

WALMART SALES ANALYSIS

TASKS:

- Analyze the performance of sales and revenue at the city and branch level.
- What is the average price of an item sold at each branch of the city.
- 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.

The screenshot shows a Jupyter Notebook interface with the following content:

```
[4] import pandas as pd

# Loading the Walmart sales dataset
from google.colab import files
uploaded = files.upload()

df = pd.read_excel('WalmartSales.xlsx')
```

Below the code, a file upload dialog shows 'WalmartSales.xlsx' (70808 bytes) has been uploaded. The next code cell displays the first few rows of the dataset:

```
[5] # Display the first few rows of the dataset to understand its structure
print(df.head())
```

The output shows two tables. The first table has columns: Invoice ID, Branch, City, Customer type, Gender, and \. The second table has columns: Product line, Unit price, Quantity, Date, and Time \.

| | Invoice ID | Branch | City | Customer type | Gender | \ |
|---|-------------|--------|-----------|---------------|--------|---|
| 0 | 750-67-8428 | A | Yangon | Member | Female | |
| 1 | 226-31-3081 | A | Naypyitaw | Normal | Female | |
| 2 | 631-41-3108 | A | Yangon | Normal | Male | |
| 3 | 123-19-1176 | B | Yangon | Member | Male | |
| 4 | 373-73-7910 | C | Yangon | Normal | Male | |

| | Product line | Unit price | Quantity | Date | Time | \ |
|---|------------------------|------------|----------|-----------|----------|---|
| 0 | Health and beauty | 74.69 | 7 | 1/5/2019 | 13:08:00 | |
| 1 | Electronic accessories | 15.28 | 5 | 3/8/2019 | 10:29:00 | |
| 2 | Home and lifestyle | 46.33 | 7 | 3/3/2019 | 13:23:00 | |
| 3 | Health and beauty | 58.22 | 8 | 1/27/2019 | 20:33:00 | |
| 4 | Sports and travel | 86.31 | 7 | 2/8/2019 | 10:37:00 | |

| | Payment | Rating |
|---|---------|--------|
| 0 | EWallet | 9.1 |

WalmartSalesAnalysis.ipynb

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[5] 2 Credit card 7.4
3 Ewallet 8.4
4 Ewallet 5.3

[7] print(df.columns)

Index(['Invoice ID', 'Branch', 'City', 'Customer type', 'Gender',
'Product line', 'Unit price', 'Quantity', 'Date', 'Time', 'Payment',
'Rating'],
dtype='object')

[8] # Step 1: Calculate the 'Total' sales (Unit price * Quantity)
df['Total'] = df['Unit price'] * df['Quantity']

[9] # Question A: Performance of sales and revenue at city and branch level
city_branch_sales = df.groupby(['City', 'Branch']).agg({'Total': 'sum'}).reset_index()
print("City and Branch Level Sales and Revenue Performance:")
print(city_branch_sales)

City and Branch Level Sales and Revenue Performance:

| | City | Branch | Total |
|---|-----------|--------|----------|
| 0 | Mandalay | A | 34130.09 |
| 1 | Mandalay | B | 37215.93 |
| 2 | Mandalay | C | 29794.62 |
| 3 | Naypyitaw | A | 35985.64 |
| 4 | Naypyitaw | B | 35157.75 |
| 5 | Naypyitaw | C | 34160.14 |
| 6 | Yangon | A | 33647.27 |
| 7 | Yangon | B | 35193.51 |
| 8 | Yangon | C | 32302.43 |

Code for A:

Step 1: Calculate the 'Total' sales (Unit price * Quantity)

```
df['Total'] = df['Unit price'] * df['Quantity']
```

Question A: Performance of sales and revenue at city and branch level

```
city_branch_sales = df.groupby(['City', 'Branch']).agg({'Total': 'sum'}).reset_index()
```

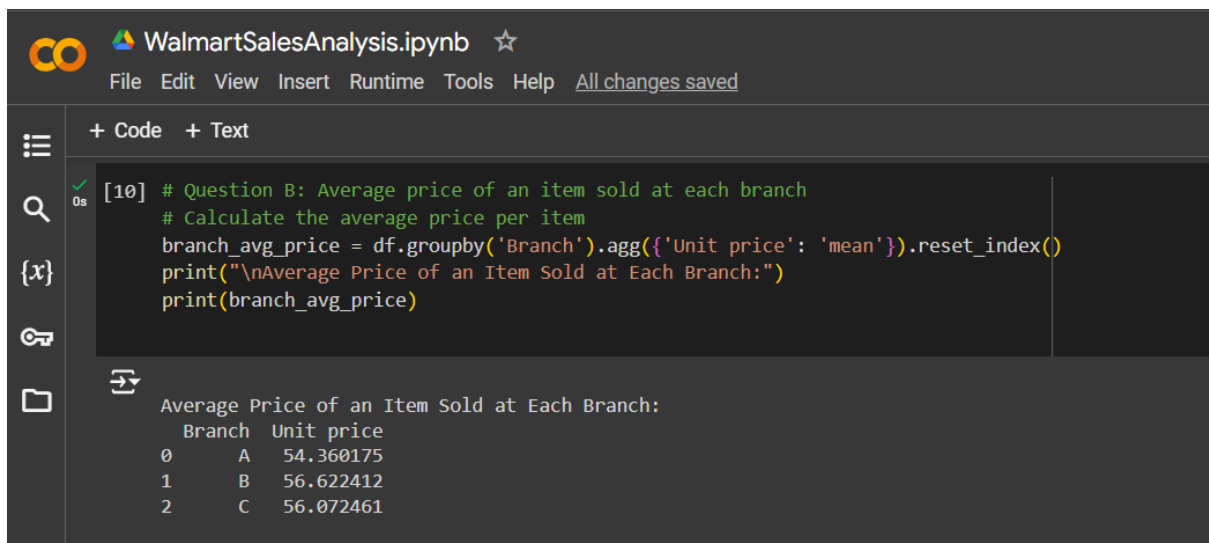
```
print("City and Branch Level Sales and Revenue Performance:")
```

```
print(city_branch_sales)
```

Output for A:

City and Branch Level Sales and Revenue Performance:

| | City | Branch | Total |
|---|-----------|--------|----------|
| 0 | Mandalay | A | 34130.09 |
| 1 | Mandalay | B | 37215.93 |
| 2 | Mandalay | C | 29794.62 |
| 3 | Naypyitaw | A | 35985.64 |
| 4 | Naypyitaw | B | 35157.75 |
| 5 | Naypyitaw | C | 34160.14 |
| 6 | Yangon | A | 33647.27 |
| 7 | Yangon | B | 35193.51 |
| 8 | Yangon | C | 32302.43 |



The screenshot shows a Jupyter Notebook titled "WalmartSalesAnalysis.ipynb". The code cell contains the following Python code:

```
[10]: # Question B: Average price of an item sold at each branch
# Calculate the average price per item
branch_avg_price = df.groupby('Branch').agg({'Unit price': 'mean'}).reset_index()
print("\nAverage Price of an Item Sold at Each Branch:")
print(branch_avg_price)
```

The output of the code is displayed below the code cell:

```
Average Price of an Item Sold at Each Branch:
  Branch  Unit price
0      A    54.360175
1      B    56.622412
2      C    56.072461
```

Code for B:

```
# Question B: Average price of an item sold at each branch
```

```
# Calculate the average price per item
```

```
branch_avg_price = df.groupby('Branch').agg({'Unit price': 'mean'}).reset_index()
```

```
print("\nAverage Price of an Item Sold at Each Branch:")

print(branch_avg_price)
```

Output for B:

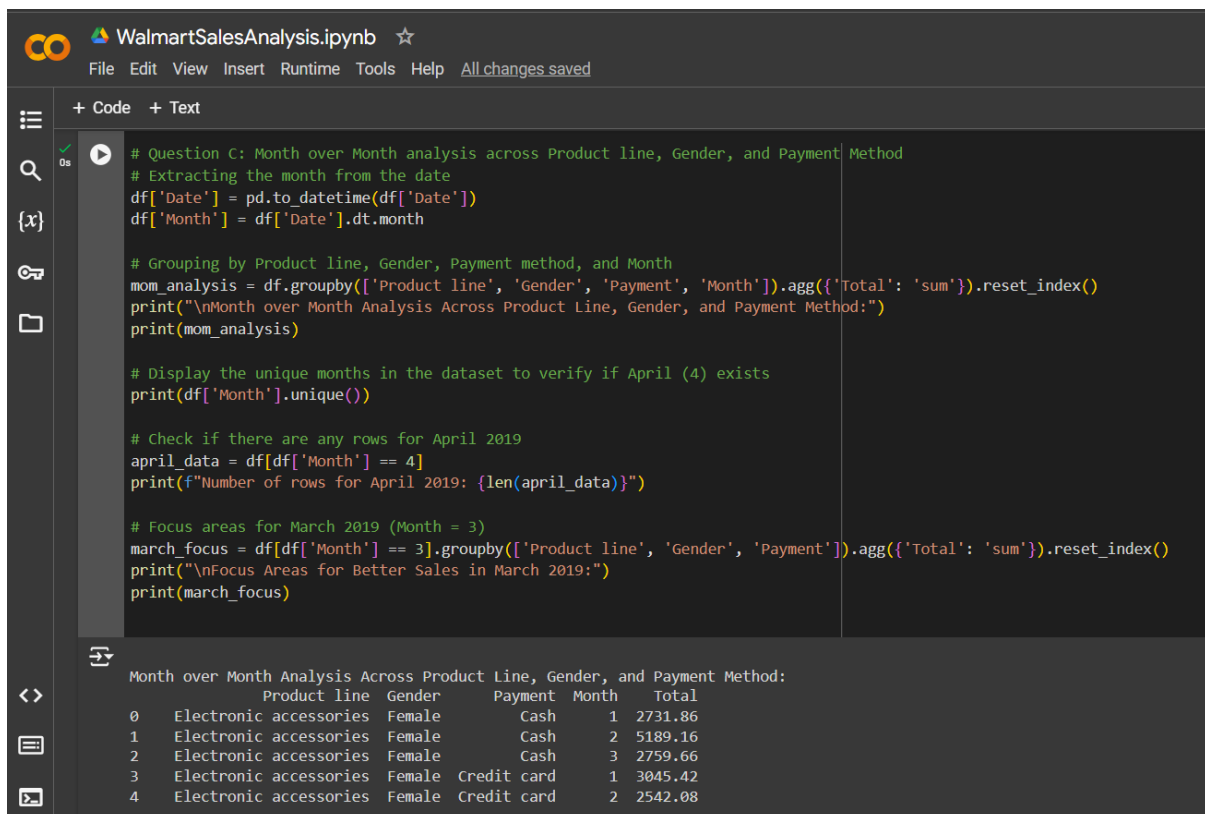
Average Price of an Item Sold at Each Branch:

Branch Unit price

0 A 54.360175

1 B 56.622412

2 C 56.072461



The screenshot shows a Jupyter Notebook interface with the title 'WalmartSalesAnalysis.ipynb'. The code cell contains the following Python code:

```
# Question C: Month over Month analysis across Product line, Gender, and Payment Method
# Extracting the month from the date
df['Date'] = pd.to_datetime(df['Date'])
df['Month'] = df['Date'].dt.month

# Grouping by Product line, Gender, Payment method, and Month
mom_analysis = df.groupby(['Product line', 'Gender', 'Payment', 'Month']).agg({'Total': 'sum'}).reset_index()
print("\nMonth over Month Analysis Across Product Line, Gender, and Payment Method:")
print(mom_analysis)

# Display the unique months in the dataset to verify if April (4) exists
print(df['Month'].unique())

# Check if there are any rows for April 2019
april_data = df[df['Month'] == 4]
print(f"Number of rows for April 2019: {len(april_data)}")

# Focus areas for March 2019 (Month = 3)
march_focus = df[df['Month'] == 3].groupby(['Product line', 'Gender', 'Payment']).agg({'Total': 'sum'}).reset_index()
print("\nFocus Areas for Better Sales in March 2019:")
print(march_focus)
```

The output cell displays the following table:

| | Product line | Gender | Payment | Month | Total |
|---|------------------------|--------|-------------|-------|---------|
| 0 | Electronic accessories | Female | Cash | 1 | 2731.86 |
| 1 | Electronic accessories | Female | Cash | 2 | 5189.16 |
| 2 | Electronic accessories | Female | Cash | 3 | 2759.66 |
| 3 | Electronic accessories | Female | Credit card | 1 | 3045.42 |
| 4 | Electronic accessories | Female | Credit card | 2 | 2542.08 |

WalmartSalesAnalysis.ipynb

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Month over Month Analysis Across Product Line, Gender, and Payment Method:

| | Product line | Gender | Payment | Month | Total |
|-----|------------------------|--------|-------------|-------|---------|
| 0 | Electronic accessories | Female | Cash | 1 | 2731.86 |
| 1 | Electronic accessories | Female | Cash | 2 | 5189.16 |
| 2 | Electronic accessories | Female | Cash | 3 | 2759.66 |
| 3 | Electronic accessories | Female | Credit card | 1 | 3045.42 |
| 4 | Electronic accessories | Female | Credit card | 2 | 2542.08 |
| .. | .. | .. | .. | .. | .. |
| 103 | Sports and travel | Male | Credit card | 2 | 1466.00 |
| 104 | Sports and travel | Male | Credit card | 3 | 3633.90 |
| 105 | Sports and travel | Male | Ewallet | 1 | 1814.55 |
| 106 | Sports and travel | Male | Ewallet | 2 | 1327.05 |
| 107 | Sports and travel | Male | Ewallet | 3 | 4930.61 |

[108 rows x 5 columns]
[1 3 2]
Number of rows for April 2019: 0

Focus Areas for Better Sales in March 2019:

| | Product line | Gender | Payment | Total |
|----|------------------------|--------|-------------|---------|
| 0 | Electronic accessories | Female | Cash | 2759.66 |
| 1 | Electronic accessories | Female | Credit card | 3052.90 |
| 2 | Electronic accessories | Female | Ewallet | 2518.46 |
| 3 | Electronic accessories | Male | Cash | 4091.62 |
| 4 | Electronic accessories | Male | Credit card | 658.81 |
| 5 | Electronic accessories | Male | Ewallet | 4197.92 |
| 6 | Fashion accessories | Female | Cash | 1445.19 |
| 7 | Fashion accessories | Female | Credit card | 3578.36 |
| 8 | Fashion accessories | Female | Ewallet | 2314.34 |
| 9 | Fashion accessories | Male | Cash | 3735.41 |
| 10 | Fashion accessories | Male | Credit card | 1631.35 |
| 11 | Fashion accessories | Male | Ewallet | 2486.70 |
| 12 | Food and beverages | Female | Cash | 3601.07 |
| 13 | Food and beverages | Female | Credit card | 2566.32 |

Code for C:

Question C: Month over Month analysis across Product line, Gender, and Payment Method

Extracting the month from the date

```
df['Date'] = pd.to_datetime(df['Date'])
```

```
df['Month'] = df['Date'].dt.month
```

Grouping by Product line, Gender, Payment method, and Month

```
mom_analysis = df.groupby(['Product line', 'Gender', 'Payment', 'Month']).agg({'Total': 'sum'}).reset_index()
```

```
print("\nMonth over Month Analysis Across Product Line, Gender, and Payment Method:")
```

```

print(mom_analysis)

# Display the unique months in the dataset to verify if April (4) exists
print(df['Month'].unique())

# Check if there are any rows for April 2019
april_data = df[df['Month'] == 4]
print(f"Number of rows for April 2019: {len(april_data)}")

# Focus areas for March 2019 (Month = 3)
march_focus = df[df['Month'] == 3].groupby(['Product line', 'Gender',
'Payment']).agg({'Total': 'sum'}).reset_index()

print("\nFocus Areas for Better Sales in March 2019:")
print(march_focus)

```

Output for C:

Month over Month Analysis Across Product Line, Gender, and Payment Method:

| | Product line | Gender | Payment | Month | Total |
|-----|------------------------|--------|-------------|-------|---------|
| 0 | Electronic accessories | Female | Cash | 1 | 2731.86 |
| 1 | Electronic accessories | Female | Cash | 2 | 5189.16 |
| 2 | Electronic accessories | Female | Cash | 3 | 2759.66 |
| 3 | Electronic accessories | Female | Credit card | 1 | 3045.42 |
| 4 | Electronic accessories | Female | Credit card | 2 | 2542.08 |
| .. | ... | ... | ... | ... | ... |
| 103 | Sports and travel | Male | Credit card | 2 | 1466.00 |
| 104 | Sports and travel | Male | Credit card | 3 | 3633.90 |
| 105 | Sports and travel | Male | Ewallet | 1 | 1814.55 |
| 106 | Sports and travel | Male | Ewallet | 2 | 1327.05 |

107 Sports and travel Male Ewallet 3 4930.61

[108 rows x 5 columns]

[1 3 2]

Number of rows for April 2019: 0

Focus Areas for Better Sales in March 2019:

| | Product line | Gender | Payment | Total |
|----|------------------------|--------|-------------|---------|
| 0 | Electronic accessories | Female | Cash | 2759.66 |
| 1 | Electronic accessories | Female | Credit card | 3052.90 |
| 2 | Electronic accessories | Female | Ewallet | 2518.46 |
| 3 | Electronic accessories | Male | Cash | 4091.62 |
| 4 | Electronic accessories | Male | Credit card | 658.81 |
| 5 | Electronic accessories | Male | Ewallet | 4197.92 |
| 6 | Fashion accessories | Female | Cash | 1445.19 |
| 7 | Fashion accessories | Female | Credit card | 3578.36 |
| 8 | Fashion accessories | Female | Ewallet | 2314.34 |
| 9 | Fashion accessories | Male | Cash | 3735.41 |
| 10 | Fashion accessories | Male | Credit card | 1631.35 |
| 11 | Fashion accessories | Male | Ewallet | 2486.70 |
| 12 | Food and beverages | Female | Cash | 3601.07 |
| 13 | Food and beverages | Female | Credit card | 2566.32 |
| 14 | Food and beverages | Female | Ewallet | 3230.27 |
| 15 | Food and beverages | Male | Cash | 1779.42 |
| 16 | Food and beverages | Male | Credit card | 1611.44 |
| 17 | Food and beverages | Male | Ewallet | 2996.20 |
| 18 | Health and beauty | Female | Cash | 1555.04 |
| 19 | Health and beauty | Female | Credit card | 1767.17 |

| | | | | |
|----|--------------------|--------|-------------|---------|
| 20 | Health and beauty | Female | Ewallet | 1874.93 |
| 21 | Health and beauty | Male | Cash | 4578.92 |
| 22 | Health and beauty | Male | Credit card | 3723.77 |
| 23 | Health and beauty | Male | Ewallet | 3841.42 |
| 24 | Home and lifestyle | Female | Cash | 2748.51 |
| 25 | Home and lifestyle | Female | Credit card | 2300.39 |
| 26 | Home and lifestyle | Female | Ewallet | 6538.18 |
| 27 | Home and lifestyle | Male | Cash | 2859.68 |
| 28 | Home and lifestyle | Male | Credit card | 2288.37 |
| 29 | Home and lifestyle | Male | Ewallet | 3200.86 |
| 30 | Sports and travel | Female | Cash | 1799.53 |
| 31 | Sports and travel | Female | Credit card | 2863.86 |
| 32 | Sports and travel | Female | Ewallet | 3398.57 |
| 33 | Sports and travel | Male | Cash | 2084.19 |
| 34 | Sports and travel | Male | Credit card | 3633.90 |
| 35 | Sports and travel | Male | Ewallet | 4930.61 |

Based on the analysis of sales performance in March 2019 across different product lines, genders, and payment methods, you can identify several focus areas and strategies to potentially increase sales in April 2019. Here are some actionable suggestions:

1. Promote High-Performing Product Lines:

- **Electronic Accessories and Health and Beauty:** These categories performed well across different gender and payment methods. For instance, males using Ewallet spent \$4,197.92 on Electronic Accessories, and \$4,578.92 on Health and Beauty products using cash. Consider increasing promotional efforts, discounts, or special offers for these product lines to attract more customers.

2. Target Gender-Specific Campaigns:

- **Males in Health and Beauty and Electronic Accessories:** Males seem to have a strong preference for Health and Beauty products (e.g., \$4,578.92 with cash) and Electronic Accessories (e.g., \$4,091.62 with cash). Tailoring specific

marketing campaigns or bundles targeting male customers could further boost sales.

- **Females in Fashion Accessories and Home and Lifestyle:** Females spent significantly on Fashion Accessories (e.g., \$3,578.36 with credit cards) and Home and Lifestyle (e.g., \$6,538.18 with Ewallet). You could create female-focused marketing campaigns, perhaps offering special deals on these products.

3. Encourage Use of Ewallet and Credit Cards:

- **Ewallet:** Across many product lines, transactions made via Ewallet are significant. For example, Female customers spent \$6,538.18 on Home and Lifestyle using Ewallet. Promoting the use of Ewallet with cashback offers or rewards could incentivize more customers to use this payment method, which appears to be popular.
- **Credit Cards:** Similarly, consider promotions that encourage credit card usage, as it also sees substantial use across product lines, particularly in Fashion Accessories.

4. Increase Cross-Selling Opportunities:

- **Complementary Products:** Given the strong sales in categories like Health and Beauty and Fashion Accessories, consider cross-promoting these products. For example, a customer purchasing Health and Beauty items might be interested in complementary Fashion Accessories.
- **Bundling Offers:** Create bundle deals that pair high-performing items, such as combining popular Electronic Accessories with Sports and Travel items at a discount.

5. Analyze Low-Performing Areas:

- **Male Customers and Credit Cards in Electronic Accessories:** While male customers generally spend well on Electronic Accessories, the spending with credit cards (\$658.81) is relatively low. Investigate if there's a specific reason for this (e.g., lack of promotions or credit card rewards) and consider targeted campaigns to increase this segment.
- **Focus on Underperforming Product Lines:** Identify product lines that aren't performing as well, like Food and Beverages for male customers using credit cards (\$1,611.44). You might consider targeted discounts or bundled offers to boost these sales.

6. Seasonal Promotions and New Product Launches:

- **Prepare for Spring Season:** If applicable, introduce seasonal products or spring-themed promotions, particularly in categories like Sports and Travel and Home and Lifestyle, which might see increased demand as the weather improves.
- **Introduce New Products or Variants:** Launching new product lines or variants within strong categories (e.g., new health and beauty items) could drive interest and sales.

Conclusion:

By focusing on these strategies, you can aim to replicate and enhance the strong sales performance seen in March 2019. Tailoring promotions to high-performing segments, optimizing payment method incentives, and addressing underperforming areas should help in achieving better sales in April 2019.