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JAR ASSIGNMENT TASK

September 5th 2024

1. Walmart Sales Analysis:

A. Analyze the performance of sales and revenue at the city and branch level (5 marks)

```
1 # Total revenue means we need to multiply quantity * unit price
2 data['Revenue'] = data['Quantity'] * data['Unit price']
3
4
5 sales_revenue_performance = data.groupby(['City', 'Branch']).agg(Total_sales =
6 ('Quantity', 'sum'), Total_Revenue = ('Revenue', 'sum')).reset_index()
7
8 sales_revenue_performance 🐼
```

✓ 0.0s 📄 Open 'sales_revenue_performance' in Data Wrangler

	City	Branch	Total_sales	Total_Revenue
0	Mandalay	A	637	34130.09
1	Mandalay	B	664	37215.93
2	Mandalay	C	519	29794.62
3	Naypyitaw	A	648	35985.64
4	Naypyitaw	B	604	35157.75
5	Naypyitaw	C	579	34160.14
6	Yangon	A	598	33647.27
7	Yangon	B	631	35193.51
8	Yangon	C	630	32302.43

B. What is the average price of an item sold at each branch of the city (10 marks)

```
1 average_price_by_branch = data.groupby(['City', 'Branch']).agg(Average_price = ('Unit price', 'mean')).reset_index()
2 average_price_by_branch
3 🐼
```

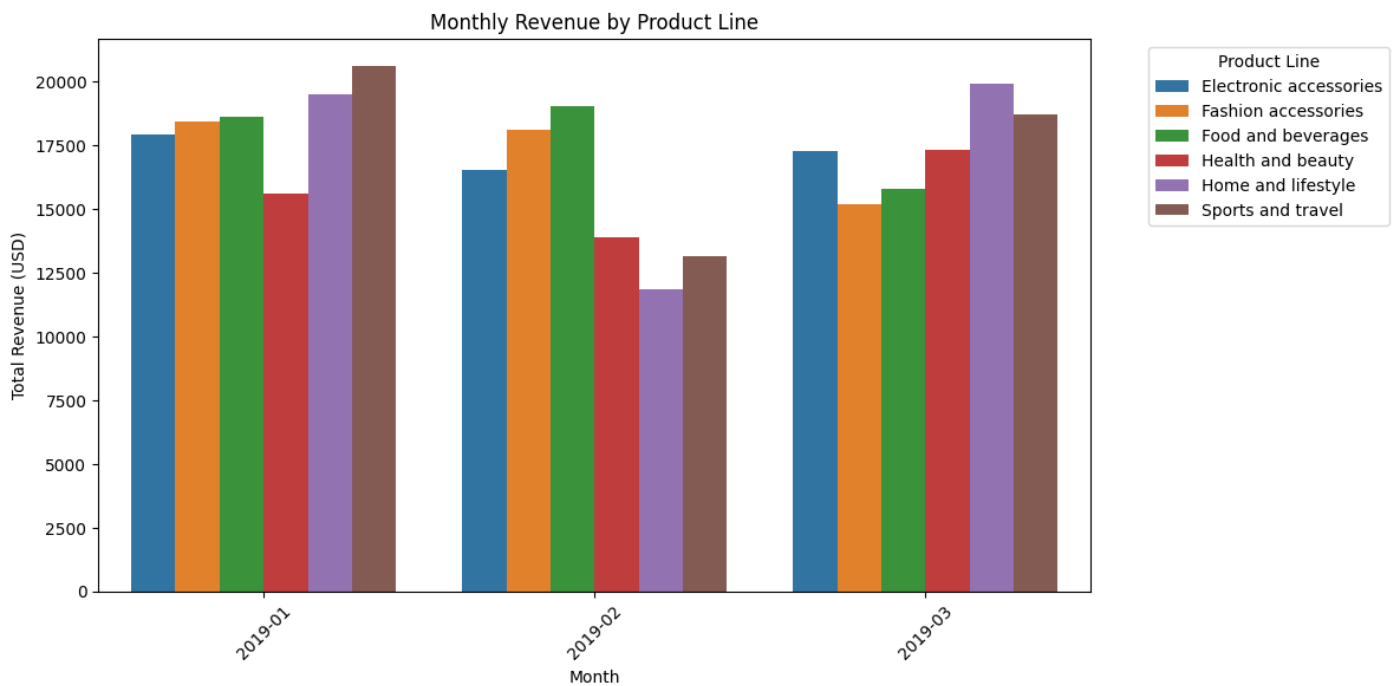
	City	Branch	Average_price
0	Mandalay	A	53.353866
1	Mandalay	B	56.133305
2	Mandalay	C	57.958316
3	Naypyitaw	A	54.123182
4	Naypyitaw	B	57.785688
5	Naypyitaw	C	57.941009
6	Yangon	A	55.639298
7	Yangon	B	56.011062
8	Yangon	C	52.684602

