SMART SEARCH FOR ONLINE PURCHASE
FEYNN LABS

In the rapidly evolving landscape of e-commerce, the ability to efficiently and effectively find products online is paramount to success. Our Team has developed an innovative solution called "**Smart Search for Online Purchase**" designed to enhance the online shopping experience by providing users with a more intuitive and streamlined way to locate the products they desire.

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Smart Search for Online Purchase

By **SWAPNIL DHAGE**

Introduction

The global smartphone market has one of the constant sectors changing very fast in the technology industry. With continuous product launches, companies have been working hard to bring innovations to grab a share of the market across the different regions and price segments. This report analyzes the segmentation of smartphone launches by brand, operating system, price segment, and geographical region. Data analysis furnishes an insight into the kinds of strategies other brands use and what consumers in different markets like.

Problem Statement

The smartphone market is very competitive, with a number of brands trying to make a breakthrough with models in different price segments for different regions. This paper reports on the analysis of launches of smartphones to understand the distribution by price segment, operating system, brand, and region. The report looks at those factors to identify trends in positioning in the market and preferences by consumers, which shall be useful in making strategic decisions in product development and marketing.

Data Overview

This dataset contains information on the launches of smartphones and includes attributes such as brand, OS, country, price range, and the number of offers found. The segmentation of these attributes will give further insights into the variability and concentration of smartphone models available within the market.

1. **Segmentation by Price Segment**

The smartphone market is segmented into several different price categories, ranging from low-end to high-end and premium devices. Analyzing the distribution of different segments across these categories providesa good overview of focus areas for different brands and indicates where bulk consumer demand .

2. **Segmentation by Operating End**

Operating systems form an intrinsic part of a smartphone, and major players include iOS and Android. This analysis should, therefore, present visibility into what types of shares are there between each operating system, the shares across regions.

3. **Brand and Price-Point Segment**

The brands are offered to customers in price segments ranging from budget to premium. This section explores the positioning of various brands within these segments. It indicates which brands are leaders in each category and how they are distributed across the market.

4. **Segmentation by Region and Price Segment**

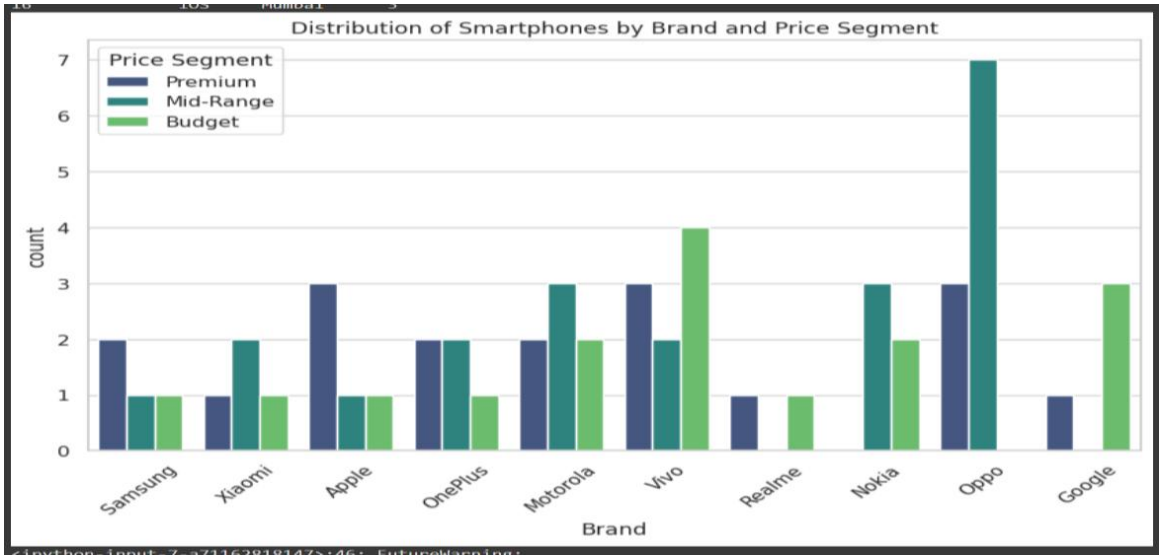
It's more about giving importance to the regional analysis, as different parts of the world seem to adopt different trends in smartphone launches. For instance, it pinpoints the key regions that different price segments are targeting and comprehends the regional market dynamics.

5. Operating System and Region Segmentation

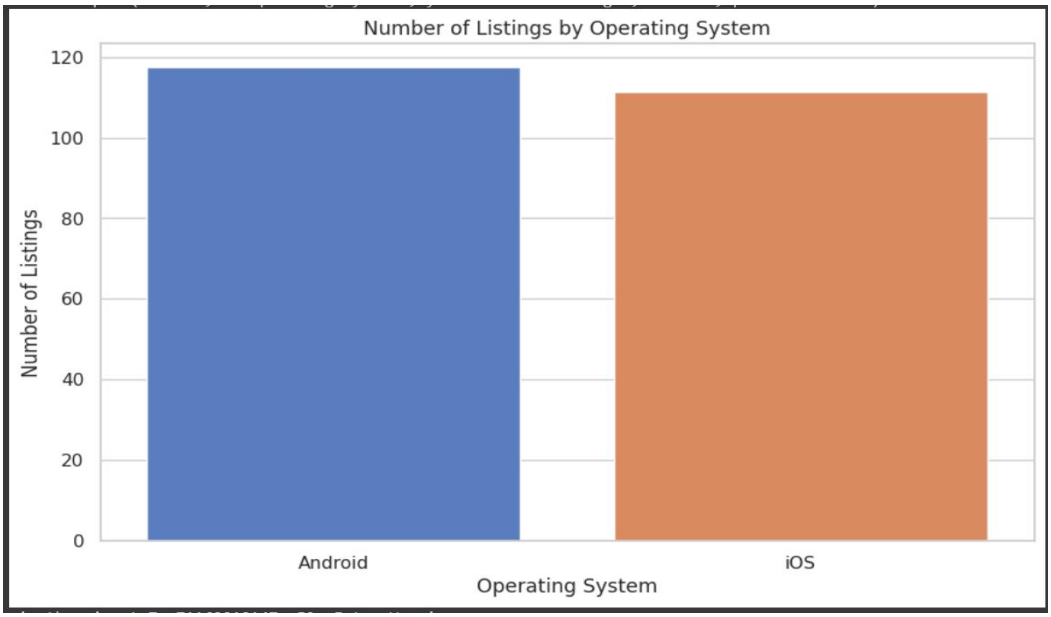
Meanwhile, as operating systems run in different regions, their interaction becomes quite important to understand consumer preferences or market strategies. This section broadens the scope of the analysis to understand how different operating systems are faring in different regions and has tried to throw light on regional adoption trends.

Visualizations

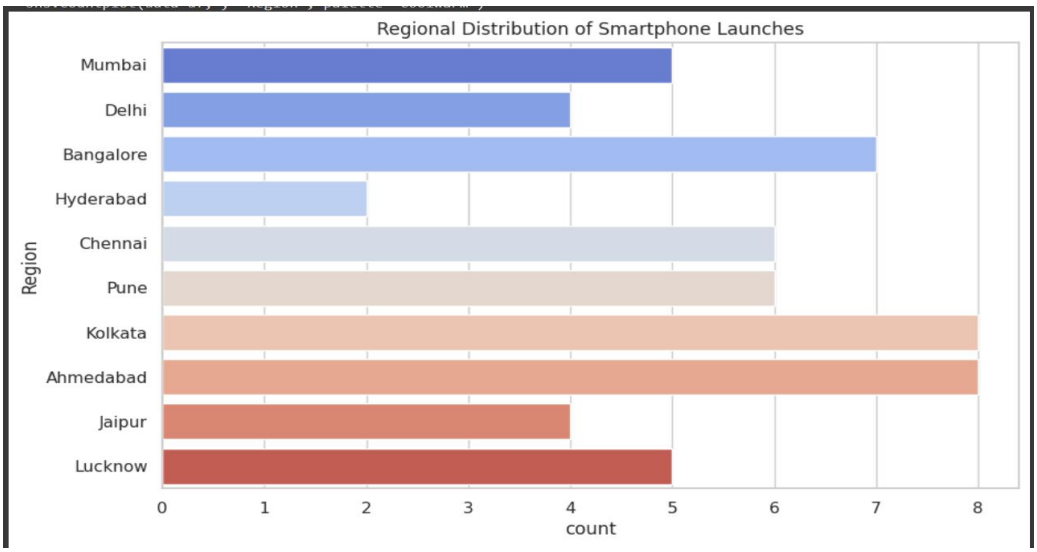
1. **Distribution of Smartphones by Brand and Price Segment** – A bar plot illustrating how different brands are positioned within various price segments.



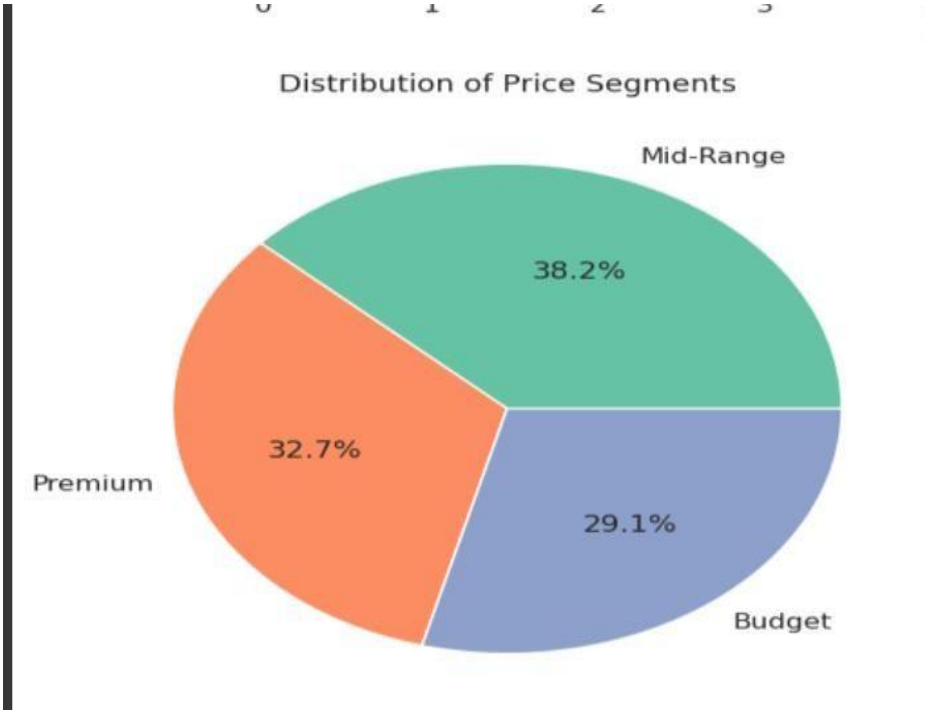
2. **Number of Listings by Operating System** – A bar plot showing the distribution of smartphone listings by operating system.



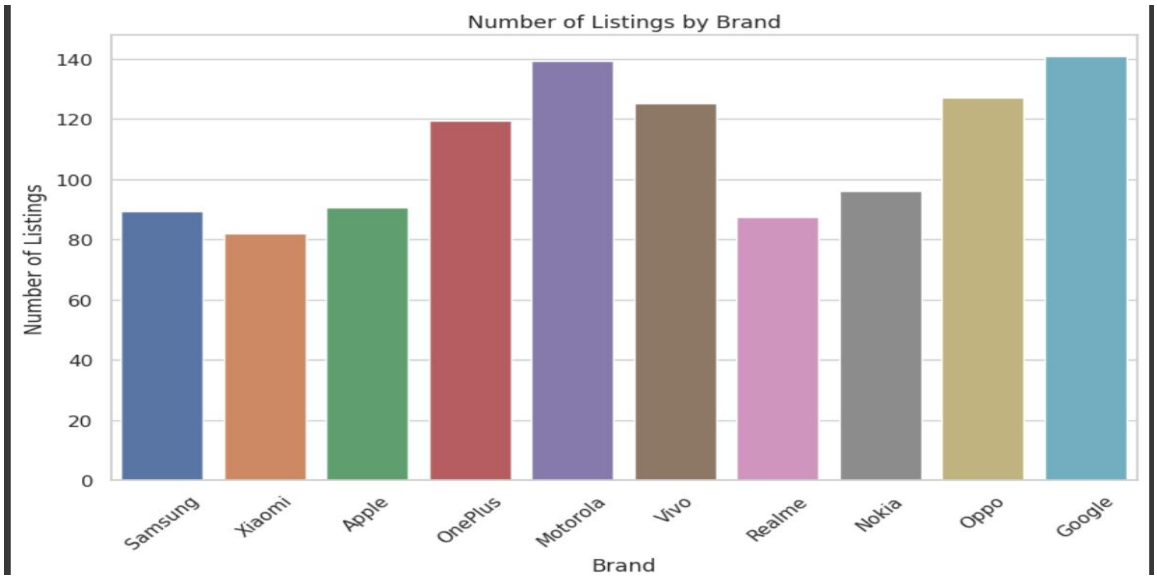
3. **Regional Distribution of Smartphone Launches** – A count plot highlighting the concentration of smartphone launches across different regions.



4. **Distribution of Price Segments** – A pie chart visualizing the overall market share of each price segment.



5.Number of Listings by Brand – A bar plot displaying the number of smartphone listings for each brand.



1. **Number of Listings by Brand** – A bar plot displaying the number of smartphone listings for each brand.

Conclusion

Looking at the launches of different segments and regions of smartphones gives valuable insights into the current state of the market. With those in mind, brands could adjust their strategy towards a certain price segment, improve their offering of operating systems, or target regions. These trends help brands to be competitive in the fast-changing consumer preferences and technologies.

Recommendations

Based on these findings, the following recommendations are proposed:

1. **Brand strate**gy: Companies should focus on diversification in terms of price segments for capturing a bigger market.
2. **Regional focus**: While launching products or devising any marketing strategy, firms need to be very region-specific, since regional preferences matter a lot.
3. **Optimization of operating system**: Brands should focus on continuous innovation and improvement in operating system features for attracting and retaining customers.

By **Adapa Ajay Kumar**

Introduction

In the digital age, online shopping has become a fundamental part of consumer behavior, offering unprecedented convenience and a vast array of choices. The smartphone sector, in particular, has witnessed explosive growth, with millions of consumers relying on e-commerce platforms to purchase their devices. Despite the abundance of options, consumers often face significant challenges in navigating the overwhelming amount of information available, leading to suboptimal purchasing decisions.

E-commerce giants like Amazon and Flipkart dominate the online marketplace, providing extensive catalogs and promising fast deliveries and quality assurance through programs like Flipkart Assured. However, these platforms are not without their flaws. Many consumers have reported dissatisfaction with products that do not meet the quality expectations set by these platforms. Brands like Maplin, iCall, and Gionee, for example, have been criticized for delivering products that fall short of advertised standards, yet they continue to be promoted.

