

Sales Data Analysis

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About Data Used for Analysis

Retail Sales and Customer Demographics
Dataset

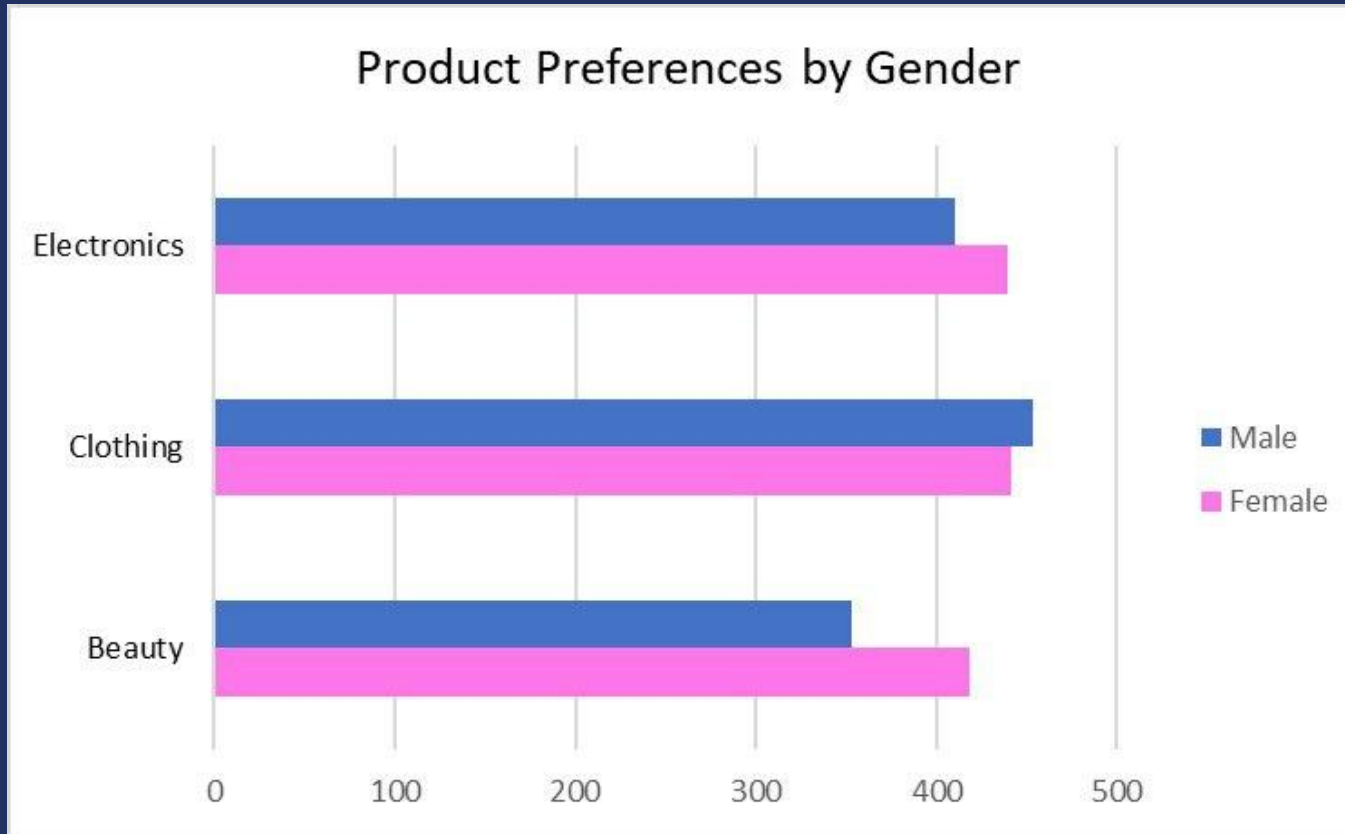
Main Objective of the Analysis

Understanding the fluctuations in client's sales
performance

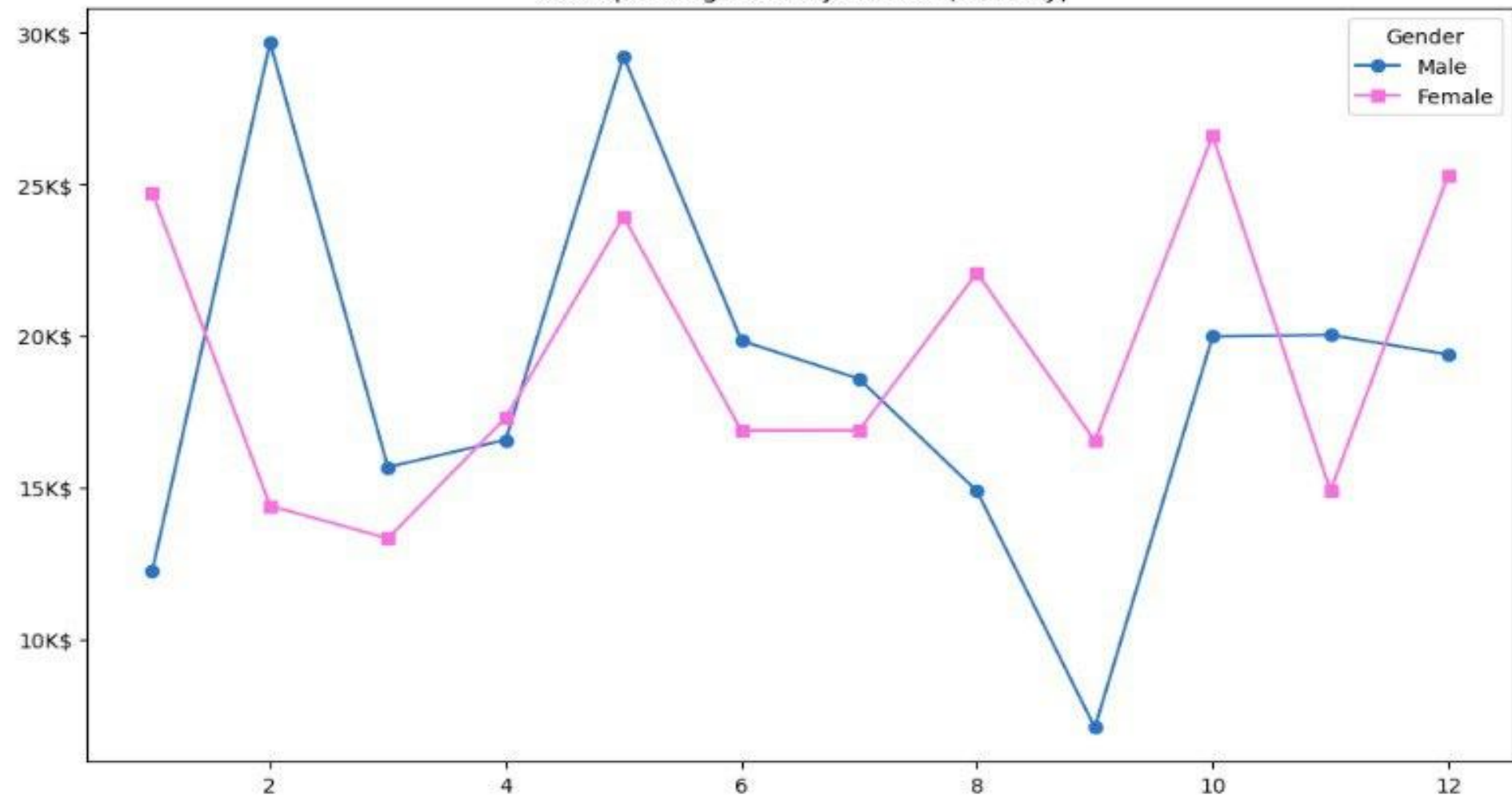
Questions Answered in the Analysis

- How does customer age and gender influence their purchasing behavior?
- Are there noticeable patterns in sales across different time periods?
- Which product categories hold the highest appeal among customers?
- What are the relationships between age, spending, and product preferences?
- How do customers adapt their shopping habits during seasonal trends?
- Are there distinct purchasing behaviors based on the number of items bought per transaction?
- What insights can be gleaned from the distribution of product prices within each category?

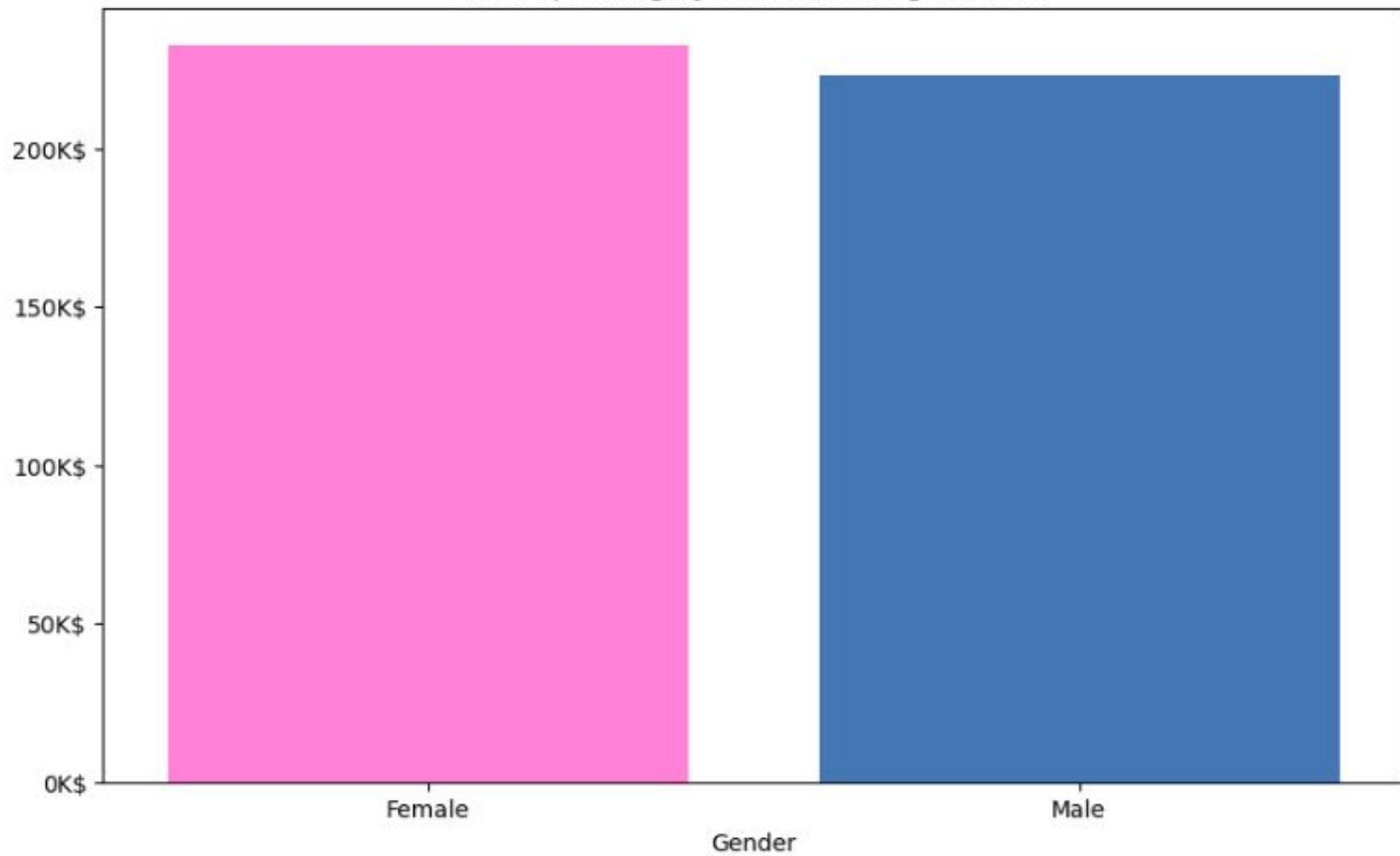
How does customer age and gender influence their purchasing behavior?