C. Analyze the performance of sales and revenue, Month over Month across the Product line, Gender, and Payment Method, and identify the focus areas to get better sales for April 2019. (15 marks)

Month over Month across the Product line

```
1 # Convert the 'Date' column to datetime format
2 data['Date'] = pd.to_datetime(data['Date'])
3
4 # Extract month and year from the date
5 data['YearMonth'] = data['Date'].dt.to_period('M')
6
7 # Group by YearMonth, Product line
8 monthly_performance_by_product_line = data.groupby(['YearMonth', 'Product line']).agg(
9     Total_Sales=('Quantity', 'sum'),
10    Total_Revenue=('Revenue', 'sum')
11 ).reset_index() 🐼
12
13 monthly_performance_by_product_line
```

	YearMonth	Product line	Total_Sales	Total_Revenue
0	2019-01	Electronic accessories	333	17934.56
1	2019-01	Fashion accessories	336	18423.92
2	2019-01	Food and beverages	325	18638.60
3	2019-01	Health and beauty	254	15603.02
4	2019-01	Home and lifestyle	342	19518.80
5	2019-01	Sports and travel	375	20635.26
6	2019-02	Electronic accessories	313	16536.10
7	2019-02	Fashion accessories	295	18104.63
8	2019-02	Food and beverages	349	19047.96
9	2019-02	Health and beauty	266	13906.91
10	2019-02	Home and lifestyle	205	11842.27
11	2019-02	Sports and travel	226	13152.01
12	2019-03	Electronic accessories	325	17279.37
13	2019-03	Fashion accessories	271	15191.35
14	2019-03	Food and beverages	278	15784.72
15	2019-03	Health and beauty	334	17341.25
16	2019-03	Home and lifestyle	364	19935.99
17	2019-03	Sports and travel	319	18710.66



Insights:

- Electronic accessories:** Relatively stable, but there is a room for growth. Focus on new or innovative electronic accessories may push the sales growth.
- Home and lifestyle:** Shows dramatic improvement from february to march, becoming top revenue generater in march. Focus on running targeted promotions and also expand the product range if possible.
- Sports and travel:** we can observe the dip in feb, but rebounded strongly in march. To maintain this upward trend. Focus on marketing campains that focus on outdoor activites and travelling and introduce new seasonal sports equipment.
- Health and beauty:** This category showed steady growth(not a high growth or high downfall). Focus on offers that give special discounts or gift with purchase prmotions.
- Fashion accessories and Food and beverages:** Stable in january and febraury but experienced some decline in march. Better to focus on these categories to reverse the trend. Offer special discounts and refresh the product with new and seasonally appropriate items.