The "Smart Search for Online Purchase" project aims to address these challenges by developing an intelligent search tool tailored specifically for smartphone purchases. This tool will prioritize accuracy, reliability, and comprehensiveness in its search results, helping consumers make informed decisions based on real-world product performance, user reviews, and ratings. By leveraging advanced data analysis and machine learning techniques, our smart search tool will bridge the gap between consumer expectations and product reality, ultimately enhancing the online shopping experience.

Problem Statement

As per the analysis of existing models, non of them meet the proper expectations of a consumer’s need and focuses of real life outcomes, because only an experienced person/firm can distinguish between specifications and real life results of any product that we use in our day to day life, even if someone tries to find a useful product without being specific, search algorithms are the main culprit to misguide the consumer, which ultimately leads to a bad purchase, and degrades the overall experience of consumer related to that product or company, just because of misleading search results.

About Dataset

The dataset used for the "Smart Search for Online Purchase" project is a comprehensive collection of smartphone-related data. It includes crucial information on various smartphone models, covering a range of features that are key to consumer decision-making. The dataset comprises fields such as brand, model, processor type, battery capacity, display size, sales price, sales figures, and ratings.

Each record in the dataset represents a specific smartphone model, providing detailed specifications and performance metrics. The dataset is particularly valuable for understanding consumer preferences, as it combines technical specifications with actual sales data and user ratings. This allows for a multi-dimensional analysis of how different factor such as processor type, battery life, and display size affect sales and consumer satisfaction.

The inclusion of sales data enables the analysis of market trends, revealing which smartphone features are most valued by consumers. Meanwhile, user ratings provide insight into the overall satisfaction with each device, offering a qualitative measure that complements the quantitative sales figures. This dataset is instrumental in developing a smart search tool that can accurately reflect consumer preferences, helping users find smartphones that best meet their needs.

Analysis

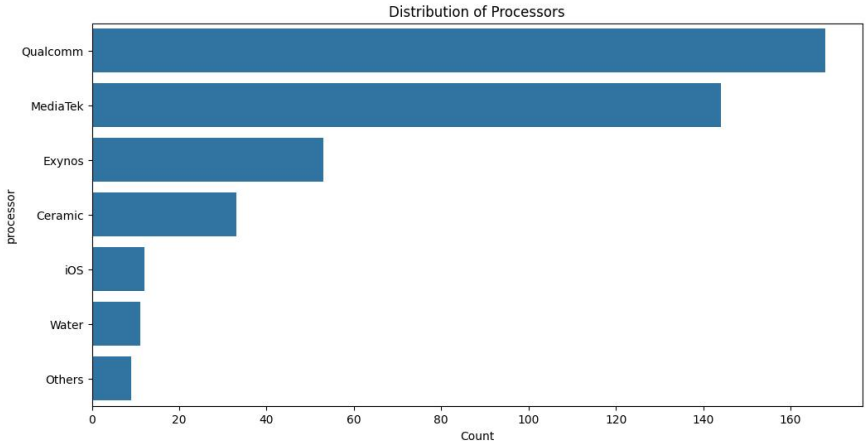
	brand	model	base_color	processor	screen_size	ROM	RAM	display_size	num_rear_camera	num_front_camera	battery_capacity	ratings	num_of_ratings	sales_price	discount_percent	sales
0	Apple	iPhone SE	Black	Water	Very Small	64	2	4.7	1	1	1800	4.5	38645	32999	0.17	127.52
1	Apple	iPhone 12 Mini	Red	Ceramic	Small	64	4	5.4	2	1	2815	4.5	244	57149	0.04	1.39
2	Apple	iPhone SE	Red	Water	Very Small	64	2	4.7	1	1	1800	4.5	38645	32999	0.17	127.52
3	Apple	iPhone XR	Others	iOS	Medium	64	3	6.1	1	1	2942	4.6	5366	42999	0.10	23.07
4	Apple	iPhone 12	Red	Ceramic	Medium	128	4	6.1	2	1	2815	4.6	745	69149	0.02	5.15
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
425	Xiaomi	Redmi 6 Pro	Black	Qualcomm	Small	32	3	5.8	2	1	4000	4.3	1870	7999	0.30	1.50
426	Xiaomi	Redmi 6 Pro	Red	Qualcomm	Small	64	4	5.8	2	1	4000	4.3	1783	9699	0.28	1.73
427	Xiaomi	Mi 11 Lite	Others	Qualcomm	Large	128	6	6.5	3	1	4250	4.2	1554	21999	0.12	3.42
428	Xiaomi	Redmi 8A Dual	Blue	Qualcomm	Medium	32	3	6.2	2	1	5000	4.2	8161	8299	0.07	6.77
429	Xiaomi	Redmi 6 Pro	Blue	Qualcomm	Small	32	3	5.8	2	1	4000	4.3	1870	8190	0.36	1.53

430 rows × 16 columns

Based on this data lets do some analysis which is useful for the report, using columns processors and sales and other.

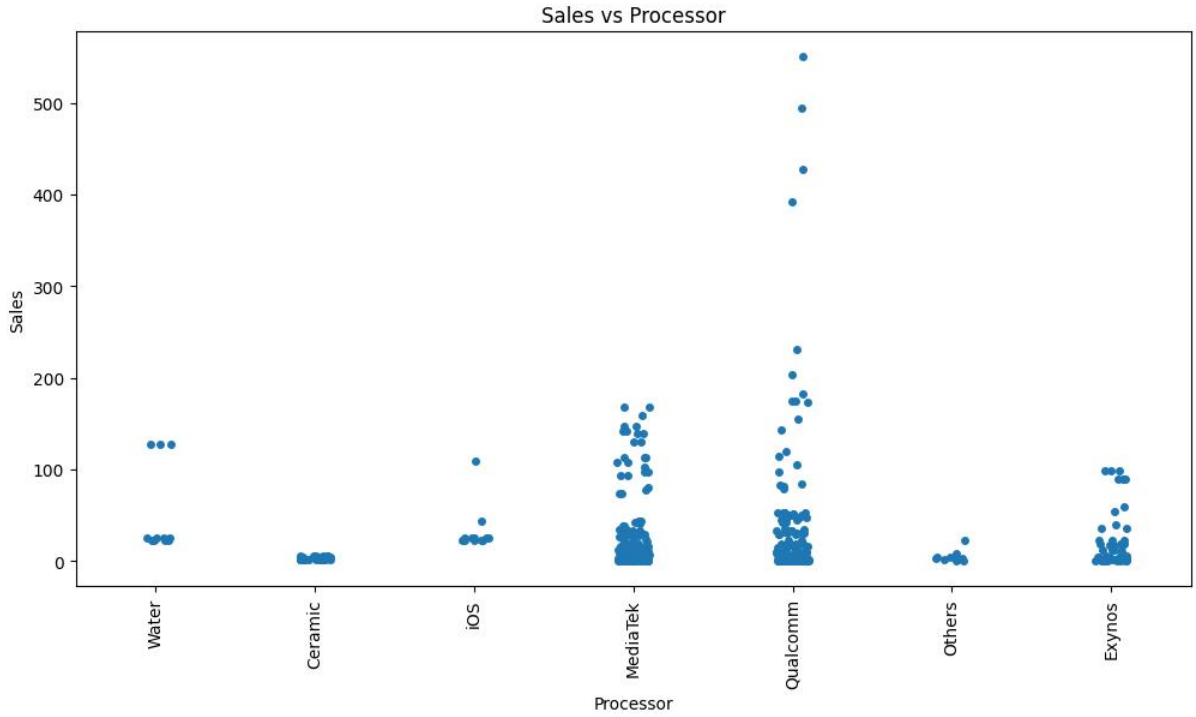
```
processor
Qualcomm    168
MediaTek    144
Exynos       53
Ceramic      33
iOS          12
Water        11
Others        9
Name: count, dtype: int64
```