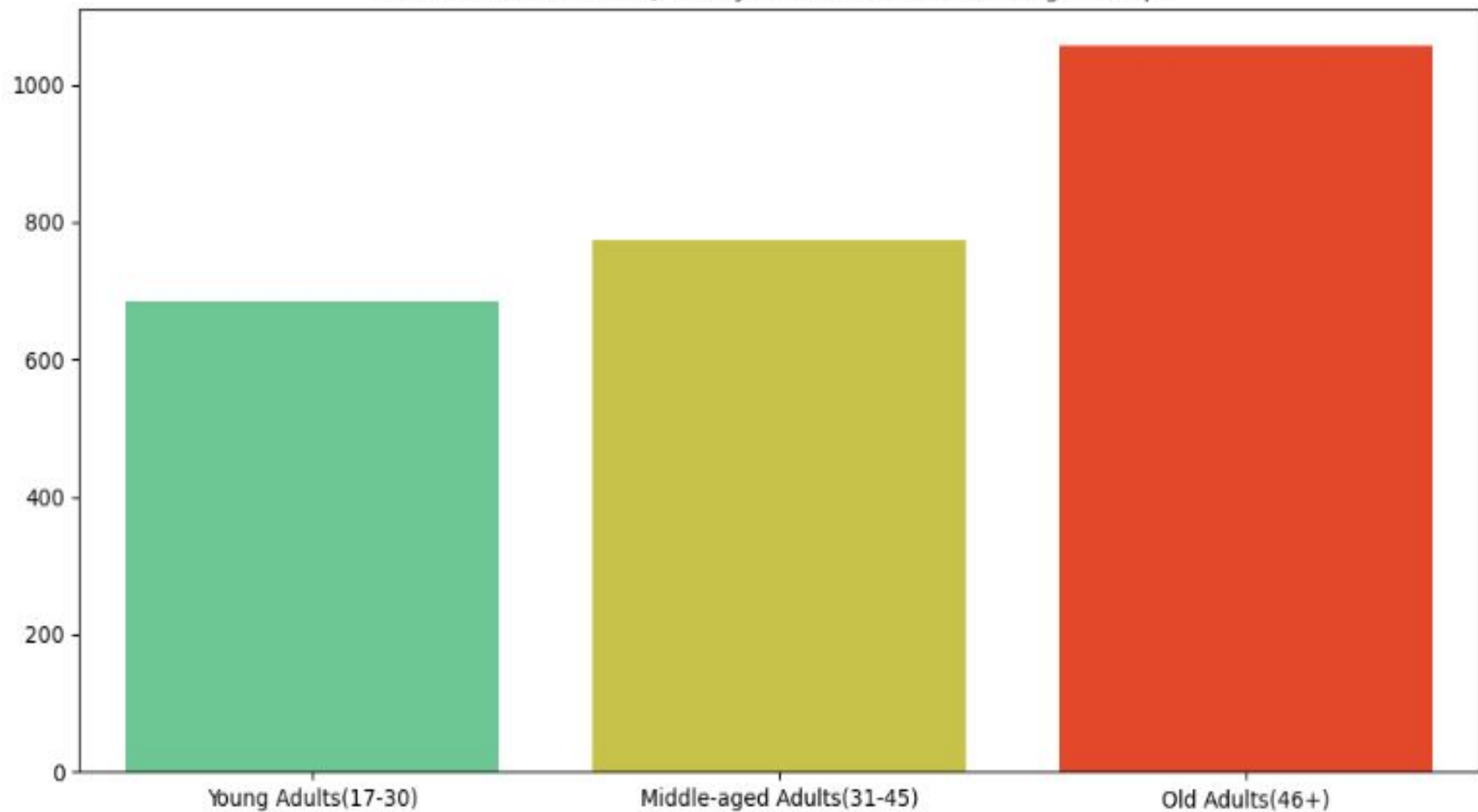
Total Spending Trend by Gender (Monthly)



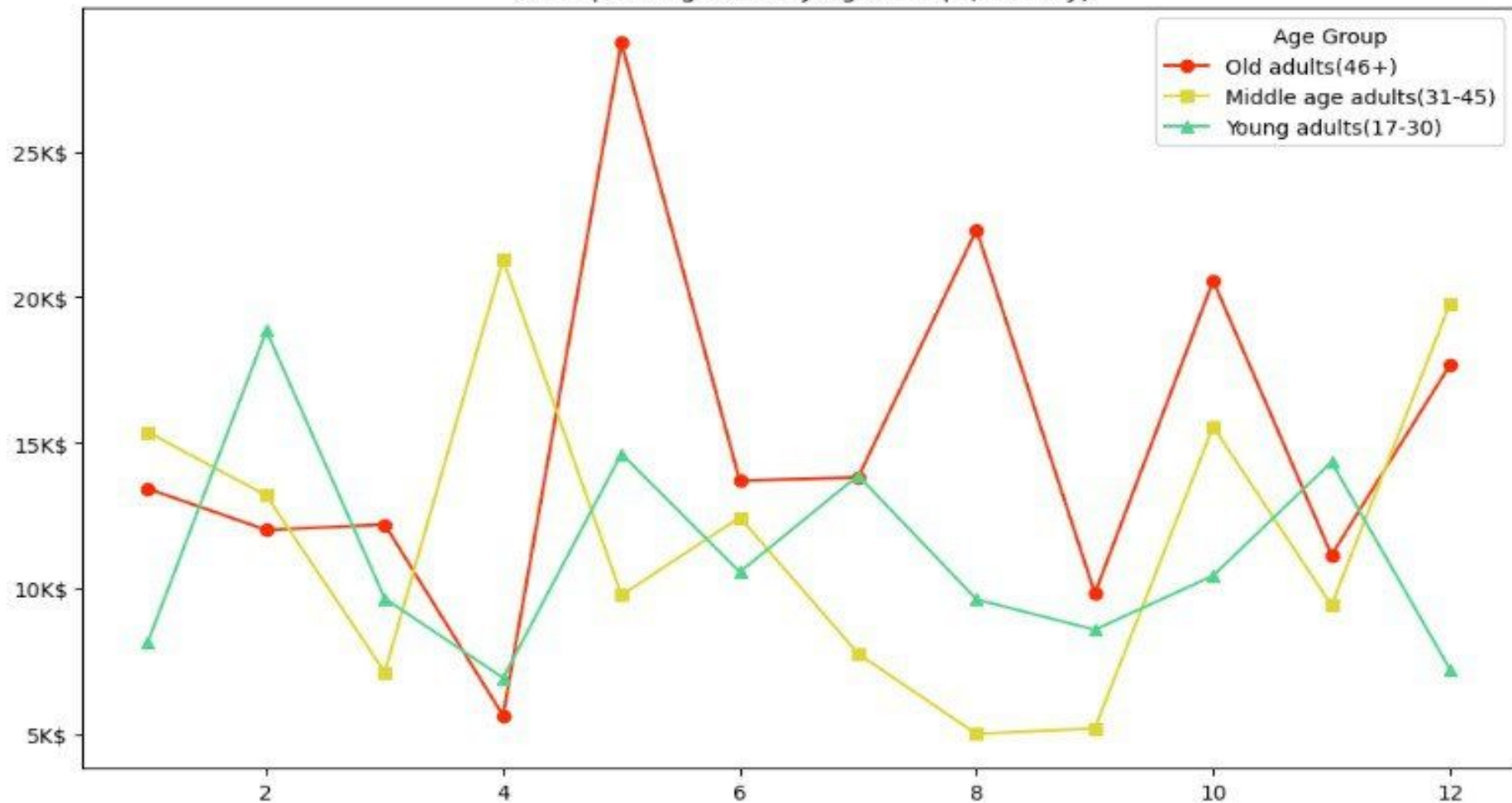
Total Spending by Gender During the Year



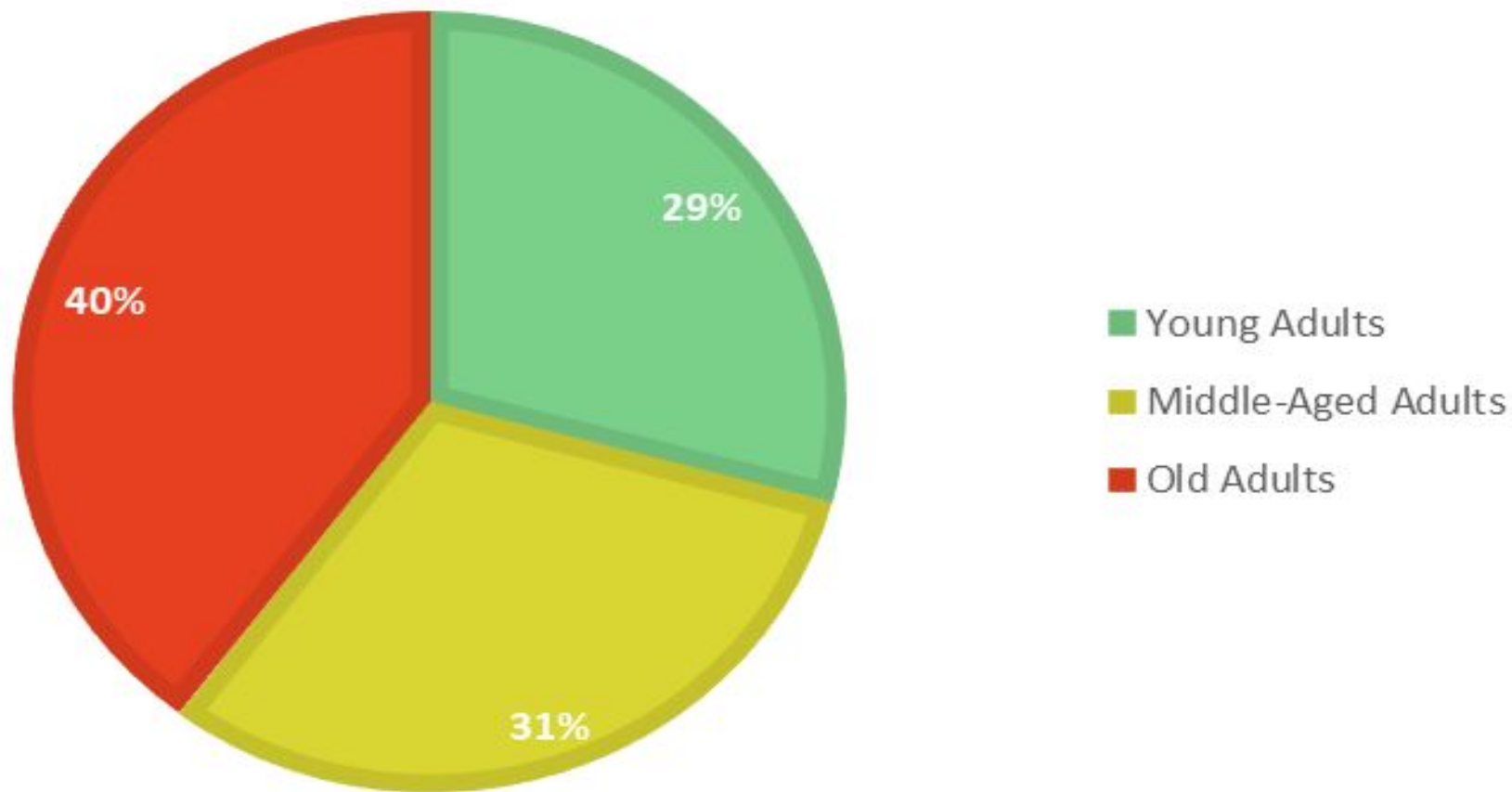
Distribution of Total Quantity Sold Across Different Age Groups



Total Spending Trend by Age Group (Monthly)



Total Sales Distribution by Age Group



The Analysis of the First Question

- According to our analysis, there is no significant difference in the preference for specific product categories between genders, as proven by conducting a t-test. However, individual preferences and shopping habits can still vary greatly.
- While there are slight ups and downs in the monthly spending for male customers, women show a more stable spending pattern. However, the total spending of both groups over the year indicates no significant difference between the two.
- Overall analysis of the year shows that the Old Adults age group makes the most purchases during the year.
- The spending was calculated on a cumulative basis over several months, which indicates that Old Adults usually tend to spend more, while Middle-Aged Adults and Young Adults exhibit nearly identical monthly spending patterns. The same pattern is visible in total sales calculations: 40% of sales comes from Old Adults, while the remaining two groups each contribute nearly the same share.

Suggestion Regarding the First Question

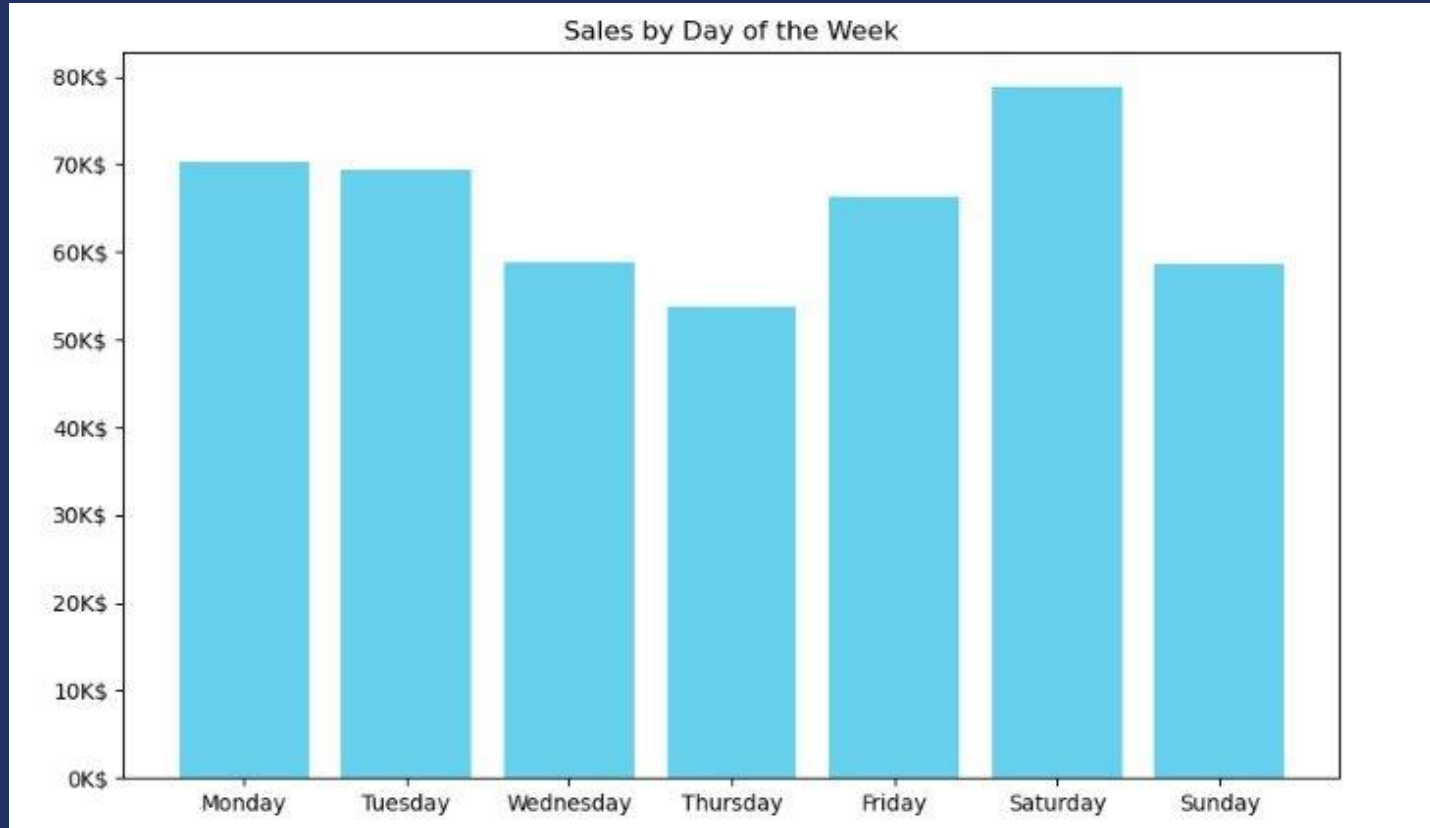
Gender

- Develop marketing campaigns that appeal to both genders, reducing the need for separate strategies.
- Stock and promote products that are universally popular among both genders.
- Design promotions and discounts that are gender-neutral and cater to the shared preferences.
- Train customer service teams to address the needs and preferences of all customers, without gender-specific biases. Positive shopping experiences can foster customer loyalty and encourage repeat purchases.
- Use customer data to personalize recommendations and offers based on individual preferences rather than gender.
- Suggest related products that align with the common preferences of both genders.