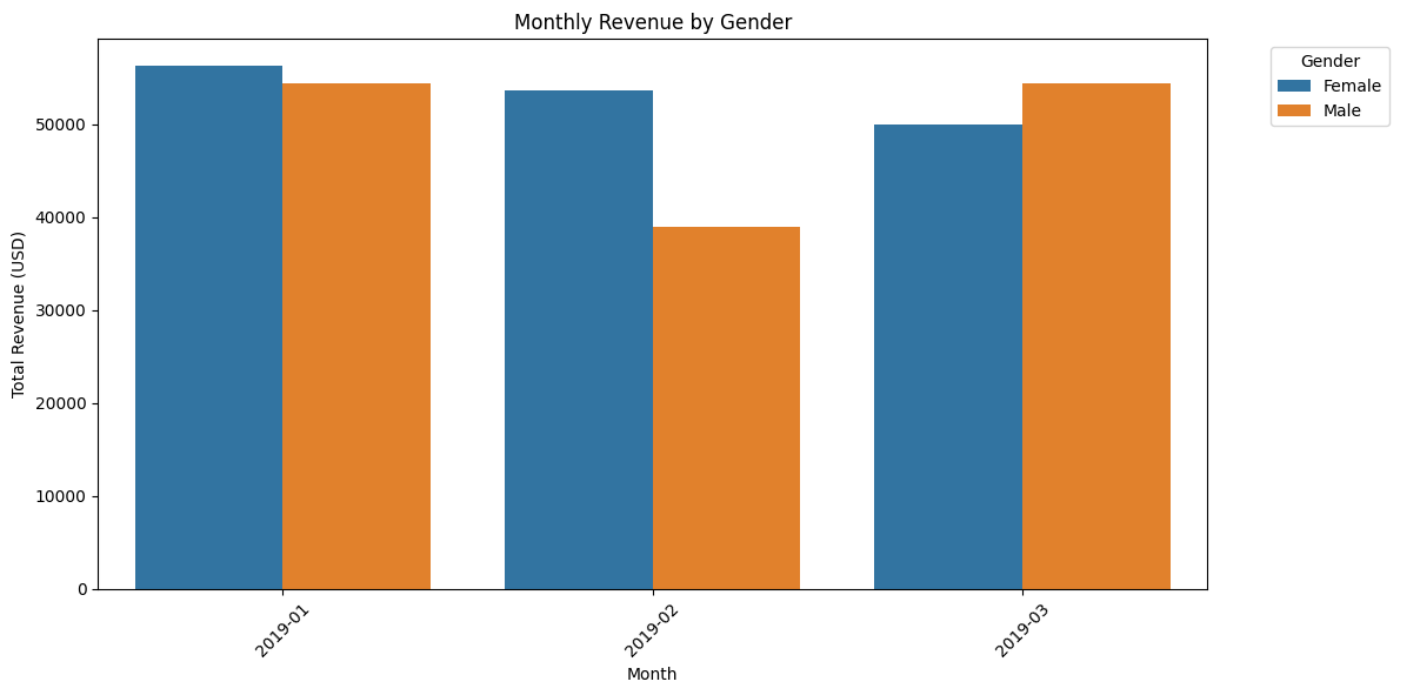
Month over month by Gender

```

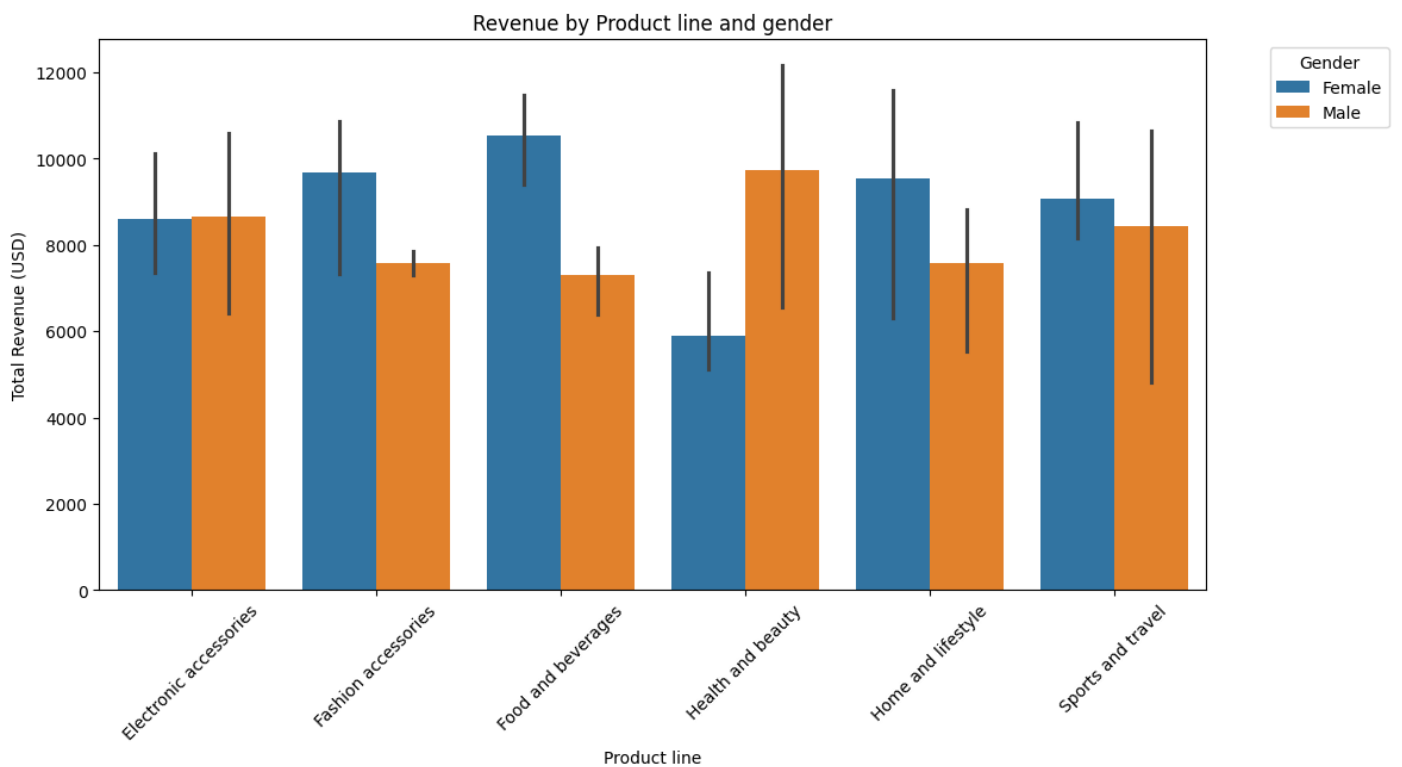
1
2 # Group by YearMonth, Product Line
3 monthly_performance_by_gender = data.groupby(['YearMonth', 'Gender']).agg(
4     Total_Sales=('Quantity', 'sum'),
5     Total_Revenue=('Revenue', 'sum')
6 ).reset_index()
7
8 monthly_performance_by_gender

```

	YearMonth	Gender	Total_Sales	Total_Revenue
0	2019-01	Female	1019	56322.84
1	2019-01	Male	946	54431.32
2	2019-02	Female	951	53652.91
3	2019-02	Male	703	38936.97
4	2019-03	Female	899	49912.75
5	2019-03	Male	992	54330.59



```
1 plt.figure(figsize=(12, 6))
2 sns.barplot(data=monthly_performance, x='Product line', y='Total_Revenue', hue='Gender')
3
4 # Adding Labels and title 🐼
5 plt.title('Revenue by Product line and gender')
6 plt.xlabel('Product line')
7 plt.ylabel('Total Revenue (USD)')
8 plt.xticks(rotation=45)
9 plt.legend(title='Gender', bbox_to_anchor=(1.05, 1), loc='upper left')
10 plt.show()
```



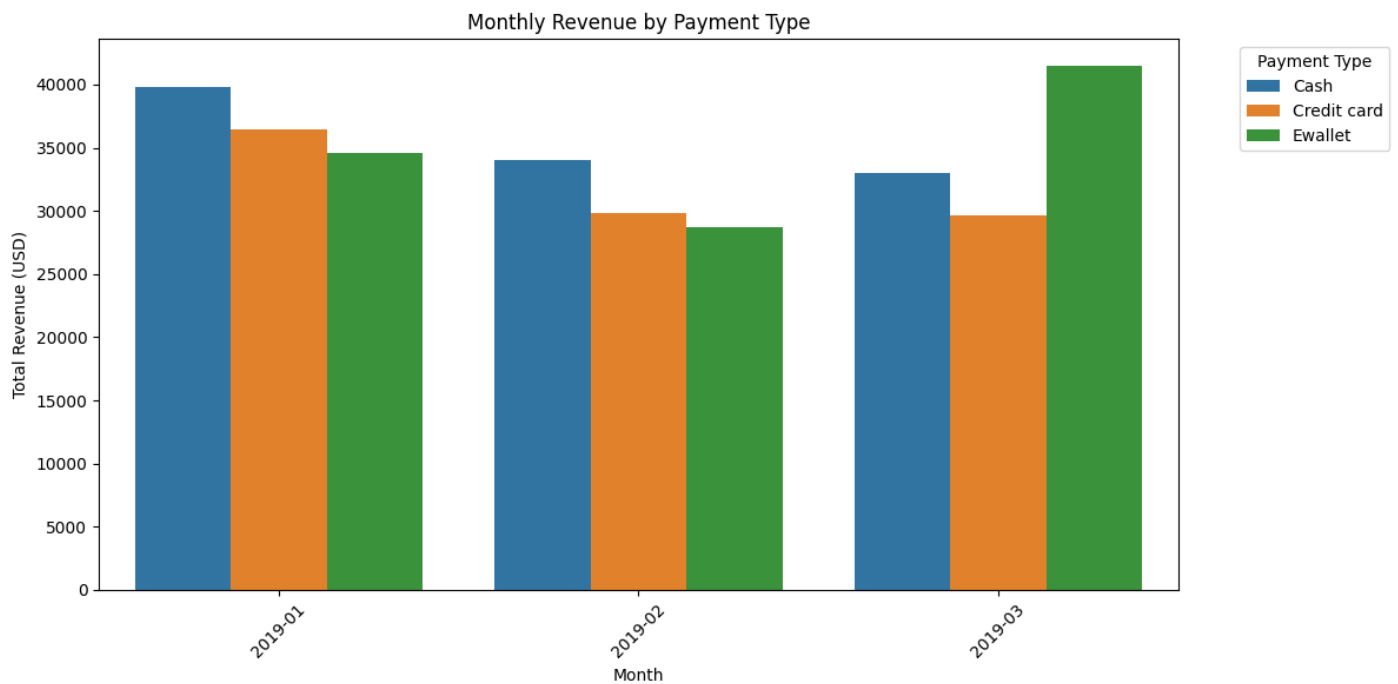
Insights:

1. **Electronic accessories:** Balanced revenue across genders. Maintain this balance while looking for opportunities to increase overall sales.
2. **Fashion accessories:** Significant gap between female and male revenue. Create targeted marketing campaigns for men to increase their engagement.
3. **Food and beverages:** Significant gap between female and male revenue and also largest revenue for females across all product line, Maintain and expand the offerings that are appealing to female customers. Make sure to develop strategies to increase male customer engagement.
4. **Health and beauty:** we can observe the notable difference favoring male revenue. Investigate what's driving male customers and based on that develop strategies to increase female customer engagement.
5. **Home and lifestyle:** Maintain the strong performance by continuing to offer products appealing to both genders.
6. **Sports and travel:** shows almost balanced revenue across gender. Maintain this balance while looking for opportunities to increase overall sales.

Month over Month by Payment type

```
1
2 # Group by YearMonth, Product Line
3 monthly_performance_by_payment_type = data.groupby(['YearMonth', 'Payment']).agg(
4     Total_Sales=('Quantity', 'sum'),
5     Total_Revenue=('Revenue', 'sum')
6 ).reset_index()
7
8 monthly_performance_by_payment_type
```

	YearMonth	Payment	Total_Sales	Total_Revenue
0	2019-01	Cash	708	39781.03
1	2019-01	Credit card	622	36425.31
2	2019-01	Ewallet	635	34547.82
3	2019-02	Cash	596	34044.13
4	2019-02	Credit card	505	29866.69
5	2019-02	Ewallet	553	28679.06
6	2019-03	Cash	592	33038.24
7	2019-03	Credit card	595	29676.64
8	2019-03	Ewallet	704	41528.46



Insights:

1. Prioritize every customer by accepting all forms of payment, while actively encouraging a shift towards digital payments for added convenience and security.

2. App Exploration: (5 marks)

Explore the features and user experience of the Jar app. Identify two aspects that you think could be significantly improved and explain your reasoning behind each suggestion.

1. Onboarding Process

The onboarding process in the Jar app is straightforward but could benefit from more personalization. Currently, users go through a standard setup, which misses the opportunity to customize the experience based on their financial goals or habits.

Suggestion: A more personalized login experience would make the app more relevant to each user. For example, giving users the option to choose their financial goals—like saving for a vacation or building an emergency fund—could help create customized savings plans and relevant notifications. This approach would not only make the process more engaging but could also improve user satisfaction and retention by aligning with their personal financial objectives from the start.

2. Notifications and Engagement

The app's notifications are helpful but can sometimes feel a bit overwhelming or too generic. When users receive multiple alerts about their savings, they might start tuning them out, which can hurt overall engagement with the app.

Suggestion: The app could benefit from smarter, more personalized notifications. Rather than sending broad reminders, the alerts could be triggered by specific user actions—like nudging someone to save after they've made a big purchase. Adding interactive elements or visuals could also make these notifications more engaging and harder to ignore, increasing their effectiveness.

3. Product Optimisation: (5 marks)

The Jar app has an engagement feature called 'Spin to Win'. Right now, if 100 people come to the app each day, only 23 of them try out this spinning game. But, we know that people who spin are more likely to retain on the app and do transactions.

Now, we want to get more people to play the game. So, the question is, how can we make sure that at least 50 people out of every 100 who visit the app each day will play 'Spin to Win'? What can we do to get more people interested in spinning the wheel?

Answer

- a. **Spin Streaks:** Reward users for spinning daily with increasingly attractive bonuses for consecutive days. Missing a day resets the streak, which encourages habitual engagement.
- b. **In-App Prompts:** Add prompts during user navigation, reminding them to try the spin before they perform key actions like making a deposit or checking their savings.
- c. **Live Winner Feed:** Display a real-time feed within the app showing recent winners and their prizes, adding a sense of excitement and urgency. "Sarah just won \$10 cashback on her spin!".
- d. **Customized Rewards:** Offer prizes that are more aligned with the user's behavior. For example, if a user frequently saves for travel, offer travel-related discounts or bonuses.
- e. **Guaranteed Small Wins:** Even if the user doesn't hit a big reward, they should at least win something—like a small discount, cashback, or reward points that can be accumulated. Knowing there's always a reward encourages frequent play.

Ipynb File: https://github.com/Satwik-uppada/Jar_Assignment/blob/main/Assignment.ipynb