Distribution Of Processors



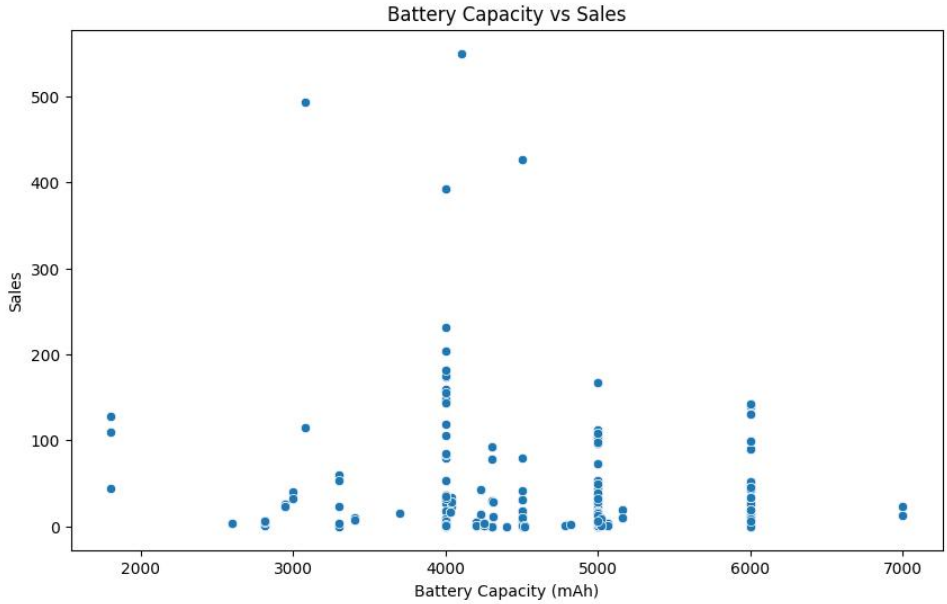
As we can see that Qualcomm Processors are leading in sales industry following by MediaTek and others.

Sales vs Processor:



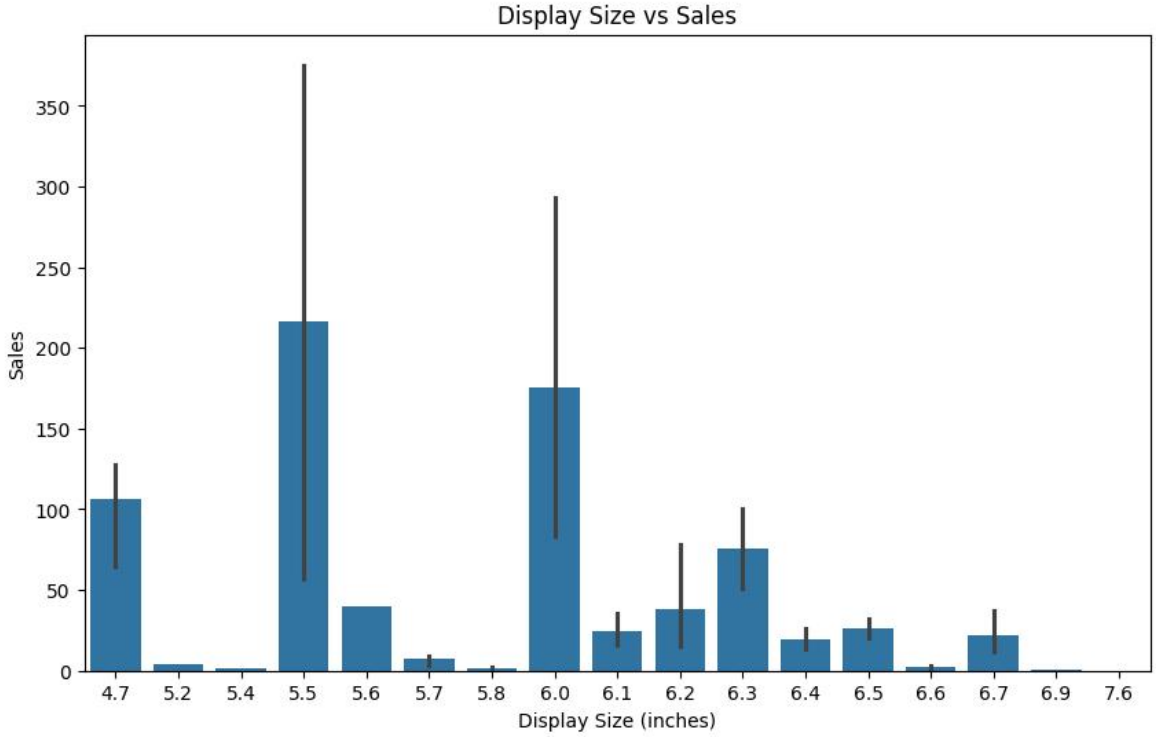
As we can say that Qualcomm are attracting customers more than any processor so we can say by marketing mobile with this processor we can expect some good business due to its nature and trust in people's mind.

Battery Capacity vs Sales:



The scatter plot between battery capacity and sales indicates that smartphones with higher battery capacities tend to have higher sales. This suggests that consumers prioritize long battery life when making purchasing decisions, especially for smartphones, which are often used heavily throughout the day.

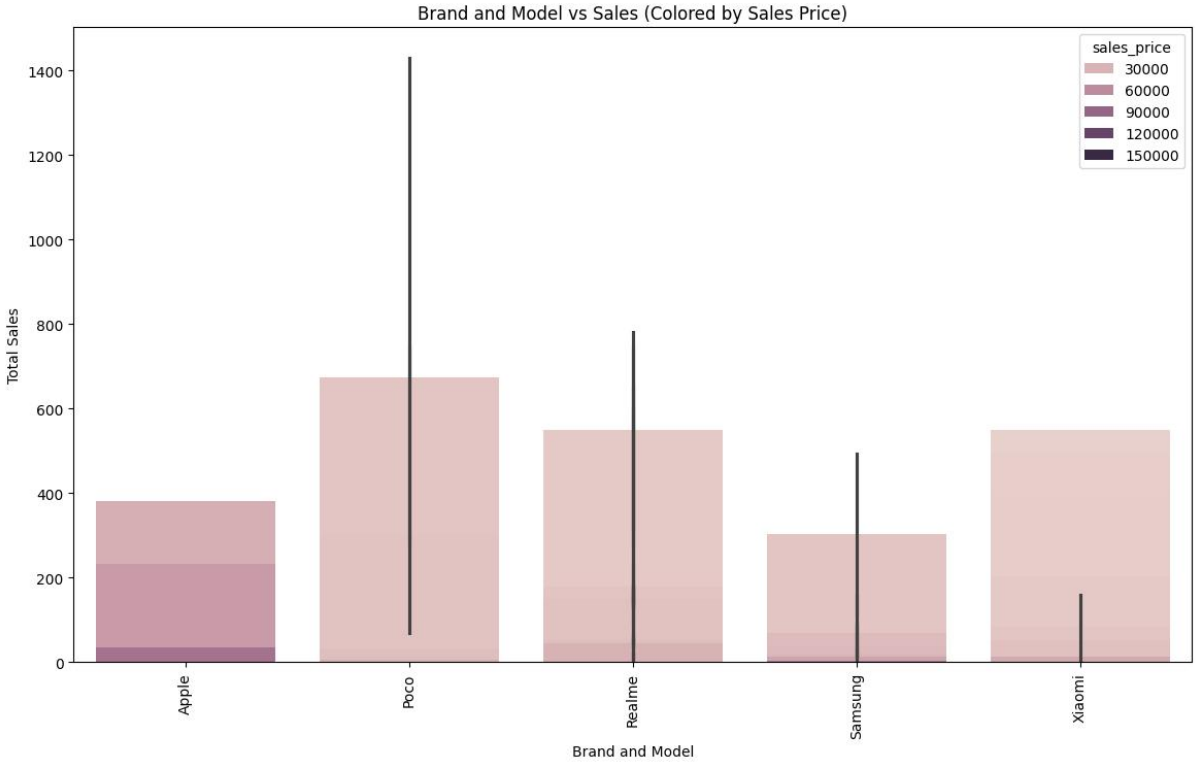
Display Size vs Sales:



The plot of display size versus sales reveals a positive correlation between larger display sizes and higher sales. This trend indicates that consumers prefer smartphones with larger screens, likely for better media consumption, gaming, and browsing experiences.

Display sizes between 5.5 inch to 6.0 inch has better sales because gamers mostly prefer larger screens.

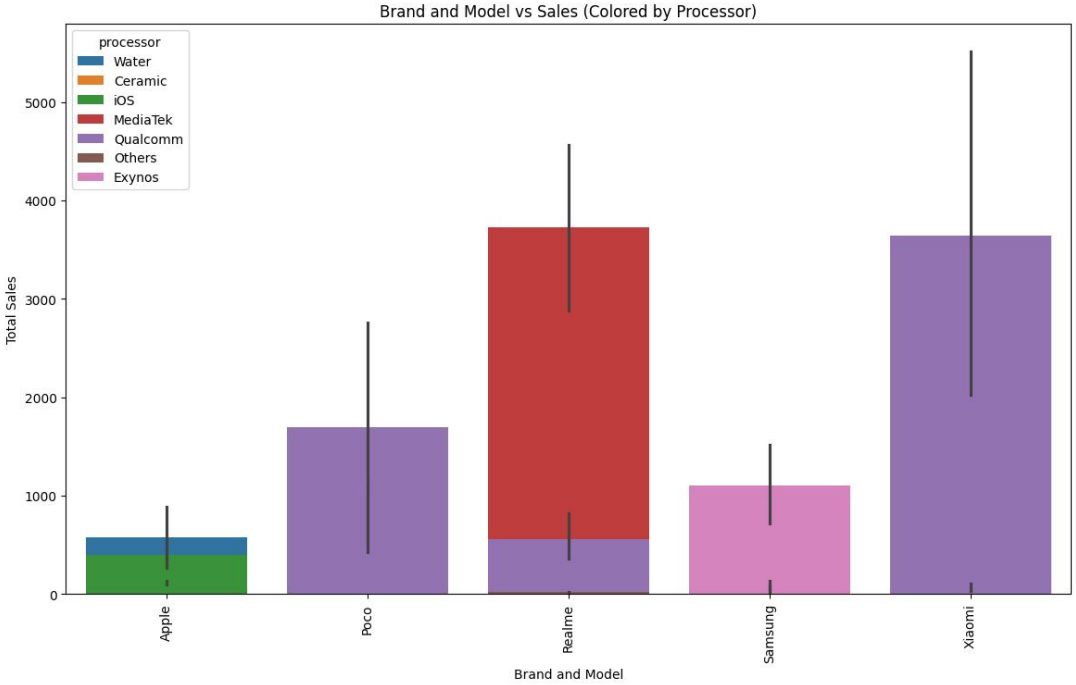
Brand, Model, Sales Price vs Sales:



The bar plot comparing brand, model, sales price, and sales shows that certain brands consistently outperform others in terms of sales. Moreover, higher sales prices do not necessarily correlate with lower sales, implying that consumers are willing to pay a premium for reputable brands and models that offer perceived quality and value.

Expect Apple all the other brands in a average they are good with sales, like Poco has more gamming features compare to them so it has a higher sales than other.

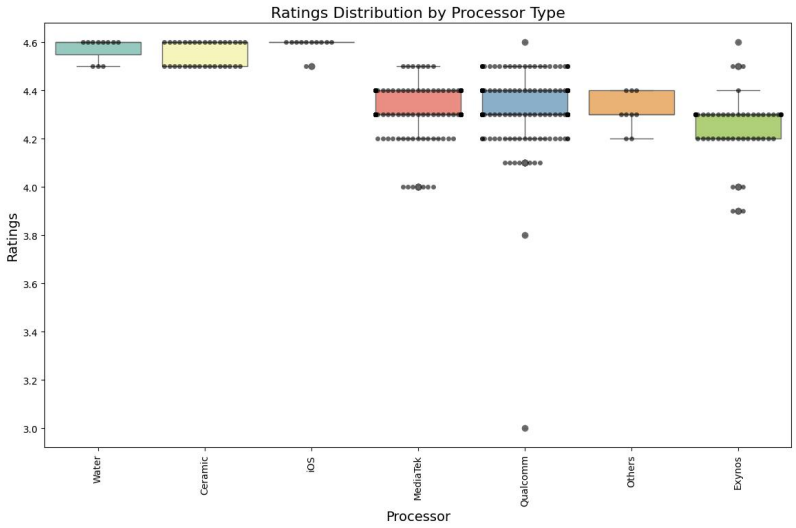
Brand, Model, Processor vs Sales:



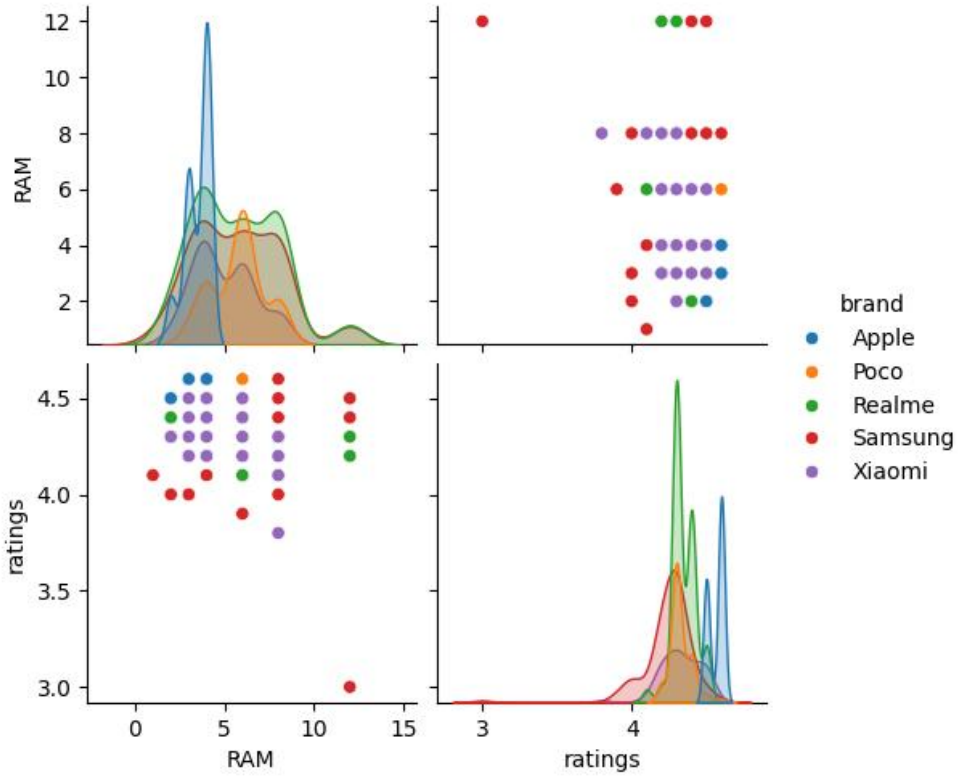
The bar plot illustrating the relationship between brand, model, processor, and sales demonstrates that certain processors are more popular among consumers, particularly when paired with specific brands. High-performance processors like Snapdragon tend to drive sales, especially in mid-to-high-end models, suggesting that processing power is a key consideration for many buyers.

Brands like POCO, RealMe and Xiaomi are frequently interested in Media Tek and Qualcomm processors and Samsung, Apple are comfortable with their own Processor.

Ratings vs Processor:

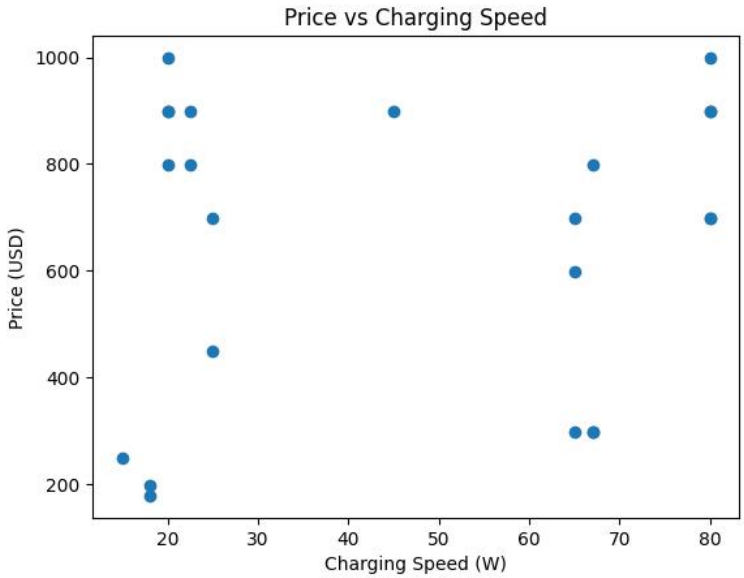


The box plot comparing ratings and processors indicates that certain processors consistently receive higher ratings from users. This pattern suggests that consumers are generally satisfied with the performance of these processors, which in turn drives positive reviews and higher ratings.



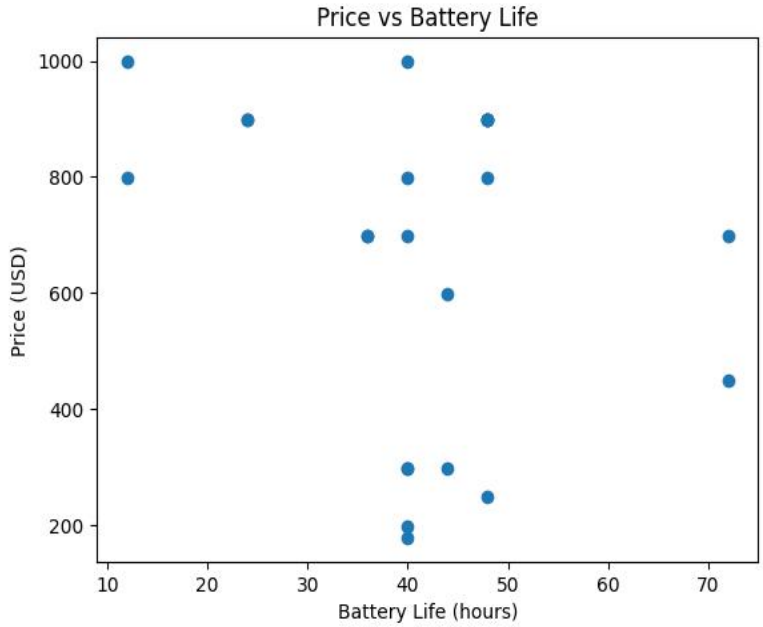
From the above two graphs we can conclude that ratings are also in favour with the two top processors media Tek and Qualcomm.

Price vs Charging Speed:



The scatter plot shows a weak positive correlation between price and charging speed. While there is a general trend of higher-priced phones having faster charging speeds, there are many exceptions. The graph highlights that charging speed is not the sole determinant of price, and other factors like brand, features, and quality also influence pricing. This insight can help consumers make informed decisions when evaluating phone prices and charging speeds.

In some common terms brands use balance the battery capacity and charging speed in terms of money. A good business strategy.



The bar chart shows significant variations in average prices across different phone brands. Premium brands like Apple and Samsung have higher average prices, while budget-friendly brands like Xiaomi and Realme have lower average prices. The graph highlights the pricing strategies of different brands, with some focusing on premium features and others prioritizing affordability. This insight can help consumers make informed decisions when choosing a phone brand that fits their budget and needs.

Conclusion

The analysis and visualizations indicate that consumers place significant importance on specific smartphone features such as battery capacity, display size, and processor type when making purchasing decisions. Brand reputation also plays a crucial role, with consumers often willing to pay more for models that come from trusted manufacturers and are equipped with high-performance components.

To improve the online shopping experience, especially for smartphone purchases, a smart search tool should prioritize these key features battery capacity, display size, and processor type while also taking into account user ratings and brand reputation. By doing so, the tool can effectively filter out lower-quality products and guide consumers toward options that best meet their needs, ensuring a more satisfactory and reliable purchase experience.

People who prefer gaming choose mostly media Tek and Qualcomm processors and screen size, so elevating them adds benefits to this site.

The smart search tool should ***integrate advanced filtering options that allow users to specify their preferences for battery life, screen size, processor performance, and brand. Additionally, it should highlight highly-rated products that have consistently received positive feedback*** from users. This approach will empower consumers to make informed decisions, leading to greater satisfaction and reducing the likelihood of regrettable purchases.

By **Krishna Mahajan**

Analysis of Smartphone Price Distribution in India

Introduction

The objective of this analysis is to understand the distribution of smartphone prices in India and identify the most popular price range. This study is essential for businesses and marketers to target their products effectively and optimize pricing strategies.

Methodology

The dataset consists of various smartphone models available in the Indian market, along with their corresponding brands and selling prices. To analyze the price distribution.

- **Price Binning** : The selling prices were divided into bins, each representing a range of INR 10,000. This was done to categorize the smartphones into different price segments.

- Counting Smartphones in Each Price Range

- Plotting the Price Distribution: A bar chart was created to visualize the number of smartphones sold in each price range.

- Identifying the Most Common Price Range: The price range with the highest number of smartphones was identified, along with the number of units sold in that range.

The price range with the most smartphones is (10000, 20000] with 1129 smartphones.

- Filtering Products in the Most Common Price Range: Smartphones within the most popular price range were filtered to understand which brands and models dominate this segment.

Results

- Price Distribution: The analysis revealed a clear distribution of smartphones across different price ranges. The bar chart visually represents the concentration of sales in each price segment.

- Most Common Price Range: The most popular price range for smartphones in India was identified as INR 10,000 - INR 20,000, with a significant number of units sold. This range represents the sweet spot for consumers, balancing affordability and feature set.

Filtered Products

In the most popular price range, the following brands and models were prominent:

- Brands: Apple, Vivo , Samsung.

- Models: X50, Z1X, X60 pro, iphone 7plus , S2, SM-B310EZDDINS

This information highlights the competitive landscape in the INR 10,000 - INR 20,000 segment, where several brands are vying for consumer attention with feature-rich offerings.

Identifies the Most Common Price Range:

- The code calculates the most frequent selling price in the dataset by using the .mode() function on the 'Selling Price' column. This value represents the price range at which most smartphones are sold

.

Filters Products Within the Most Common Price Range

- It then filters the dataset to extract all products that have this most common selling price.

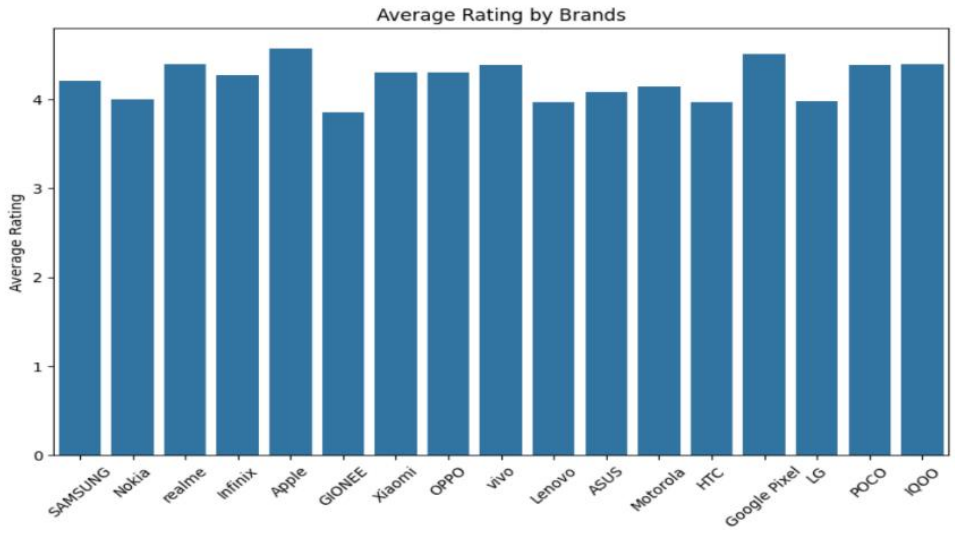
Displays the Filtered Products

The most common price range for smartphones sold is: 9999

20	Motorola	M	Grey	4 GB	64 GB	9999
176	Infinix	Hot 8	Shark Grey	4 GB	64 GB	9999
191	Lenovo	K9	Black	3 GB	32 GB	9999
302	realme	C25	Watery Grey	4 GB	64 GB	9999
359	Infinix	Hot S3	Blush Gold	3 GB	32 GB	9999
2860	Infinix	Smart 4 Plus	Violet	3 GB	32 GB	9999
2914	Infinix	Hot 7	Mocha Brown	4 GB	64 GB	9999
2990	realme	C21Y	Cross Black	4 GB	64 GB	9999
2991	Infinix	Hot S3	Bordeaux Red	3 GB	32 GB	9999
3051	Infinix	S4	Twilight Purple	3 GB	32 GB	9999

Overall, this code helps in identifying the most popular selling price for smartphones and lists all the brands that sell at this price point.

The main aim of the code is to visualize and compare the average customer ratings of smartphones across different brands. By creating a bar chart, the code helps in easily identifying which brands tend to have higher or lower average ratings, providing insights into customer satisfaction with various brands.



Based on the Graph

- **Good (High) Ratings:**

- Apple, POCO, and Google Pixel stand out with the highest average ratings, indicating strong customer satisfaction.

- **Low Ratings:**

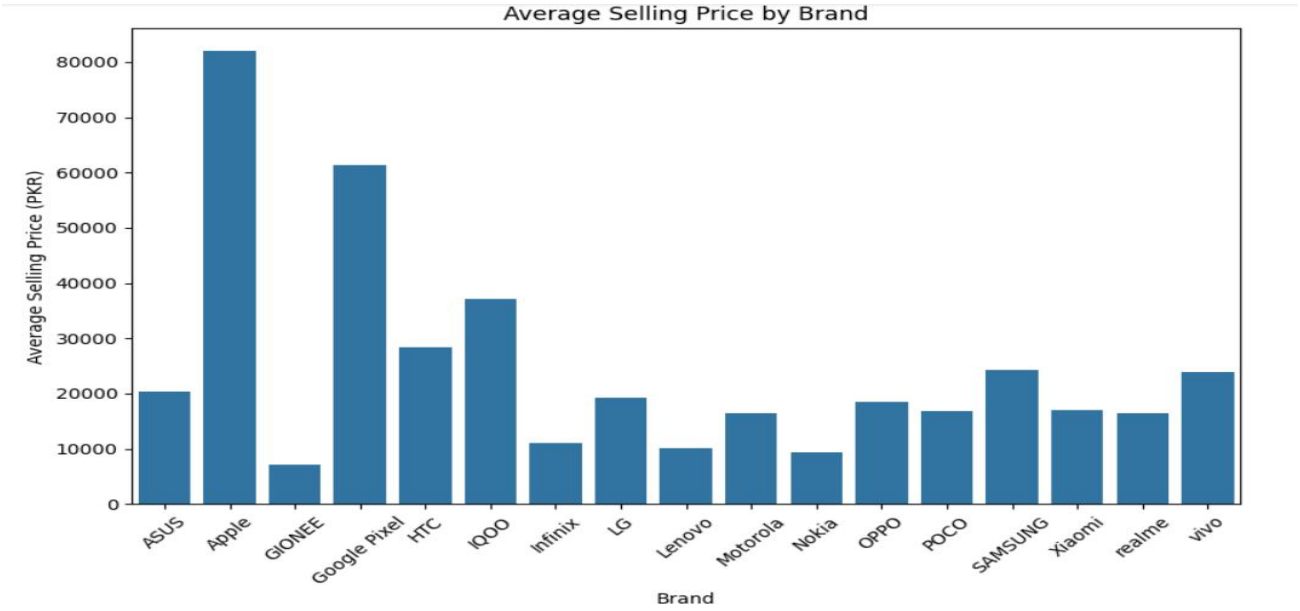
- GIONEE has the lowest average rating compared to the other brands, suggesting it may have lower customer satisfaction.

- **Summary:**

- High Ratings: Brands like Apple, POCO, and Google Pixel are likely to be perceived as offering high-quality products.

- Low Ratings: GIONEE may need to address issues to improve customer satisfaction based on its lower average rating.

Based on the Graph



High Selling Price:

- Apple: Apple has the highest average selling price, which suggests it is positioned as a premium brand.

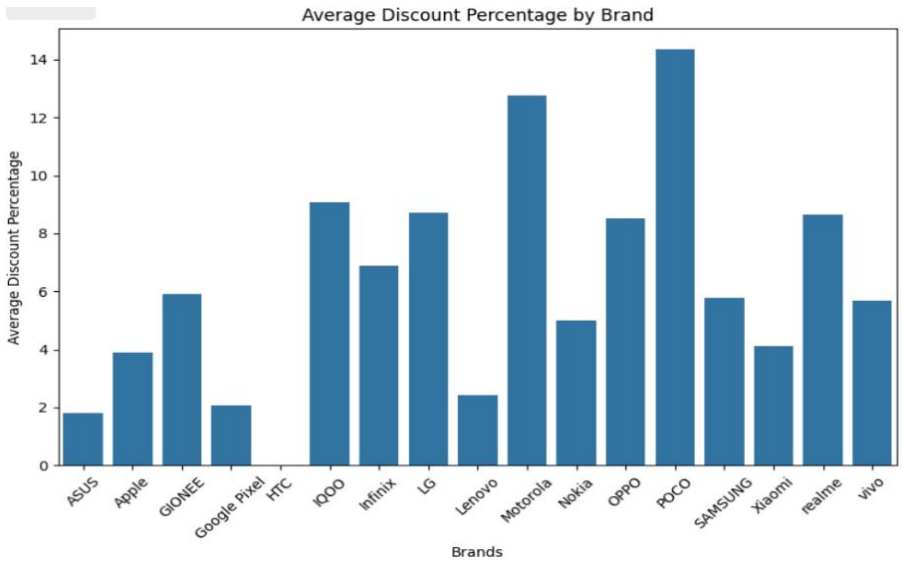
Low Selling Price:

- GIONEE: GIONEE has the lowest average selling price, making it one of the more budget-friendly options.

- Good Selling Price: If you define "good" as a premium brand with high pricing, then Apple fits this category.

- Affordable Selling Price: If "good" means more affordable, then GIONEE would be the brand with a low average selling price.

Based on the graph:



High Discount Percentage:

- POCO has the highest average discount percentage, indicating that this brand offers the most significant discounts on its products.

Low Discount Percentage:

- ASUS and Apple have the lowest average discount percentages, suggesting that they offer fewer discounts compared to other brands.

Summary

- High Discounts: POCO is the brand with the most aggressive discounting strategy.

- Low Discounts: ASUS and Apple are more conservative with their discounting, possibly indicating a focus on maintaining premium pricing.

Analysis of Top-Rated Smartphone Models

In this project, we conducted an analysis to identify the top-rated smartphone models based on user reviews. Our dataset includes ratings across various brands and models, aiming to highlight devices that consistently receive high praise from users.

Key Findings:

- Vivo emerged as a dominant brand in our analysis, with multiple models such as X50, Z1x, X60 Pro, and S2 all receiving perfect ratings of 5.0. This indicates strong consumer satisfaction with Vivo's offerings.

- Apple's iPhone 7 Plus also stood out, appearing twice in the top-rated list with a perfect 5.0 rating, showcasing its enduring popularity and reliability among users.

- Samsung's SM-B310EZDDINS model, known for its basic features, surprisingly secured a 5.0 rating as well, which highlights its appeal to a specific segment of users looking for simplicity and functionality.

Conclusion:

The analysis reveals that brands like Vivo, Apple, and Samsung continue to maintain a strong presence in the smartphone market with models that excel in user satisfaction. These insights can be valuable for stakeholders looking to understand consumer preferences and trends in the smartphone industry.

Financial Report

By Nikhil Dhankhar and Pragya Sharma

To calculate total profit, we need to subtract all the operational costs from the total of all the revenue streams.

Below is a list of all possible revenue generation sources and all the costs associated with the production.

- **Total Revenue (INR)** includes income from:
    - Paid consultancy services o Commissions from brands for listing their products o Charges for endorsing upcoming products o Promotional charges for ads and YouTube video placements o Affiliate link commissions o Data sales to brands
- **Total Costs (INR)** includes:
    - Development and maintenance of the platform o Costs associated with machine learning models, AI chatbots, and data acquisition
    - Customer support and consultancy services o Marketing and promotional expenses o Hosting and domain costs

Assumptions:

Hypothetically if our smart search platform is have a traffic of around 1 Lakh visitors per month then

REVENUE GENERATION

A) **Affliate Links** - Charges a commission of ₹100 for each successful purchase made through it. Assuming 5000 Transactions per month and 60000 per year will generate us yearly revenue of 6000000 (60Lakhs)

B) **Paid consultancy** - For each contact session we will charge 49/- and having around 50 sessions per day, 1500 sessions per month and 16000 sessions per year will generate us a yearly revenue of 800000/- (8 Lakh)

C) **Brand Endorsement and density**- As per our web traffic our CPM i.e, Cost per Thousand Impression we can charge around 500*(100000/1000) = 50000/for each product.

At this stage we are atleast having 30 new products listings every month so on yearly basis we can have 400(approx) listings of products. So the revenue generated will be 50000*400=20000000 (2 Cr)

D) **Youtubers Promotional Charges**: It is subjective and different for each youtuber as per there content but lets assume that we considered 5 youtubers to have on our platform and monthy charges for each of them will be 1 Lakh per year so yearly revenue from here will be around (5 Lakhs).

E) **Providing Data of customers to brands** : We can for sure charge a good yearly amount but didn't figured it out till now so we will assume its revenue to be a variable "X".

COST TO BUSINESS

A) **Development and Maintenance** : It will include the platform building cost, server cost, salaries of employees (10)

B) **For domain and server** we assume that our expense would be around 1 lakh per month, and 12 lakhs yearly.

C) **For Salaries** if avg is 40 Thousand then for 10 employees it will be 4 lakhs per month and around 60 lakhs per year if taking company cost for each employee(medical allowances, holidays, Extra perks).

D) **Promotions** : we will have a budget of around 2 lakhs per month for promotional stunts so yearly it will cost us 25 Lakhs.

Financial Equation:

Total Revenue=Product Unit Cost×Total Number of Sales−Cost to Produce

Yearly Calculation:

1. **Total Revenue:**

   Total Revenue (INR) = 60 Lakhs(A) + 8 Lakhs(B) + 2Cr (C) + 5 Lakhs(D) + X

   Total Revenue(INR)= 27300000(2.73 Cr) + X

2. **Total Cost:**

   Total Cost= 12 Lakhs (B) + 60Lakhs (C) + 25 Lakhs (D)

   Total Cost= 9700000 (97 Lakhs)

Summary:

- **Total Revenue:** 2.73 Cr + X
- **Total Costs:** 97 Lakhs
- **Total Profit:** 17600000 (1.76 Cr) Excluding Taxes

So, after covering these costs, our smart search platform is left with a profit of , 1.76 Cr , yearly , demonstrating its financial success and sustainability in the market

Final Conclusion

The analysis of smartphone launches across different segments and regions provides key insights into the current market landscape. These insights suggest that brands can strategically adjust their offerings to cater to specific price segments, optimize their operating systems, or target particular regions to stay competitive in a market defined by rapidly evolving consumer preferences and technological advancements.

Based on the findings, several recommendations can be made for brands:

1. **Brand Strategy**: Companies should aim to diversify their offerings across various price segments to capture a larger share of the market. By catering to different price points, brands can appeal to a broader range of consumers.

2. **Regional Focus** : It is essential for firms to tailor their product launches and marketing strategies to specific regions. Understanding and catering to regional preferences will enable companies to better meet the needs of consumers in different areas, thereby enhancing their market presence.

3.**Operating System Optimization** : Continuous innovation and improvement in operating system features are crucial for attracting and retaining customers. Brands should focus on enhancing these features to stay ahead in the competitive market.

When it comes to consumer behavior, the analysis indicates that specific smartphone features—such as battery capacity, display size, and processor type—play a significant role in purchasing decisions. Brand reputation is also a critical factor, with consumers often willing to pay a premium for models from trusted manufacturers that offer high-performance components.

To enhance the online shopping experience, particularly for smartphone purchases, a smart search tool should prioritize these key features: battery capacity, display size, processor performance, and brand reputation. Incorporating advanced filtering options that allow users to specify their preferences for these features will empower consumers to make more informed decisions, leading to greater satisfaction and a reduced likelihood of regrettable purchases.

Furthermore, it has been observed that consumers who prefer gaming tend to favor smartphones equipped with MediaTek and Qualcomm processors and larger screen sizes. By emphasizing these aspects, brands can attract the gaming segment of the market, offering them enhanced experiences.

In conclusion, brands like Vivo, Apple, and Samsung have maintained a strong presence in the smartphone market, particularly through models that excel in user satisfaction. These insights are invaluable for stakeholders looking to understand consumer preferences and trends, enabling them to make more informed strategic decisions in the dynamic smartphone industry.