

3 Branches, 3 Months, 1 Goal: Decoding Supermarket Sales Patterns

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CONTEXT

- Supermarkets are rapidly expanding in densely populated cities, leading to increased market competition. This dataset captures historical sales from a supermarket company, recorded across three branches over a three-month period. While limited in time range, the dataset is structured in a way that makes it suitable for applying predictive and exploratory data analytics techniques.

BUSINESS PROBLEM

- With supermarkets rapidly expanding in dense urban areas, competition is intensifying. This project aims to analyze short-term sales data from three branches to uncover performance patterns and product trends. Despite the limited timeframe, the goal is to support strategic decisions in inventory, marketing, and operations to enhance competitiveness and drive growth.

LINK

- Kaggle: <https://www.kaggle.com/datasets/aungpyaeap/supermarket-sales/data>

DASHBOARD



(right click + open link)

DATA TO BE IDENTIFIED

1. SALES & REVENUE INSIGHTS

- 1.1 What is the total revenue, and how does it vary across different branches?
- 1.2 Which product line generates the highest revenue?
- 1.3 Which product line sells the most in terms of quantity?
- 1.4 Which branch is the most profitable, and why?
- 1.5 What are the peak sales hours and days of the week?

2. CUSTOMER BEHAVIOR ANALYSIS

- 2.1 Which gender spends more on average, and in which product line?
- 2.2 Which customer type (Member vs. Normal) contributes more to total revenue?
- 2.3 Is there a difference in purchasing behavior across different cities?

2.4 How does customer spending vary by payment method?

3. PRODUCT & INVENTORY ANALYSIS

- 3.1 Which product lines have the highest and lowest sales?*
- 3.2 Is there a correlation between unit price and quantity sold?*
- 3.3 Are some product lines consistently underperforming?*
- 3.4 Which product lines have the highest gross margin?*

4. PRICING & DISCOUNT ANALYSIS

- 4.1 How does the tax impact total sales and profitability?*
- 4.2 Do higher-priced products sell less compared to lower-priced ones?*
- 4.3 Which branch offers the highest average unit price?*

5. CUSTOMER SATISFACTION (RATINGS ANALYSIS)

- 5.1 Which branch has the highest and lowest customer ratings?*
- 5.2 Which product line has the best and worst ratings?*
- 5.3 Is there a relationship between total sales and customer ratings?*
- 5.4 Do high-spending customers leave better ratings?*

6. PAYMENT & TRANSACTION ANALYSIS

- 6.1 Which payment method is most commonly used?*
- 6.2 Are there differences in spending based on the payment method? Do customers using a specific payment method buy more expensive products?*

7. TREND & TIME-BASED ANALYSIS

- 7.1 Are there seasonal trends in supermarket sales by branch?*
- 7.2 Is revenue increasing or decreasing over time?*

DATA PREPARATION

1. Removed duplicate entries to ensure data accuracy and consistency.

The screenshot shows the Microsoft Excel interface with a data table titled 'Supermarket Sales - Excel'. The table has columns for Invoice ID, Branch, City, Customer type, Gender, Product line, Unit price, Quantity, Tax 5%, Total Purchase Price, Date, Day of the Week, Time, Payment, Cost of Goods Sold, and gross margin per. A dialog box is open in the center of the screen, displaying the message 'No duplicate values found.' with an 'OK' button.

| Invoice ID | Branch | City | Customer type | Gender | Product line | Unit price | Quantity | Tax 5% | Total Purchase Price | Date | Day of the Week | Time | Payment | Cost of Goods Sold | gross margin per |
|-------------|--------|--------|---------------|--------|------------------------|------------|----------|--------|----------------------|-----------|-----------------|-------|-------------|--------------------|------------------|
| 750-67-8428 | A | Yangon | Member | Female | Health and beauty | 74.69 | 7 | 26.14 | 548.97 | 1/5/2019 | Sat | 13:08 | Ewallet | 522.83 | |
| 631-41-3108 | A | Yangon | Normal | Male | Home and lifestyle | 46.33 | 7 | 16.22 | 340.53 | 3/3/2019 | Sun | 13:23 | Credit card | 324.31 | |
| 123-19-1176 | A | Yangon | Member | Male | Health and beauty | 58.22 | 8 | 23.29 | 489.05 | 1/27/2019 | Sun | 20:33 | Ewallet | 465.76 | |
| 373-73-7910 | A | Yangon | Normal | Male | Sports and travel | 86.31 | 7 | 30.21 | 634.38 | 2/8/2019 | Fri | 10:37 | Ewallet | 604.17 | |
| 355-53-5943 | A | Yangon | Member | Female | Electronic accessories | 68.84 | 6 | 20.65 | 433.69 | 2/25/2019 | Mon | 14:36 | Ewallet | 413.04 | |
| 665-32-9167 | A | Yangon | Member | Female | Health and beauty | 36.26 | 2 | 3.63 | 76.15 | 1/10/2019 | Thu | 17:15 | Credit card | 72.52 | |
| 365-64-0515 | A | Yangon | Normal | Female | Electronic accessories | 46.95 | 5 | 11.74 | 246.49 | 2/12/2019 | Tue | 10:25 | Ewallet | 234.75 | |
| 252-56-2699 | A | Yangon | Normal | Male | Food and beverages | 43.19 | 10 | 21.60 | 453.50 | 2/7/2019 | Thu | 16:48 | Ewallet | 431.90 | |
| 829-34-3910 | A | Yangon | Normal | Female | Health and beauty | 71.38 | 10 | 35.69 | 749.49 | 3/29/2019 | Fri | 19:21 | Cash | 713.80 | |
| 165-95-9349 | A | Yangon | Member | Female | Health and beauty | 68.93 | 7 | 24.13 | 506.64 | 3/11/2019 | Mon | 11:03 | Credit card | 482.51 | |
| 765-26-6951 | A | Yangon | Normal | Male | Sports and travel | 72.61 | 6 | 21.78 | 457.44 | 1/1/2019 | Tue | 10:39 | Credit card | 435.66 | |
| 329-62-1586 | A | Yangon | Normal | Male | Food and beverages | 54.67 | 3 | 8.20 | 172.21 | 1/21/2019 | Mon | 18:00 | Credit card | 164.01 | |
| 636-48-8204 | A | Yangon | Normal | Male | Electronic accessories | 34.56 | 5 | 8.64 | 181.44 | 2/17/2019 | Sun | 11:15 | Ewallet | 172.80 | |
| 549-59-1358 | A | Yangon | Member | Male | Sports and travel | 88.63 | 3 | 13.29 | 279.18 | 3/2/2019 | Sat | 17:36 | Ewallet | 265.89 | |
| 227-03-5010 | A | Yangon | Member | Female | Home and lifestyle | 52.59 | 8 | 21.04 | 441.76 | 3/22/2019 | Fri | 19:20 | Credit card | 420.72 | |
| 189-17-4241 | A | Yangon | Normal | Female | Fashion accessories | 87.67 | 2 | 8.77 | 184.11 | 3/10/2019 | Sun | 12:17 | Credit card | 175.34 | |
| 848-62-7243 | A | Yangon | Normal | Male | Health and beauty | 24.89 | 9 | 11.20 | 235.21 | 3/15/2019 | Fri | 15:36 | Cash | 224.01 | |
| 595-11-5460 | A | Yangon | Normal | Male | Health and beauty | 96.58 | 2 | 9.66 | 202.82 | 3/15/2019 | Fri | 10:12 | Credit card | 193.16 | |
| 129-29-8530 | A | Yangon | Member | Male | Sports and travel | 62.62 | 5 | 15.66 | 328.76 | 3/10/2019 | Sun | 19:15 | Ewallet | 313.10 | |
| 272-65-1806 | A | Yangon | Normal | Female | Electronic accessories | 60.88 | 9 | 27.40 | 575.32 | 1/15/2019 | Tue | 17:17 | Ewallet | 547.92 | |
| 162-48-8011 | A | Yangon | Member | Female | Food and beverages | 44.59 | 5 | 11.15 | 234.10 | 2/10/2019 | Sun | 15:10 | Cash | 222.95 | |
| 106-35-6779 | A | Yangon | Member | Male | Home and lifestyle | 44.34 | 2 | 4.43 | 93.11 | 3/27/2019 | Wed | 11:26 | Cash | 88.68 | |
| 635-40-6220 | A | Yangon | Normal | Male | Health and beauty | 89.6 | 8 | 35.84 | 752.64 | 2/7/2019 | Thu | 11:28 | Ewallet | 716.80 | |
| 817-48-8732 | A | Yangon | Member | Female | Home and lifestyle | 72.35 | 10 | 36.18 | 759.68 | 1/20/2019 | Sun | 15:55 | Cash | 723.50 | |
| 199-75-8169 | A | Yangon | Member | Male | Sports and travel | 15.81 | 10 | 7.91 | 166.01 | 3/6/2019 | Wed | 12:27 | Credit card | 158.10 | |
| 877-22-3308 | A | Yangon | Member | Male | Health and beauty | 15.87 | 10 | 7.94 | 166.64 | 3/13/2019 | Wed | 16:40 | Cash | 158.70 | |
| 232-11-3025 | A | Yangon | Normal | Male | Sports and travel | 78.77 | 10 | 39.39 | 827.09 | 1/24/2019 | Thu | 10:04 | Cash | 787.70 | |
| 382-03-4532 | A | Yangon | Member | Female | Health and beauty | 18.33 | 1 | 0.92 | 19.25 | 2/2/2019 | Sat | 18:50 | Cash | 18.33 | |

2. Applied filters to easily identify any typos or missing values.

The screenshot shows the Microsoft Excel interface with the same data table. The 'Spending' column is now visible, and a filter has been applied to it. The filter dropdown menu is open, showing options for sorting and filtering the data. The 'Spending' column contains values such as 'High Spender', 'Medium Spender', and 'Low Spender'.

| Unit price | Quantity | Tax 5% | Total Purchase Price | Date | Day of the Week | Time | Payment | Cost of Goods Sold | gross margin percentage | gross income | Rating | Spending |
|------------|----------|--------|----------------------|-----------|-----------------|-------|-------------|--------------------|-------------------------|--------------|--------|----------------|
| 74.69 | 7 | 26.14 | 548.97 | 1/5/2019 | Sat | 13:08 | Ewallet | 522.83 | 4.76 | 26.14 | 9.10 | High Spender |
| 46.33 | 7 | 16.22 | 340.53 | 3/3/2019 | Sun | 13:23 | Credit card | 324.31 | 4.76 | 16.22 | 7.40 | Medium Spender |
| 58.22 | 8 | 23.29 | 489.05 | 1/27/2019 | Sun | 20:33 | Ewallet | 465.76 | 4.76 | 23.29 | 8.40 | High Spender |
| 86.31 | 7 | 30.21 | 634.38 | 2/8/2019 | Fri | 10:37 | Ewallet | 604.17 | 4.76 | 30.21 | 5.30 | High Spender |
| 68.84 | 6 | 20.65 | 433.69 | 2/25/2019 | Mon | 14:36 | Ewallet | 413.04 | 4.76 | 20.65 | 5.80 | High Spender |
| 36.26 | 2 | 3.63 | 76.15 | 1/10/2019 | Thu | 17:15 | Credit card | 72.52 | 4.76 | 3.63 | 7.20 | Low Spender |
| 46.95 | 5 | 11.74 | 246.49 | 2/12/2019 | Tue | 10:25 | Ewallet | 234.75 | 4.76 | 11.74 | 7.10 | Medium Spender |
| 43.19 | 10 | 21.60 | 453.50 | 2/7/2019 | Thu | 16:48 | Ewallet | 431.90 | 4.76 | 21.60 | 8.20 | High Spender |
| 71.38 | 10 | 35.69 | 749.49 | 3/29/2019 | Fri | 19:21 | Cash | 713.80 | 4.76 | 35.69 | 5.70 | High Spender |
| 68.93 | 7 | 24.13 | 506.64 | 3/11/2019 | Mon | 11:03 | Credit card | 482.51 | 4.76 | 24.13 | 4.60 | High Spender |
| 72.61 | 6 | 21.78 | 457.44 | 1/1/2019 | Tue | 10:39 | Credit card | 435.66 | 4.76 | 21.78 | 6.90 | High Spender |
| 54.67 | 3 | 8.20 | 172.21 | 1/21/2019 | Mon | 18:00 | Credit card | 164.01 | 4.76 | 8.20 | 8.60 | Medium Spender |
| 34.56 | 5 | 8.64 | 181.44 | 2/17/2019 | Sun | 11:15 | Ewallet | 172.80 | 4.76 | 8.64 | 9.90 | Medium Spender |
| 88.63 | 3 | 13.29 | 279.18 | 3/2/2019 | Sat | 17:36 | Ewallet | 265.89 | 4.76 | 13.29 | 6.00 | Medium Spender |
| 52.59 | 8 | 21.04 | 441.76 | 3/22/2019 | Fri | 19:20 | Credit card | 420.72 | 4.76 | 21.04 | 8.50 | High Spender |
| 87.67 | 2 | 8.77 | 184.11 | 3/10/2019 | Sun | 12:17 | Credit card | 175.34 | 4.76 | 8.77 | 7.70 | Medium Spender |
| 24.89 | 9 | 11.20 | 235.21 | 3/15/2019 | Fri | 15:36 | Cash | 224.01 | 4.76 | 11.20 | 7.40 | Medium Spender |
| 96.58 | 2 | 9.66 | 202.82 | 3/15/2019 | Fri | 10:12 | Credit card | 193.16 | 4.76 | 9.66 | 5.10 | Medium Spender |
| 62.62 | 5 | 15.66 | 328.76 | 3/10/2019 | Sun | 19:15 | Ewallet | 313.10 | 4.76 | 15.66 | 7.00 | Medium Spender |
| 60.88 | 9 | 27.40 | 575.32 | 1/15/2019 | Tue | 17:17 | Ewallet | 547.92 | 4.76 | 27.40 | 4.70 | High Spender |
| 44.59 | 5 | 11.15 | 234.10 | 2/10/2019 | Sun | 15:10 | Cash | 222.95 | 4.76 | 11.15 | 8.50 | Medium Spender |
| 44.34 | 2 | 4.43 | 93.11 | 3/27/2019 | Wed | 11:26 | Cash | 88.68 | 4.76 | 4.43 | 5.80 | Low Spender |
| 89.6 | 8 | 35.84 | 752.64 | 2/7/2019 | Thu | 11:28 | Ewallet | 716.80 | 4.76 | 35.84 | 6.60 | High Spender |
| 72.35 | 10 | 36.18 | 759.68 | 1/20/2019 | Sun | 15:55 | Cash | 723.50 | 4.76 | 36.18 | 5.40 | High Spender |
| 15.81 | 10 | 7.91 | 166.01 | 3/6/2019 | Wed | 12:27 | Credit card | 158.10 | 4.76 | 7.91 | 8.60 | Medium Spender |
| 15.87 | 10 | 7.94 | 166.64 | 3/13/2019 | Wed | 16:40 | Cash | 158.70 | 4.76 | 7.94 | 5.80 | Medium Spender |
| 78.77 | 10 | 39.39 | 827.09 | 1/24/2019 | Thu | 10:04 | Cash | 787.70 | 4.76 | 39.39 | 6.40 | High Spender |
| 18.33 | 1 | 0.92 | 19.25 | 2/2/2019 | Sat | 18:50 | Cash | 18.33 | 4.76 | 0.92 | 4.30 | Low Spender |

3. Standardized decimal places to two for a more uniform and readable format.

| Invoice ID | Branch | City | Customer type | Gender | Product line | Unit price | Quantity | Tax 5% | Total Purchase Price | Date | Day of the Week | Time | Payment | Cost of Goods Sold | gross margin percentage | gross income | Rating | Spending Type |
|-------------|--------|--------|---------------|--------|------------------------|------------|----------|--------|----------------------|-----------|-----------------|-------|-------------|--------------------|-------------------------|--------------|--------|----------------|
| 750-67-8428 | A | Yongon | Member | Female | Health and beauty | 74.69 | 7 | 26.14 | 548.97 | 7/5/2019 | Sun | 13:08 | Credit card | 324.31 | 4.76 | 26.14 | 9.18 | High Spender |
| 631-41-0108 | A | Yongon | Normal | Male | Home and lifestyle | 46.33 | 7 | 16.22 | 340.53 | 3/3/2019 | Sun | 13:33 | Credit card | 189.18 | 4.76 | 16.22 | 7.40 | Medium Spender |
| 125-19-1176 | A | Yongon | Member | Male | Health and beauty | 58.23 | 8 | 23.29 | 489.05 | 1/27/2019 | Sun | 20:35 | EWallet | 265.89 | 4.76 | 23.29 | 8.46 | High Spender |
| 373-73-7910 | A | Yongon | Normal | Male | Sports and travel | 86.31 | 7 | 30.21 | 634.38 | 8/8/2019 | Fri | 10:37 | EWallet | 324.31 | 4.76 | 30.21 | 5.30 | High Spender |
| 355-53-5943 | A | Yongon | Member | Female | Electronic accessories | 68.84 | 6 | 20.85 | 433.69 | 2/5/2019 | Mon | 14:36 | EWallet | 234.75 | 4.76 | 20.85 | 5.80 | High Spender |
| 665-32-6187 | A | Yongon | Member | Female | Health and beauty | 36.36 | 3 | 3.63 | 76.15 | 1/20/2019 | Thu | 17:15 | Credit card | 41.90 | 4.76 | 3.63 | 7.20 | Low Spender |
| 665-64-0515 | A | Yongon | Normal | Female | Electronic accessories | 46.95 | 5 | 11.74 | 246.49 | 2/2/2019 | Tue | 10:25 | EWallet | 129.60 | 4.76 | 11.74 | 7.10 | Medium Spender |
| 252-56-2699 | A | Yongon | Normal | Male | Food and beverages | 43.19 | 10 | 21.60 | 453.50 | 7/7/2019 | Tue | 16:48 | EWallet | 234.75 | 4.76 | 21.60 | 8.20 | High Spender |
| 626-56-9510 | A | Yongon | Normal | Female | Health and beauty | 71.38 | 10 | 35.69 | 749.49 | 9/29/2019 | Fri | 19:21 | Cash | 374.80 | 4.76 | 35.69 | 5.70 | High Spender |
| 656-95-9249 | A | Yongon | Member | Female | Health and beauty | 68.93 | 7 | 24.13 | 506.64 | 3/1/2019 | Mon | 11:03 | Credit card | 265.89 | 4.76 | 24.13 | 4.30 | High Spender |
| 765-26-6951 | A | Yongon | Normal | Male | Sports and travel | 72.65 | 6 | 21.78 | 437.44 | 1/2/2019 | Tue | 10:39 | Credit card | 234.75 | 4.76 | 21.78 | 6.90 | High Spender |
| 129-62-1586 | A | Yongon | Normal | Male | Food and beverages | 54.67 | 5 | 8.20 | 172.20 | 1/1/2019 | Mon | 18:00 | Credit card | 88.68 | 4.76 | 8.20 | 8.60 | Medium Spender |
| 636-48-8204 | A | Yongon | Normal | Male | Electronic accessories | 34.56 | 5 | 8.64 | 181.44 | 2/7/2019 | Sun | 11:15 | EWallet | 129.60 | 4.76 | 8.64 | 9.90 | Medium Spender |
| 549-59-1358 | A | Yongon | Member | Male | Sports and travel | 88.63 | 8 | 13.29 | 779.18 | 2/2/2019 | Sat | 17:38 | EWallet | 265.89 | 4.76 | 13.29 | 6.00 | High Spender |
| 127-03-5010 | A | Yongon | Member | Female | Home and lifestyle | 52.58 | 8 | 21.04 | 441.76 | 2/2/2019 | Fri | 19:20 | Credit card | 234.75 | 4.76 | 21.04 | 8.50 | High Spender |
| 189-17-4241 | A | Yongon | Normal | Female | Fashion accessories | 87.67 | 2 | 8.77 | 184.13 | 1/30/2019 | Sun | 12:17 | Credit card | 179.54 | 4.76 | 8.77 | 7.70 | Medium Spender |
| 848-62-7243 | A | Yongon | Normal | Male | Health and beauty | 24.89 | 9 | 11.20 | 235.21 | 9/5/2019 | Fri | 15:36 | Cash | 129.60 | 4.76 | 11.20 | 7.40 | Medium Spender |
| 595-11-4460 | A | Yongon | Normal | Male | Health and beauty | 98.54 | 2 | 9.86 | 202.82 | 3/5/2019 | Fri | 10:12 | Credit card | 104.01 | 4.76 | 9.86 | 5.10 | Medium Spender |
| 129-59-8550 | A | Yongon | Member | Male | Sports and travel | 62.65 | 5 | 15.66 | 318.75 | 1/30/2019 | Sun | 19:15 | EWallet | 166.63 | 4.76 | 15.66 | 7.00 | Medium Spender |
| 272-65-1806 | A | Yongon | Normal | Female | Electronic accessories | 60.88 | 9 | 27.40 | 575.31 | 1/5/2019 | Sun | 17:17 | EWallet | 313.10 | 4.76 | 27.40 | 4.70 | High Spender |
| 162-48-8011 | A | Yongon | Member | Female | Food and beverages | 44.59 | 5 | 11.25 | 234.12 | 1/20/2019 | Sun | 15:10 | Cash | 129.60 | 4.76 | 11.25 | 8.50 | Medium Spender |
| 106-35-6779 | A | Yongon | Member | Male | Home and lifestyle | 44.54 | 2 | 4.43 | 93.13 | 2/7/2019 | Wed | 11:26 | Cash | 88.68 | 4.76 | 4.43 | 5.80 | Low Spender |
| 635-40-6220 | A | Yongon | Normal | Male | Health and beauty | 89.6 | 8 | 35.84 | 752.64 | 7/7/2019 | Thu | 11:28 | EWallet | 374.80 | 4.76 | 35.84 | 6.60 | High Spender |
| 617-48-8732 | A | Yongon | Member | Female | Home and lifestyle | 72.35 | 10 | 36.18 | 759.68 | 1/20/2019 | Sun | 15:55 | Cash | 374.80 | 4.76 | 36.18 | 5.40 | High Spender |
| 199-75-1691 | A | Yongon | Member | Male | Health and beauty | 15.81 | 10 | 7.91 | 166.02 | 1/6/2019 | Wed | 12:17 | Credit card | 158.10 | 4.76 | 7.91 | 8.60 | Medium Spender |
| 877-22-3308 | A | Yongon | Member | Male | Health and beauty | 15.87 | 10 | 7.94 | 166.63 | 3/3/2019 | Wed | 16:40 | Cash | 158.10 | 4.76 | 7.94 | 5.80 | Medium Spender |
| 232-11-3025 | A | Yongon | Normal | Male | Sports and travel | 78.77 | 10 | 39.39 | 827.09 | 1/4/2019 | Thu | 10:04 | Cash | 374.80 | 4.76 | 39.39 | 6.40 | High Spender |
| 182-03-4531 | A | Yongon | Member | Female | Home and lifestyle | 18.83 | 1 | 0.92 | 18.83 | 1/2/2019 | Sat | 18:50 | Cash | 18.83 | 4.76 | 0.92 | 4.30 | Low Spender |
| 287-21-9061 | A | Yongon | Normal | Male | Home and lifestyle | 74.67 | 9 | 33.60 | 705.51 | 1/2/2019 | Tue | 10:55 | EWallet | 374.80 | 4.76 | 33.60 | 9.40 | High Spender |
| 381-20-0914 | A | Yongon | Member | Female | Fashion accessories | 20.01 | 9 | 9.00 | 189.09 | 1/2/2019 | Sat | 18:48 | Credit card | 180.09 | 4.76 | 9.00 | 5.70 | Medium Spender |
| 633-44-5566 | A | Yongon | Member | Male | Food and beverages | 49.58 | 7 | 17.28 | 352.93 | 7/7/2019 | Wed | 20:55 | Credit card | 189.18 | 4.76 | 17.28 | 7.30 | Medium Spender |
| 304-35-8843 | A | Yongon | Normal | Male | Sports and travel | 42.47 | 1 | 3.12 | 44.39 | 2/5/2019 | Wed | 16:57 | Cash | 42.47 | 4.76 | 3.12 | 5.70 | Low Spender |
| 873-51-0671 | A | Yongon | Member | Female | Sports and travel | 21.98 | 7 | 7.69 | 161.51 | 1/20/2019 | Thu | 16:42 | EWallet | 155.86 | 4.76 | 7.69 | 5.10 | Low Spender |
| 994-34-4444 | A | Yongon | Normal | Male | Electronic accessories | 97.16 | 1 | 4.86 | 102.02 | 1/6/2019 | Fri | 20:38 | EWallet | 97.16 | 4.76 | 4.86 | 7.20 | Low Spender |
| 860-92-6136 | A | Yongon | Normal | Male | Food and beverages | 52.75 | 5 | 7.91 | 166.16 | 2/2/2019 | Sat | 10:16 | EWallet | 158.25 | 4.76 | 7.91 | 9.30 | Medium Spender |
| 712-62-1842 | A | Yongon | Normal | Male | Food and beverages | 38.26 | 6 | 17.48 | 269.67 | 3/8/2019 | Thu | 16:44 | Cash | 349.58 | 4.76 | 17.48 | 9.90 | Medium Spender |
| 704-48-5927 | A | Yongon | Member | Male | Electronic accessories | 88.67 | 10 | 44.54 | 931.01 | 1/12/2019 | Sat | 14:50 | EWallet | 488.70 | 4.76 | 44.54 | 7.30 | High Spender |
| 620-74-5166 | A | Yongon | Normal | Male | Sports and travel | 62.13 | 6 | 18.64 | 391.42 | 2/2/2019 | Fri | 20:19 | Cash | 272.78 | 4.76 | 18.64 | 7.40 | High Spender |
| 645-44-1170 | A | Yongon | Member | Male | Home and lifestyle | 58.07 | 9 | 26.13 | 548.78 | 1/3/2019 | Sat | 20:07 | EWallet | 322.63 | 4.76 | 26.13 | 4.30 | High Spender |
| 642-32-2990 | A | Yongon | Member | Female | Food and beverages | 10.96 | 10 | 5.48 | 115.08 | 2/2/2019 | Sat | 20:48 | EWallet | 109.60 | 4.76 | 5.48 | 6.00 | Low Spender |

4. Renamed the "Total" column to "Total Purchase Price" for better clarity.

| Invoice ID | Total | Date |
|------------|----------|-------|
| 415 | 548.9715 | 1/5/ |
| 32 | 80.22 | 3/8/ |
| 155 | 340.5255 | 3/3/ |
| 288 | 489.048 | 1/27/ |
| 085 | 634.3785 | 2/8/ |
| 865 | 627.6165 | 3/25/ |
| 352 | 433.692 | 2/25/ |
| 78 | 772.38 | 2/24/ |
| 26 | 76.146 | 1/10/ |
| 96 | 60.816 | 2/6/ |
| 02 | 107.142 | 3/9/ |
| 375 | 246.4875 | 2/12/ |
| 595 | 453.495 | 2/7/ |
| 69 | 749.49 | 3/29/ |
| 116 | 590.436 | 1/15/ |
| 255 | 506.6355 | 3/11/ |
| 783 | 457.443 | 1/1/ |
| 305 | 172.2105 | 1/21/ |
| 33 | 84.63 | 3/11/ |
| 51 | 451.71 | 2/25/ |
| 197 | 277.137 | 3/5/ |
| 32 | 69.72 | 3/15/ |
| 54 | 181.44 | 2/17/ |
| 945 | 279.1845 | 3/2/ |
| 336 | 441.756 | 3/22/ |
| 76 | 35.196 | 2/8/ |
| 67 | 184.107 | 3/10/ |

| Invoice ID | Total Purchase Price | Date |
|------------|----------------------|-------|
| 415 | 548.97 | 1/5/ |
| 32 | 80.22 | 3/8/ |
| 155 | 340.53 | 3/3/ |
| 288 | 489.05 | 1/27/ |
| 085 | 634.38 | 2/8/ |
| 865 | 627.62 | 3/25/ |
| 352 | 433.69 | 2/25/ |
| 78 | 772.38 | 2/24/ |
| 26 | 76.15 | 1/10/ |
| 96 | 60.82 | 2/6/ |
| 02 | 107.14 | 3/9/ |
| 375 | 246.49 | 2/12/ |
| 595 | 453.50 | 2/7/ |
| 69 | 749.49 | 3/29/ |
| 116 | 590.44 | 1/15/ |
| 255 | 506.64 | 3/11/ |
| 783 | 457.44 | 1/1/ |
| 305 | 172.21 | 1/21/ |
| 33 | 84.63 | 3/11/ |
| 51 | 451.71 | 2/25/ |
| 197 | 277.14 | 3/5/ |
| 32 | 69.72 | 3/15/ |
| 54 | 181.44 | 2/17/ |
| 945 | 279.18 | 3/2/ |
| 336 | 441.76 | 3/22/ |
| 76 | 35.19 | 2/8/ |
| 67 | 184.11 | 3/10/ |

Results for Workbooks: Pivot Tables for Dashboard, Dashboard, Steps Taken

5. Added a new column to extract the day of the week from each date using the formula $=TEXT(\$K\$2, "ddd")$.

The screenshot shows the 'Transformed Data' table in Excel. A new column, 'Day of the Week', has been added to the table, containing the day of the week for each transaction date. The table includes columns for Customer type, Gender, Product line, Unit price, Quantity, Tax 5%, Total Purchase Price, Date, Day of the Week, Time, Payment, Cost of Goods Sold, gross margin percentage, gross income, Rating, and Spending Type.

| Customer type | Gender | Product line | Unit price | Quantity | Tax 5% | Total Purchase Price | Date | Day of the Week | Time | Payment | Cost of Goods Sold | gross margin percentage | gross income | Rating | