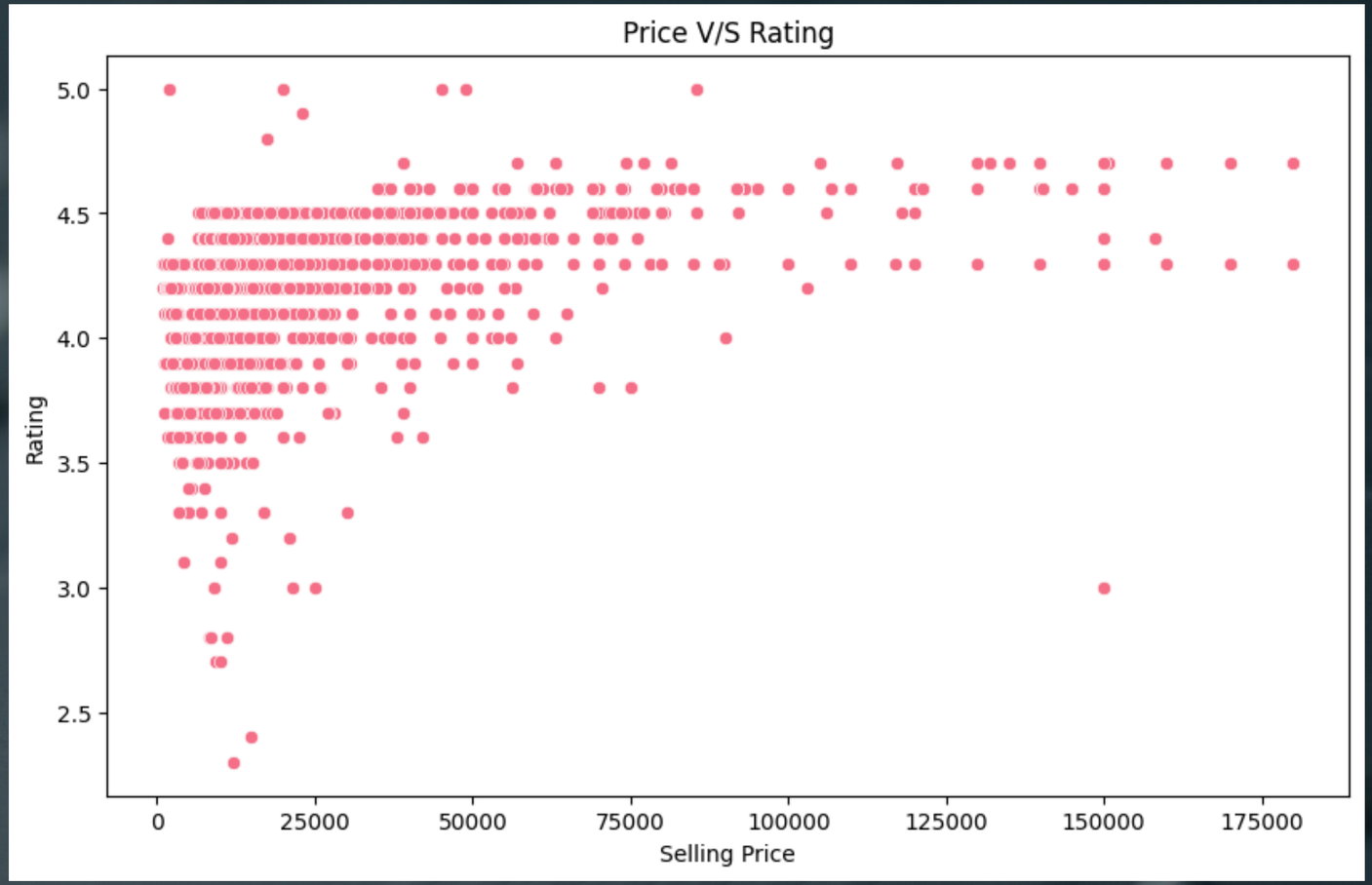
This suggests that most smartphones in the dataset are priced in the lower to mid-range segment, with fewer high-end models.

Average Selling Price by Brand



Apple has the highest average selling price, indicating it might be positioned in the premium segment.
Nokia and Gionee have lower average selling prices, suggesting they might focus on more affordable models.

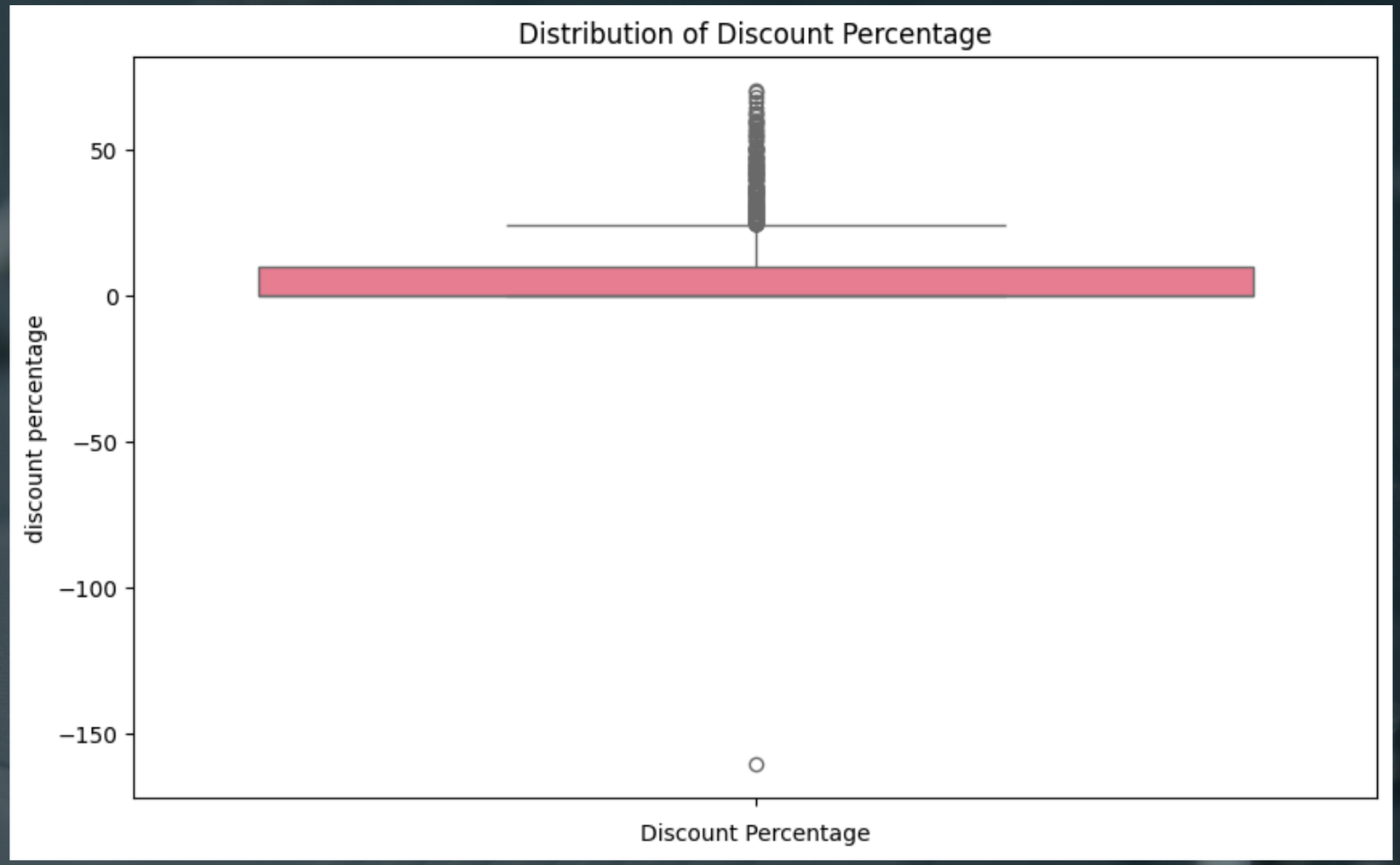
Variation of Rating on the Basis of Selling Price



There appears to be a positive correlation between selling price and rating, suggesting that higher-priced smartphones tend to have higher ratings.

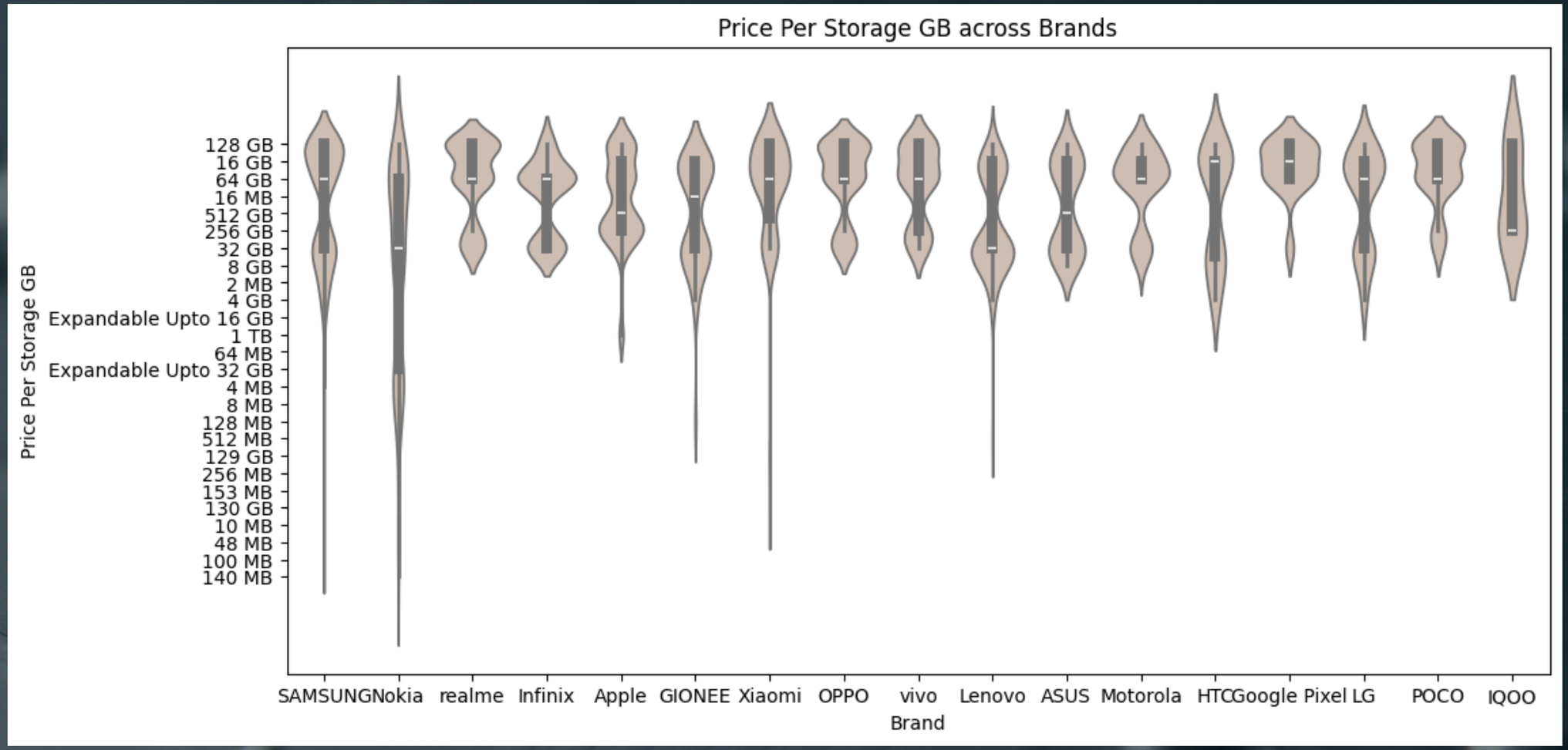
However, the relationship is not perfect, and some high-priced smartphones have relatively lower ratings, indicating variability in consumer satisfaction.

Distribution of Discount Percentages for Smartphones



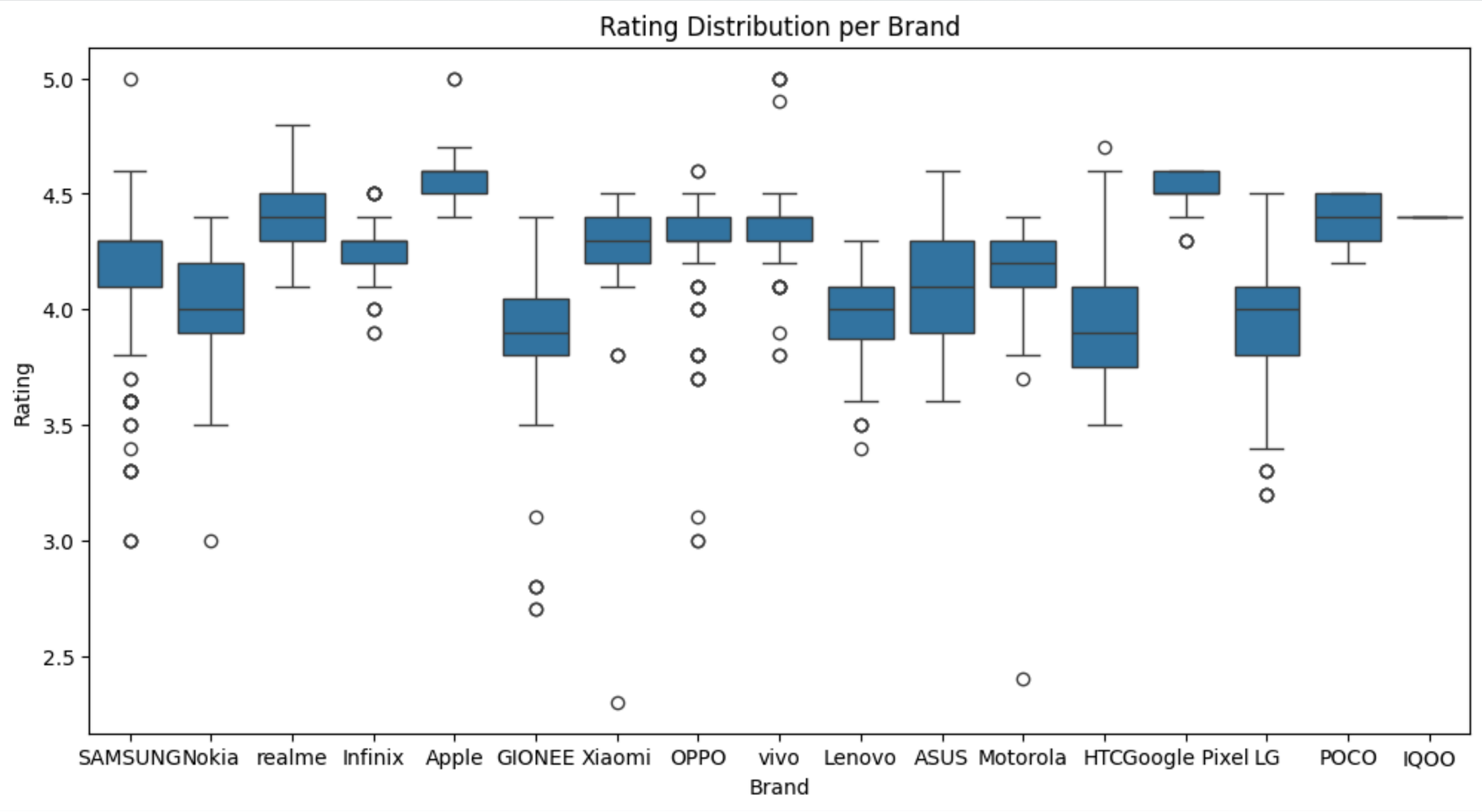
The discount percentages vary significantly across the dataset.
The presence of outliers suggests that some smartphones receive exceptionally high discounts compared to others.

Distribution of Price Per Storage GB across Different Brands



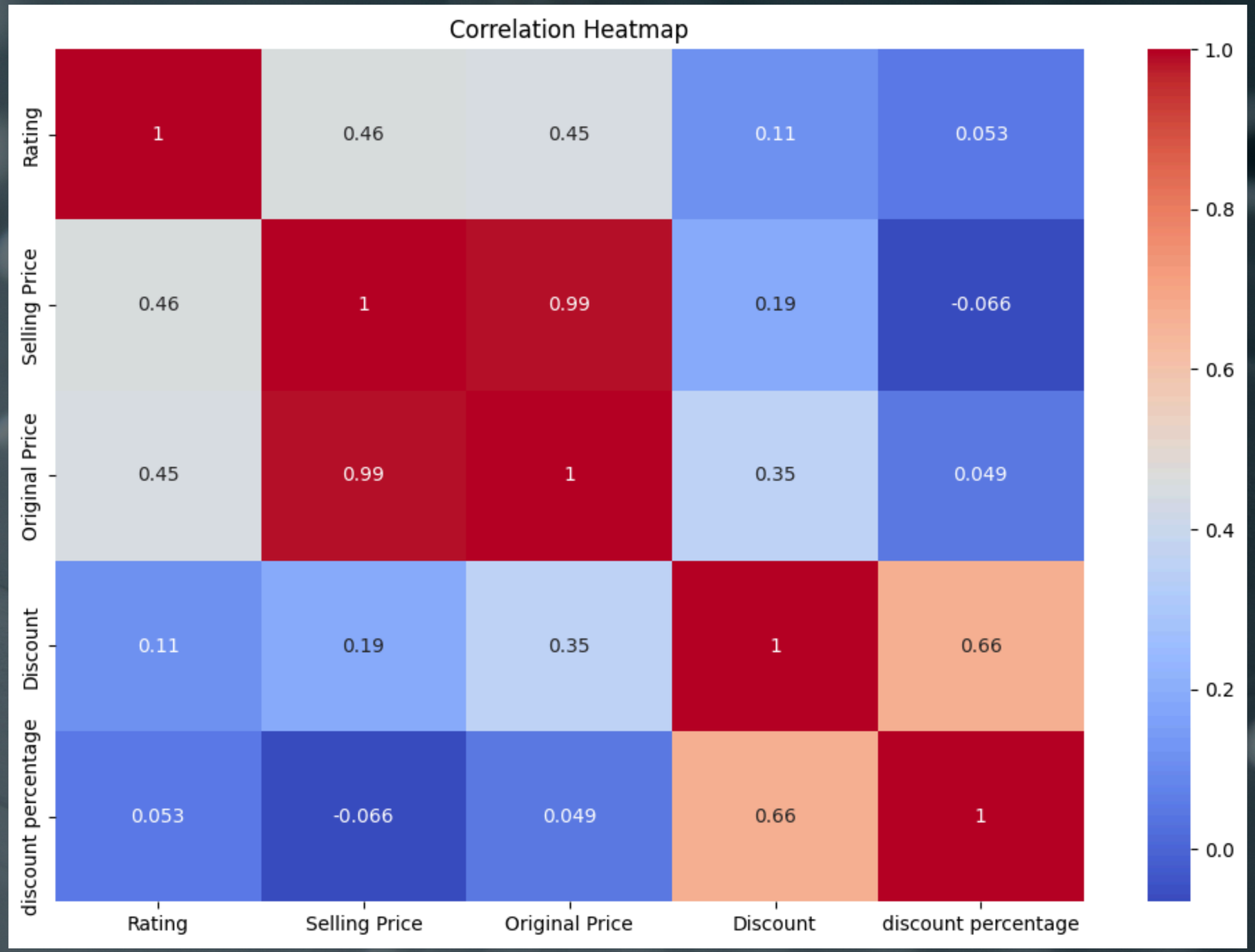
Nokia and Xiaomi have narrower distributions, indicating more consistency in pricing relative to storage. Google Pixel exhibits a wider distribution, suggesting variability in pricing for storage across different models within the brand.

Distribution of Ratings Across Different Brands



Ratings vary by brand, with some brands showing a wider range of ratings.
Apple and Google Pixel appear to have higher ratings on average compared to other brands, indicating better overall customer satisfaction.

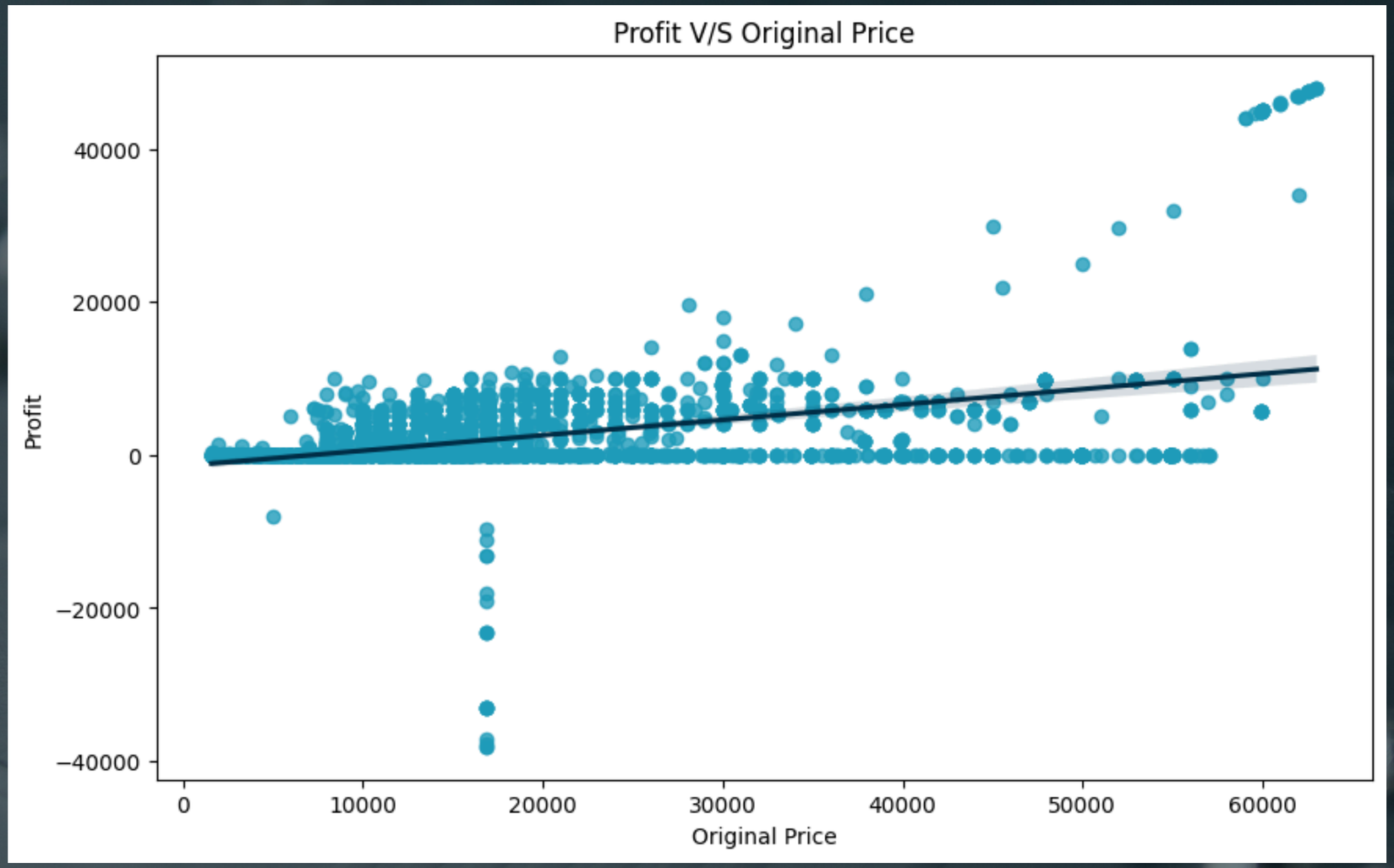
Correlation Heatmap of Smartphone Features



A strong positive correlation exists between Original Price and Selling Price, which is expected.

Another correlations include between Discount and Discount Percentage, indicating that larger discounts generally correspond to higher discount percentages.

Variation of Profit Based on Original Price



There is a positive trend, suggesting that higher original prices tend to result in higher profits. However, some models with high original prices have relatively lower profits, indicating potential inefficiencies or pricing strategies.

Observations

After analyzing the Smartphones Sales Data the following observations have been made:-

- The pie chart depicting **Distributions of Smartphones by Brands** shows that **Samsung** has the largest share of smartphones in the dataset, followed by **Apple and Realme**. This suggests Samsung has a broader market presence.
- The histogram and KDE plot depicting **Distribution of Selling Prices for Smartphones** reveal that the selling prices are predominantly concentrated in the **lower to mid-price range**, with fewer high-end models.
- The bar plot depicting **Average Selling Price by Brand** shows that **Apple** has the highest average selling price, indicating it is positioned in the premium segment. **Nokia** and **Gionee** have lower average selling prices, suggesting they focus on more affordable models.
- The scatter plot depicting **Variation of Rating on the basis of Selling Price** indicates a positive correlation between selling price and rating, suggesting that **higher-priced smartphones generally receive higher ratings**. However, there is variability, with some expensive models receiving lower ratings.
- The box plot depicting **Distribution of Discount Percentages of Smartphones** indicates significant variation in discount percentages across smartphones, with some models receiving exceptionally high discounts. This variability suggests different discounting strategies or seasonal promotions.

Observations

After analyzing the Smartphones Sales Data the following observations have been made:-

- The violin plot depicting **Distribution of Price Per Storage GB across Different Brands** shows that **Nokia and Xiaomi** have more consistent pricing relative to storage, while **Google Pixel** has more variability. This indicates that Google Pixel offers a wider range of models with varying storage prices.
- The box plot depicting **Distribution of Ratings Across Different Brands** highlights that **Apple and Google Pixel** generally receive higher ratings, indicating better overall customer satisfaction. Other brands show a wider range of ratings, suggesting mixed customer feedback.
- The heatmap depicting **Correlation between Heatmap of Smartphone Features** reveals strong positive correlations between Original Price and Selling Price, as well as between Discount and Discount Percentage. These correlations are expected and indicate that **higher discounts generally correspond to higher discount percentages**.
- The scatter plot depicting **Variation of Profit based on Original Price** with a regression line suggests a **positive trend** between original price and profit, indicating that higher original prices tend to **yield higher profits**. However, there are exceptions, with some high-priced models generating lower profits.

Conclusion

After analyzing the Smartphones Sales Data the following conclusions have been made:-

- The majority of smartphones are priced in the **lower to mid-range**, indicating a competitive market with many affordable options.
- **Higher-priced** smartphones tend to have **better ratings**, but this is not always consistent, highlighting the importance of maintaining quality across all price segments.
- **Apple** stands out with higher average selling prices and better customer ratings, positioning it in the premium segment.
- **Samsung** has the largest market share, suggesting it has a strong presence in the affordable segment.
- Significant **variations in discount percentages** suggest different discounting strategies, potentially influenced by market conditions or promotional campaigns.
- The **positive correlation** between discounts and discount percentages can help in planning future discount strategies to **maximize sales and profits**.
- Customer ratings vary widely across brands, with **Apple** generally receiving higher ratings. This indicates the importance of maintaining product quality to achieve higher customer satisfaction.
- Higher original prices generally lead to higher profits, but there are exceptions. This suggests a need for careful pricing strategies to **balance between profit margins and customer demand**.


Thank
you!