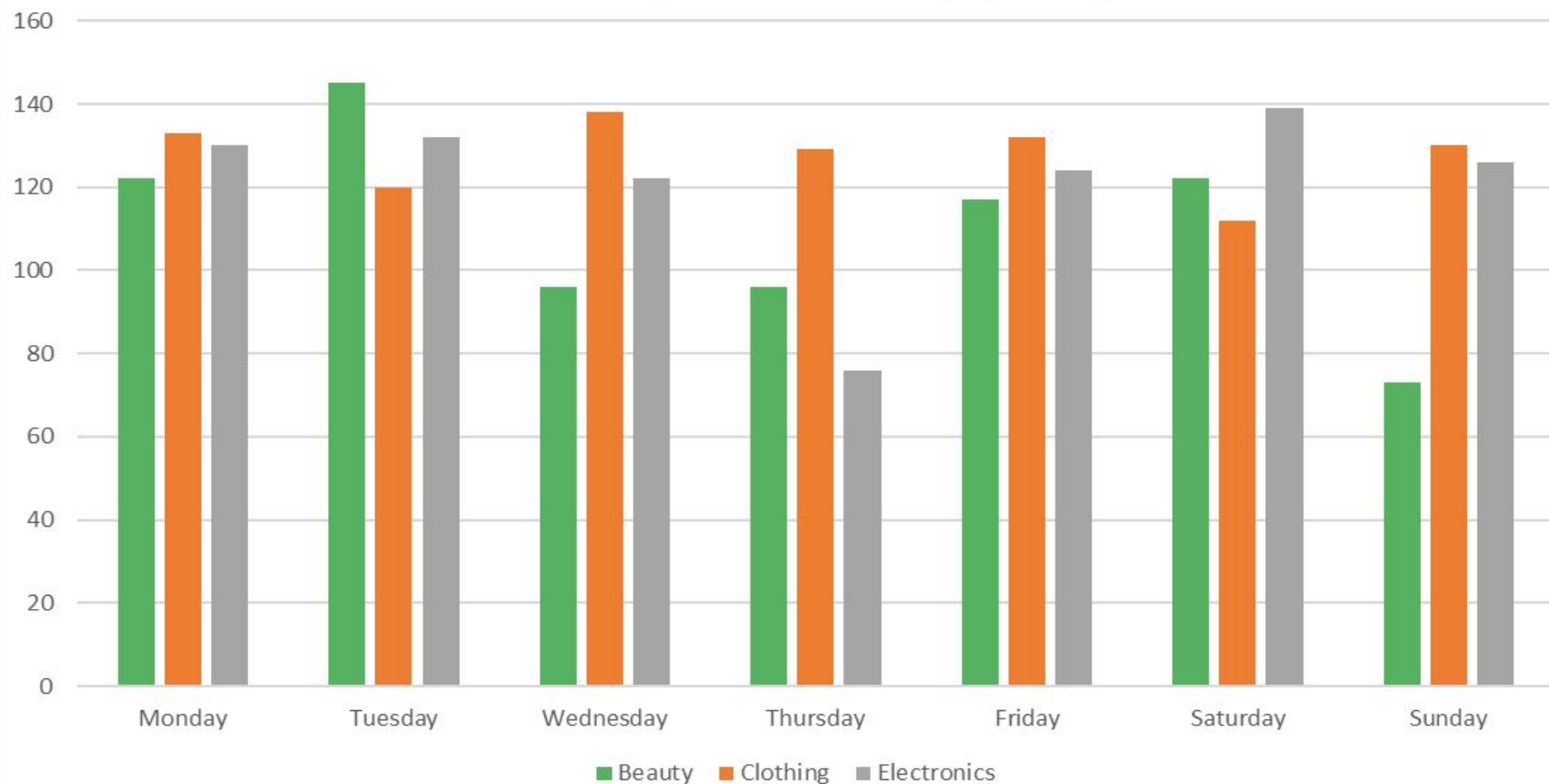
Age

- Ensure that marketing efforts, product offerings, and store experiences are inclusive and accessible to customers of all ages.
- Develop targeted marketing campaigns tailored to each age group's preferences and interests.
- As Old Adults buy and spend the most, it is recommended to promote higher-end and premium products to Old Adults, as they are the highest spenders.
- Provide services that cater specifically to Old Adults, such as easy returns, personalized shopping assistance, and extended warranties.
- Ensure that the products preferred by Old Adults are well-stocked to meet demand. However, it is also important to maintain a diverse inventory that also includes items appealing to Young and Middle-Aged Adults to attract a broader customer base.
- Also, it is strongly recommended to create incentive programs to encourage more frequent purchases from Young and Middle-Aged Adults.
- Use social media and email marketing to engage these groups with content and offers that resonate with their interests.
- Offer bundled products or bulk discounts to make purchases more attractive to these age groups.

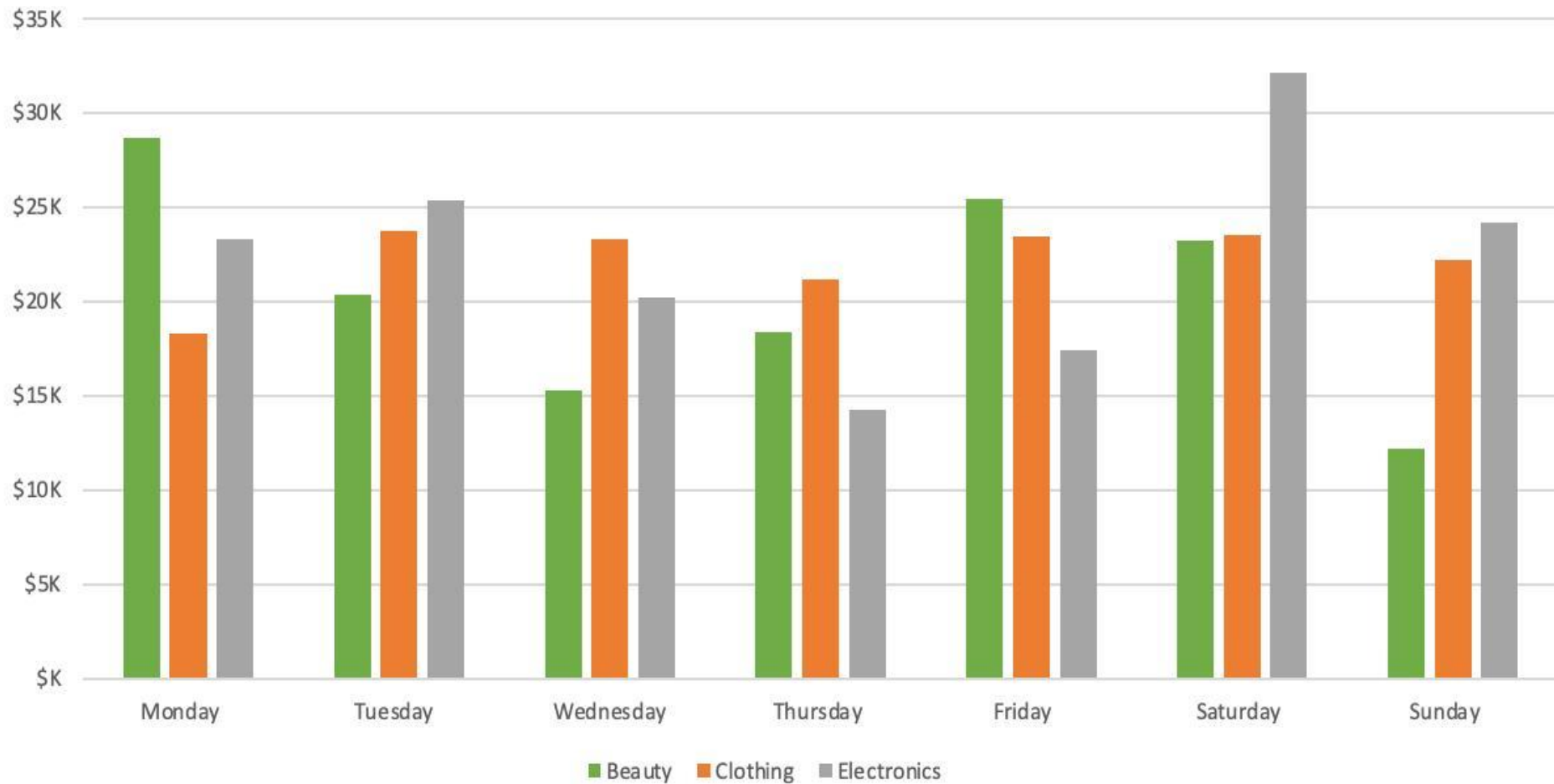
Are there noticeable patterns in sales across different time periods?



Weekly Product Sales by Quantity



Money Spent on Each Product During the Weekdays



The Analysis of the Second Question

- The yearly analysis showed that Saturday generates the highest pre-tax sales of the week. Many people have more free time on weekends, especially Saturdays, making it convenient for them to engage in leisure activities such as shopping.
- A huge factor for this can also be the individuals who receive their paychecks on a weekly or bi-weekly basis. For this individuals Saturday often coincides with payday or the day after payday. This influx of disposable income can lead to increased spending on shopping and other leisure activities.
- In some cultures or regions, Saturday may be traditionally associated with shopping or leisure activities. Cultural practices, religious observances, and community events can influence consumer behavior and contribute to higher transaction volumes on Saturdays.
- However, there are differences throughout the week in terms of quantity and spending on particular product categories. For example, Tuesday sees the highest quantity of beauty products sold, whereas Monday is when customers spend the most on beauty products. This pattern is observed across other product categories as well.

Suggestion Regarding the Second Question

Saturday

- Schedule promotions, sales, or special events on Saturdays to capitalize on increased product traffic and consumer activity. This can include weekend-only discounts, limited-time offers, or exclusive deals designed to drive sales on the busiest shopping day of the week.
- Families and friends may choose Saturdays for group outings or social gatherings, which often include shopping excursions. It is important to capitalize on this by offering promotions or special events on Saturdays to attract customers seeking weekend entertainment options.
- Allocate sufficient staffing and resources to accommodate the increased foot traffic and transaction volume on Saturdays. Ensure that stores are adequately staffed, shelves are well-stocked, and checkout lines are efficiently managed to provide a positive shopping experience for customers.
- Consider extending store hours on Saturdays or offering flexible shopping options such as curbside pickup or online ordering with in-store pickup to accommodate the needs and preferences of busy weekend shoppers. Providing convenient and flexible shopping experiences can attract more customers and drive sales.

Other days of the week

Identify Peak Days:

Analyze sales data to identify the day with the highest quantity sold and the day with the highest spending for each product category.

Design Targeted Promotions:

High Quantity Day: Offer volume-based promotions to capitalize on the high sales volume. Examples include:

"Buy One, Get One Free" deals.

Bulk purchase discounts (e.g., "Buy 5, get 20% off").

High Spending Day: Encourage higher spending per transaction with value-based promotions. Examples include:

Spend thresholds with discounts (e.g., "Spend \$150, get \$30 off").

Percentage discounts for large purchases (e.g., "Spend \$300, get 15% off").

Promotional Bundles:

Create product bundles that combine popular items with complementary products at a discounted rate. This not only increases the perceived value but also boosts sales of multiple products.

Marketing and Communication:

Use targeted marketing campaigns to inform customers about these special offers. Utilize email marketing, social media ads, and in-store signage to promote the deals.

Highlight the specific days of the week when these promotions are available to create a sense of urgency.

Implementation Example for Both Suggestions

Saturday

Promotion Details:

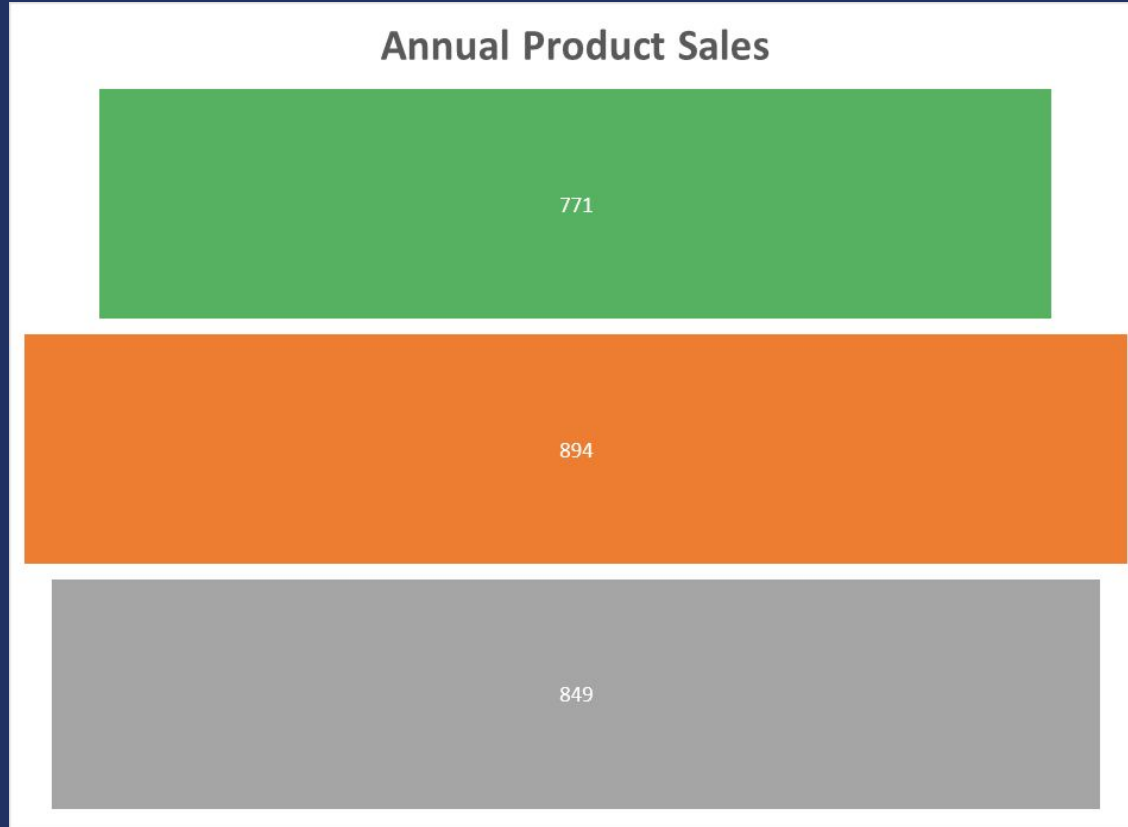
- **Discounts:** 10% off storewide (in-store and online).
- **Special Deals:**
 - Beauty Products: CHANEL 50% off.
 - Electronics: Save \$50 on \$300+ purchases.
 - Clothing: Buy 2, get 1 free.
- **Flash Sales:** Up to 50% off select items every hour.
- **Loyalty Bonuses:** Double reward points on all purchases.
- **Bundles:** Exclusive Saturday-only product bundles with 30% savings.
- **Free Gifts:** Free gift with purchases over \$100.

Other days of the week

Beauty Products:

- **Tuesday:**
 - **Promotion:** "Buy 3, Get 2 Free on all beauty products" or "Special beauty bundles at 20% off."
 - **Objective:** Increase the volume of beauty products sold.
- **Monday:**
 - **Promotion:** "Spend \$100 on beauty products, get \$20 off" or "Spend \$200, get 10% off."
 - **Objective:** Increase the average transaction value.

Which product categories hold the highest appeal among customers?



- Beauty
- Clothing
- Electronics

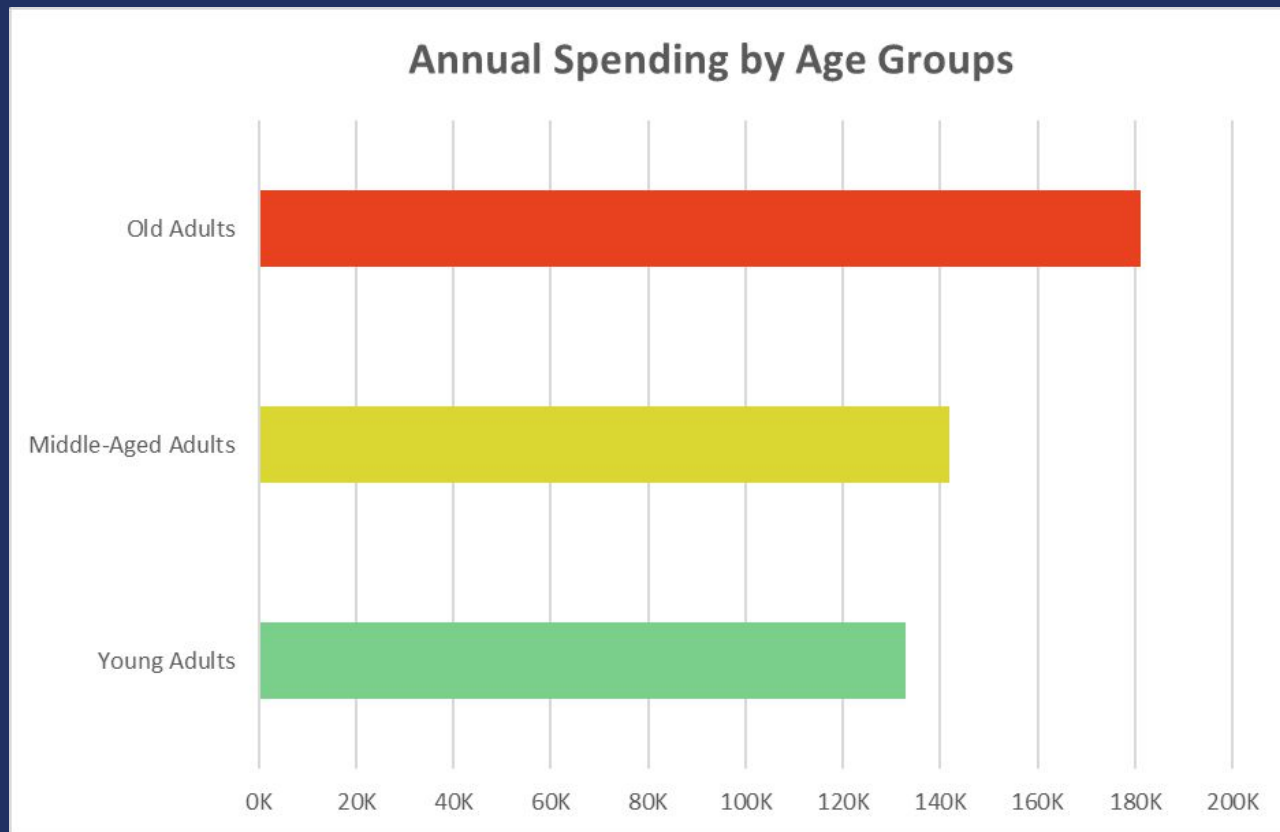
The Analysis of the Third Question

Annual product sales show no significant difference in the number of items sold across different product segments. This indicates that customers have almost similar levels of interest in various product categories.

Suggestion Regarding the Third Question

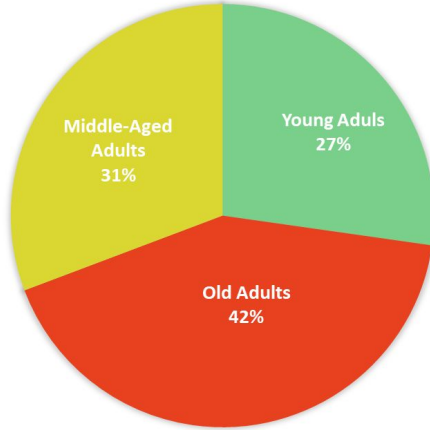
- Maintain balanced inventory levels across all product categories to meet consistent customer demand.
- Allocate marketing resources evenly across product categories to capitalize on similar customer interest.
- Arrange products in the store in a way that encourages browsing across all categories, making it easy for customers to find what they need and discover new items.
- Ensure that the quality of products and customer service is consistent across all categories to build trust and satisfaction.
- Create seasonal promotions that feature products from all categories, leveraging holidays and special events to boost sales.
- Regularly analyze sales data to identify patterns and make informed decisions about inventory, marketing, and promotions.

What are the relationships between age, spending, and product preferences?

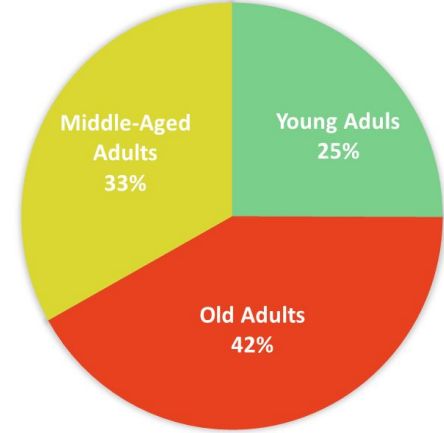


Product Preferences by Age Group

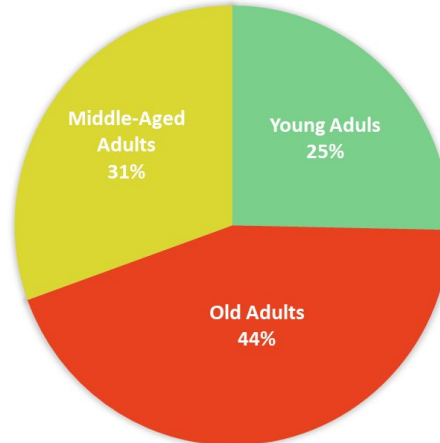
BEAUTY



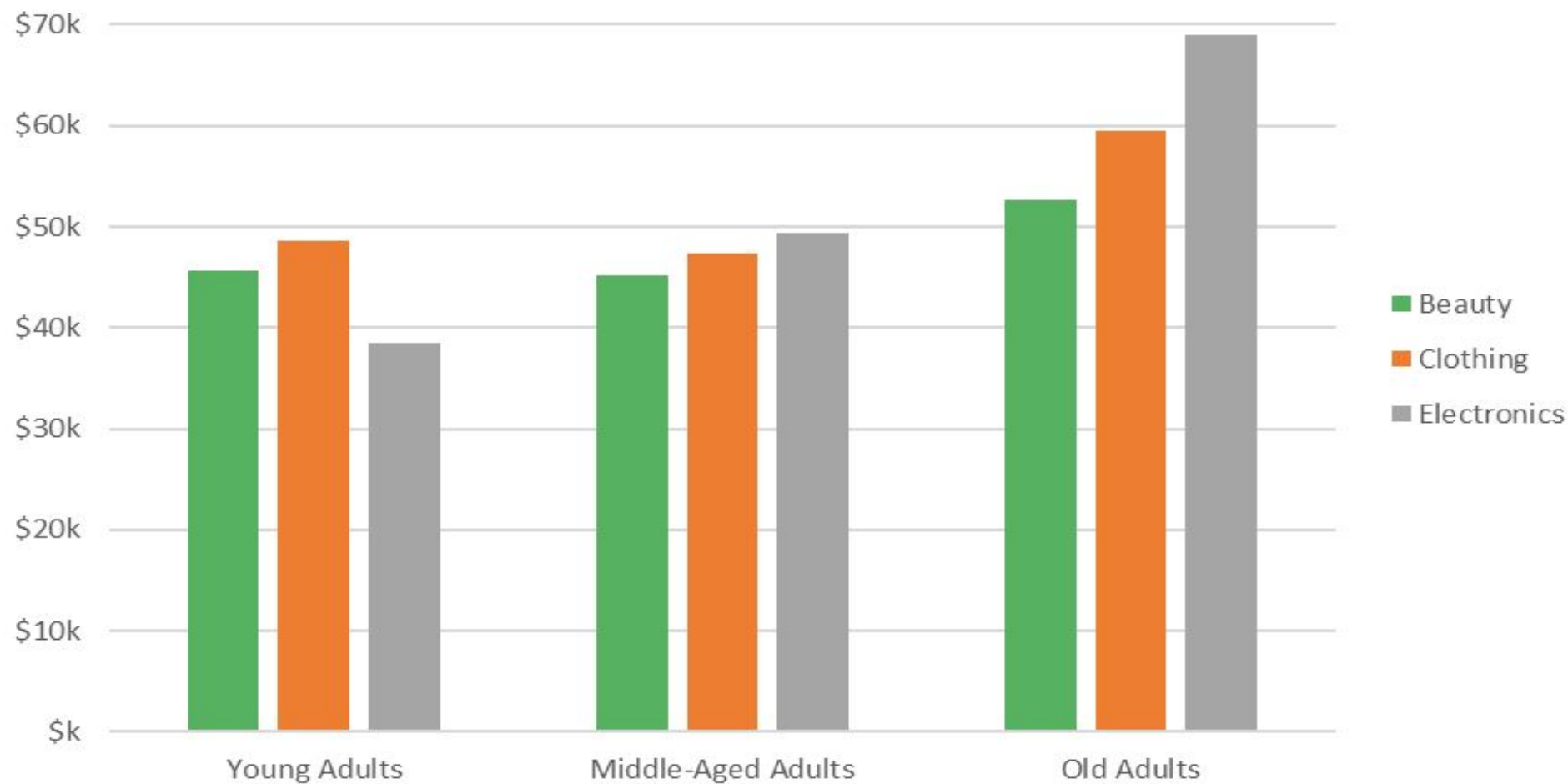
CLOTHING



ELECTRONICS



Money Spend by Each Age Group on Different Product Category During the Year



The Analysis of the Fourth Question

- According to the annual sales analysis, it is evident that Old Adults represent the highest-spending demographic throughout the year.
- Product preference analysis shows that Old Adults are also the age group that exhibits the highest interest across product categories represented in the store.
- Additionally, Old Adults spend the most on different categories of products per year.
- Middle-Aged Adults and Young Adults exhibit almost identical spending trends throughout the year, as well as across several product categories. Additionally, they demonstrate nearly identical preferences across different product segments.
- In separate product categories, Old Adults exhibit the highest interest and spend the most on Electronic products.
- While Middle-Aged Adults show the highest interest in clothing products, they spend the most on electronics. However, the spending and interest among product categories are the most balanced for this age group.
- Young Adults show the highest interest in Beauty products, however, they spend the most on clothing.

Suggestion Regarding the Fourth Question

Young Adults

- Young adults prioritize fashion and trends, as shown in the analysis. The shop needs to emphasize latest fashion trends and affordable pricing.
- They also show high interest in personal care and grooming. Ensure that the products in the shop represent the latest trades in the market, also use platforms like Instagram and TikTok for product tutorials.
- Among all of the age groups Young Adults show less interest in electronic. Possible reasons can be the shortage of budget. To solve this issue the shop needs to highlight budget-friendly gadgets and student discounts. Focus on tech that complements an active, social lifestyle.

Middle-Aged Adults

- Middle-Aged Adults show the most balanced purchasing behavior among several product categories.
- To ensure the continuity of this trend and its increase, we need to equally promote all product categories represented in the shop.
- For clothing we need to highlight quality, comfort, and value and promote versatile clothing suitable for work and leisure.
- For beauty products the shop needs to focus on anti-aging products and wellness and use content marketing to provide value through tips and advice.
- For electronics it is highly suggested to highlight practical gadgets for home and productivity, and showcase products that enhance work-life balance.

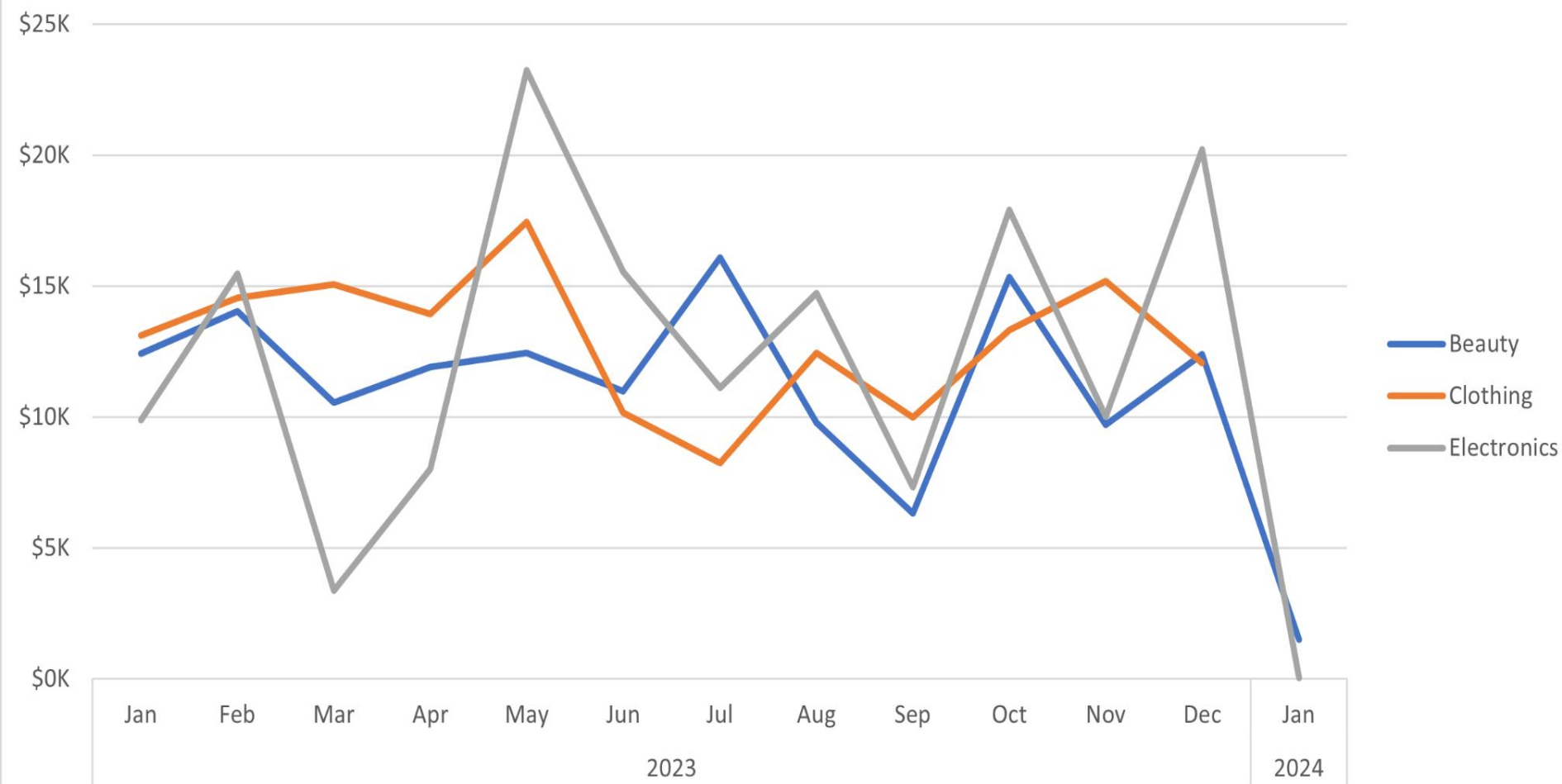
Old Adults

- Old Adults show the most high purchasing behavior across all product categories.
- It is highly suggested to promote the products corresponding to their age preferences.
- For clothing the shop needs to emphasize comfort, durability, and ease of use, and the brands known for quality and customer service.
- For beauty category it is effective to focus on essential personal care and health-related products. For this promotion it is appropriate to use traditional marketing channels like mail newsletters.
- For electronics this age group preferences mostly relate to user-friendly devices for health monitoring, connectivity, and entertainment. To promote this category it is important to provide in-store demonstrations and senior-friendly customer support.

How do customers adapt their shopping habits during seasonal trends?



Total Purchases by Product Category for the Year



The Analysis of the Fifth Question

- According to the analysis, customers tend to spend the most in May and the least in September.
- The most stable spending pattern is indicated during the summer period from June to August.
- Electronics: Customers spend the most in May and the least in March.
- Clothing: Spending is highest in May and lowest in July.
- Beauty products: The highest spending occurs in July, while the lowest is in September.

Suggestion Regarding the Fifth Question

Seasonal Influences (May; September)

- May often marks the beginning of warmer weather in many regions, leading to increased outdoor activities and social gatherings. This may prompt higher spending on leisure activities, travel, and outdoor gear.
- May often coincides with tax refunds in some regions, providing consumers with additional disposable income to spend on discretionary items.
- In some regions, May includes holidays such as Mother's Day, which may lead to increased spending on gifts and celebrations.
- In contrast, September signifies the end of summer and the transition to cooler weather.
- September, on the other hand, may see increased expenses related to back-to-school shopping, which can limit discretionary spending on other items. This indicates the possible absence of child section for each product category in the store.
- September typically lacks major holidays or gift-giving occasions, resulting in lower overall spending levels.
- In September, vacation season may wind down, leading to decreased spending on travel-related expenses.

Stable Spending Pattern During the Summer

- Many families plan vacations and travel during the summer months, leading to consistent spending across several product categories.
- Towards the end of the summer period, families typically engage in back-to-school shopping for supplies, clothing, and electronics, resulting in stable spending patterns across these categories.
- For many consumers, the summer months could coincide with vacation time and bonus payments, providing a consistent level of disposable income for spending on discretionary items.
- For many consumers, the summer months coincide with vacation time and bonus payments, providing a consistent level of disposable income for spending on discretionary items.

How to Boost September Sales, Sustain May Highs and Balanced Summer Sales

September:

Offer child-related products, including those suitable for school-age children. As well as offering products suitable for college students. Offer special promotions and discounts on school supplies, clothing, and electronics to attract families preparing for the new school year. Introduce seasonal products and decorations for fall, such as Halloween-themed items or cozy autumn apparel, to capitalize on seasonal trends.

Clear out summer inventory with end-of-season sales and markdowns to make room for fall merchandise and attract bargain-seeking customers.

May:

Capitalize on springtime festivities and holidays such as Mother's Day with special sales events and promotions to attract gift shoppers. Highlight outdoor and leisure products grilling equipment to appeal to customers enjoying warmer weather. Offer travel packages, vacation deals, and outdoor adventure experiences to tap into the desire for springtime travel and exploration.

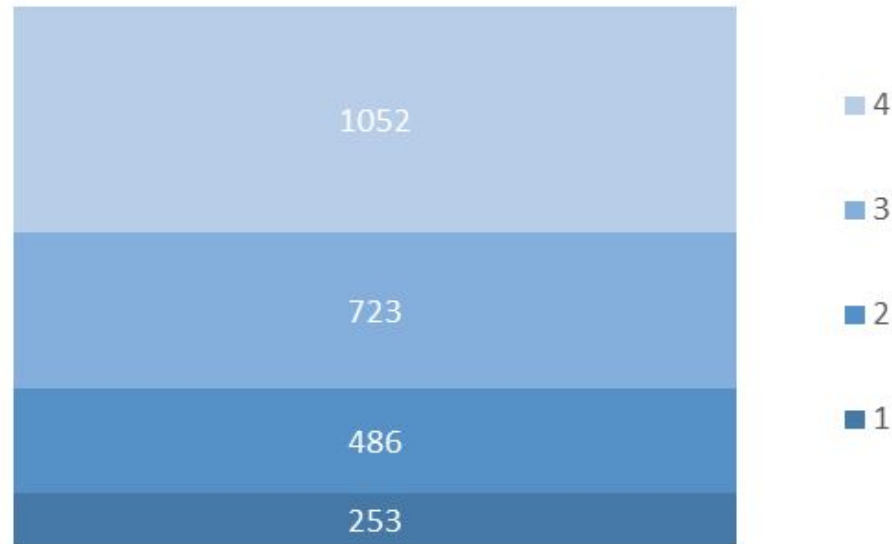
Summer Sales:

Launch summer-themed promotions such as "Summer Fun Sale" or "Beat the Heat Discounts" to create excitement and drive sales. Create staycation packages or bundles featuring products and services for customers staying close to home during the summer months. Partner with local businesses such as ice cream shops, parks, or recreational facilities for cross-promotional opportunities to enhance the summer experience for customers.

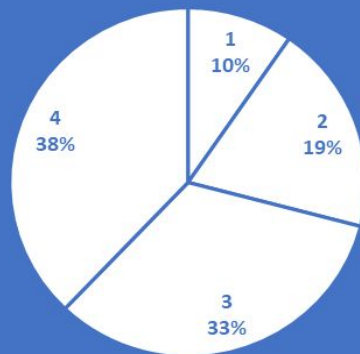
Electronics	Clothing	Beauty
<p>Highest sale in May and lowest in March</p> <p>Capitalize on the peak spending in May by offering special promotions, discounts, or bundle deals on electronic products (buy a phone and get a smartwatch with 30% discount). Consider aligning promotions with holidays like Mother's Day or Memorial Day to attract more customers.</p> <p>Adjust inventory levels to accommodate the increased demand in May and minimize excess stock during the slower months, such as March.</p> <p>Monitor sales data closely to optimize stock levels and prevent overstocking.</p> <p>Adjust inventory levels to accommodate the increased demand in May and minimize excess stock during the slower months, such as March.</p> <p>Monitor sales data closely to optimize stock levels and prevent overstocking.</p> <p>Enhance customer engagement through interactive demonstrations, product showcases, or tech workshops, especially during the peak sales period in May. Encourage customers to experience the latest electronic products firsthand to drive interest and sales.</p> <p>To increase the value of such companies during March to boost sales of electronics at its lowest point.</p>	<p>Highest sale in May and lowest in July</p> <p>Introduce new summer fashion lines and collections in May to coincide with the peak spending period. Highlight seasonal trends, lightweight fabrics, and summer essentials to attract customers looking to update their wardrobes.</p> <p>Adjust inventory levels to align with the fluctuating demand throughout the year. Increase stock levels for popular clothing items in May and reduce inventory in July to avoid overstocking during slower months.</p> <p>Develop targeted marketing campaigns to promote clothing items during the peak sales period in May. Utilize social media, email marketing, and influencer partnerships to showcase new arrivals and engage customers.</p> <p>Host fashion shows, styling workshops, or pop-up events to engage customers and generate excitement around new clothing arrivals. Offer exclusive discounts or early access to event attendees to drive sales.</p> <p>As mentioned in previous months, ensure the representation of a children's section in the store to increase the sales of school essentials in July.</p>	<p>Highest sale in July and lowest in September</p> <p>Launch targeted marketing campaigns and promotions to capitalize on the peak spending month of July. Highlight summer beauty essentials, such as sunscreen, lightweight skincare, and vibrant makeup shades, to attract customers. Create themed product bundles or beauty kits featuring summer-inspired items and limited-time offerings. Offer discounts or gifts with purchase to incentivize customers to buy more beauty products during July.</p> <p>Leverage social media platforms to share beauty tips, tutorials, and product recommendations tailored to the summer season. Engage with followers and encourage user-generated content to build brand awareness and drive sales.</p> <p>Partner with influencers, beauty bloggers, or local businesses to co-create content or host joint promotions. Collaborations can expand reach and attract new customers interested in summer beauty trends.</p> <p>Highlight multi-functional products or travel-sized items for convenience.</p> <p>To boost the sales in September offer back-to-school promotions or discounts on beauty essentials suitable for college students or young adults preparing for the new school year.</p>

Are there distinct purchasing behaviors based on the number of items bought per transaction?

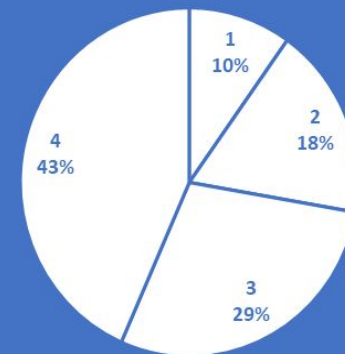
Total Transactions by Number of Items Purchased



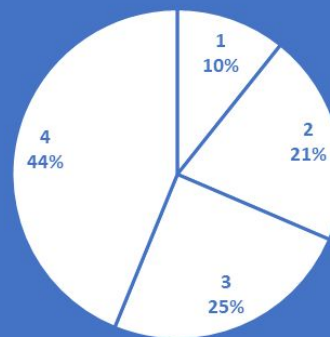
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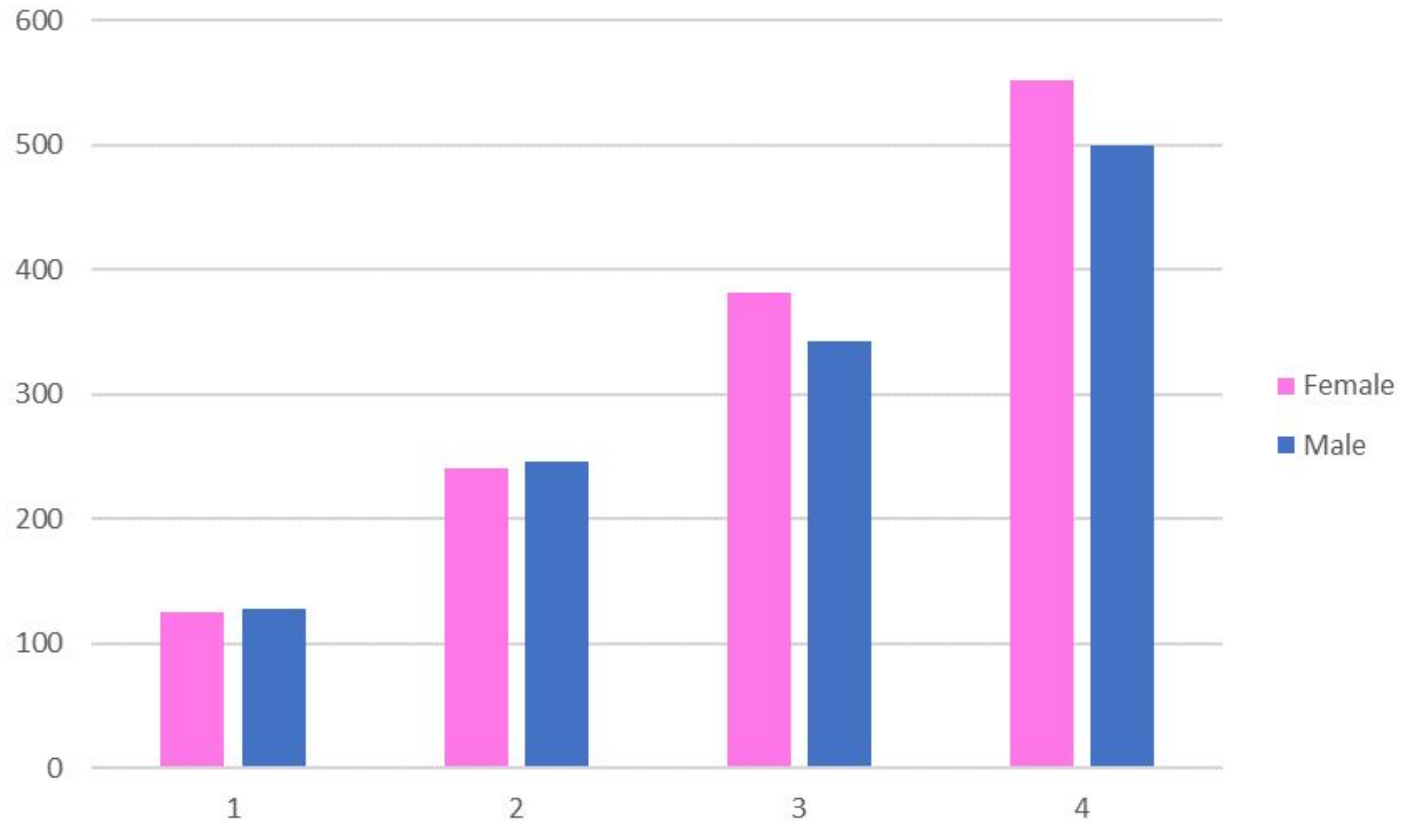
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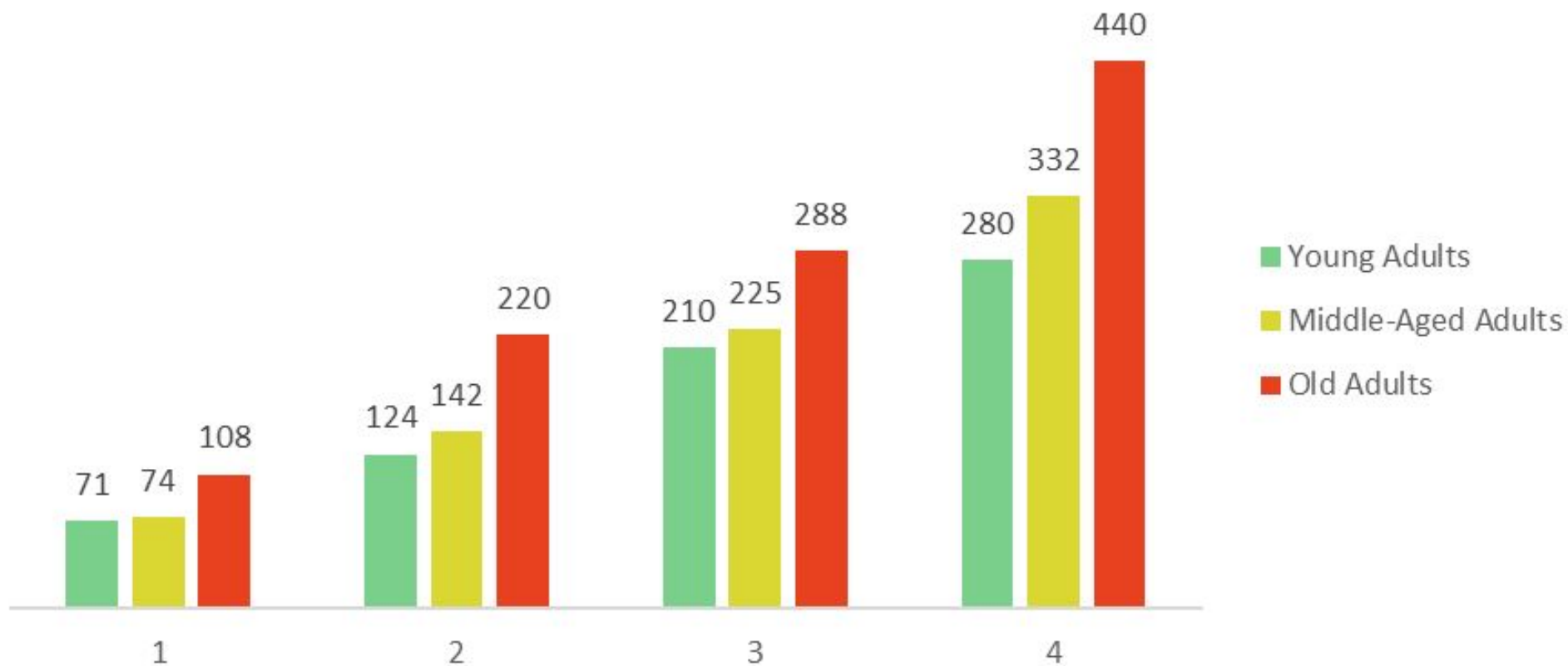
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Gender Comparison of Total Transactions by Number of Items Purchased



Age-Group Comparison of Total Transactions by Number of Items Purchased



The Analysis of the Sixth Question

- Based on the analysis, customers tend to buy more than one item per transaction.
- This trend is consistent across several product categories, as customers often purchase multiple items from each category in a single transaction.
- A comparison between male and female customers reveals that there is no significant difference in the number of items purchased by both genders, indicating that both groups tend to buy more than one item per transaction.
- Different age groups also exhibit the same pattern of purchasing more than one item per transaction. However, Old Adults demonstrate the most active purchasing behavior, as they not only buy more than one item but also purchase the most.

Suggestion Regarding the Sixth Question

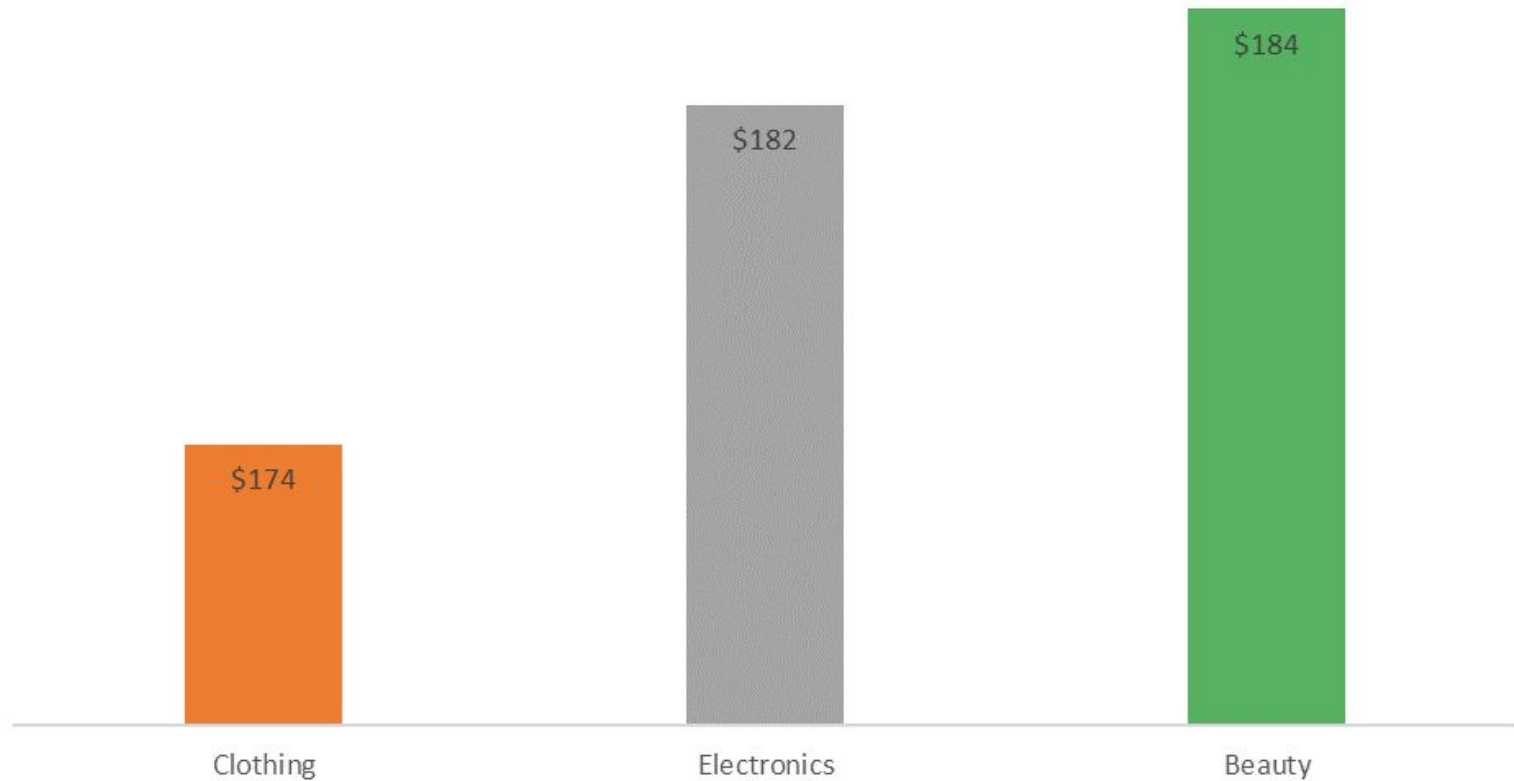
- **Bundle Deals and Cross-Selling:** Offer bundle deals or package discounts for complementary products to encourage customers to purchase multiple items in a single transaction. Cross-selling strategies can also be implemented to suggest additional items that complement the customer's initial purchase.
- **Product Placement and Merchandising:** Arrange products strategically in-store or online to encourage add-on purchases. Display related items together or feature product bundles prominently to prompt customers to buy more than one item.
- **Promotions and Incentives:** Implement promotions such as "Buy One, Get One" offers, volume discounts, or loyalty rewards for customers who purchase multiple items in a single transaction. Incentivizing bulk purchases can increase the average transaction value.
- **Personalized Recommendations:** Leverage customer data and purchase history to provide personalized product recommendations. Tailored suggestions can guide customers towards purchasing multiple items that align with their preferences and needs.
- **Convenience and Ease of Purchase:** Streamline the checkout process both online and in-store to make it easy for customers to add multiple items to their cart or basket. Simplifying the transaction process can encourage impulse purchases and increase the likelihood of buying more than one item.
- **Customer Experience Enhancement:** Focus on delivering exceptional customer service and shopping experiences. Train staff to assist customers with product recommendations and provide a seamless shopping journey that encourages additional purchases.

What insights can be gleaned from the distribution of product prices within each category?

Product Category	Min. Price
Beauty	\$25
Clothing	\$25
Electronics	\$25

Product Category	Max. Price
Beauty	\$500
Clothing	\$500
Electronics	\$500

Comparison of Average Prices Across Products



The Analysis of the Seventh Question

- The maximum and minimum prices are similar across different product categories.
- The average price of beauty products is higher than that of electronics and clothing; however, the difference is not significant, indicating almost the same price range across these product categories.
- The overall pricing of the product categories are nearly similar.
- The prices are relatively competitive and affordable, even cheap.

Suggestion Regarding the Seventh Question

- Create bundle deals or package offers combining products from different categories, as there are no significant price differences between the categories. This strategy can help generate income by selling different product categories per transaction and increase the sales rate of specific product categories if their purchase rate is much lower than in other categories.
- Differentiate offerings by providing value-added services such as extended warranties, free shipping, or personalized consultations. Highlighting these additional services can justify pricing and enhance the overall customer experience.
- Conduct regular market research to stay informed about evolving customer preferences, industry trends, and pricing dynamics. Understanding market demands and consumer behavior can inform pricing decisions and ensure alignment with market expectations.
- To ensure the representation of more expensive products in the store, which can attract customers with preferences for popular brand products or higher-priced items.

Overall Analysis of the Fluctuations in Client's Sales Performance

- Multi-Item Purchases: Customers across genders and age groups exhibit a consistent pattern of purchasing more than one item per transaction. This suggests a propensity towards bundled purchases or the simultaneous acquisition of multiple products during shopping trips.
- Gender Comparison: Both male and female customers demonstrate a tendency to buy multiple items per transaction. While there are slight fluctuations in monthly spending patterns between male and female customers, the total spending over the year does not exhibit a significant difference between the two groups.
- Age Group Analysis: Across different age groups, the trend of purchasing multiple items per transaction remains consistent. However, there are variations in the level of purchasing activity. Old Adults stand out as the most active purchasers, not only buying more than one item but also accounting for the highest total spend.

However.....

Several issues were identified during the analysis of the provided data

- It is unclear whether the transactions were conducted in a physical store or online.
- It was not specified if purchases were made using cash or online payment methods. This information could have helped understand customer preferences in the payment process.
- The categories do not clearly define which segments of products they include. For example, it is unclear if the clothing category includes children's sections or other specific items like shoes or underwear. However, given that the minimum age of customers is 18, it can be inferred that there is no children's section. Similar issues are present across other product categories, limiting the analysis of the complete picture.
- The maximum, minimum, and average prices of different product categories are almost the same, making it difficult to understand the distribution of product prices within each category and any differences.
- The questions raised for this analysis were strongly similar, which made it possible to use a specific analysis for several questions.
- The location of the store and the currency used were not identified, which made it impossible to conduct location-based analysis.
- Finally, the sample sizes from different customer groups were not sufficient to make a precise analysis, which would have reflected the reality of purchase patterns.

Thank you for your attention.....

With best regards,
The best team in the world.....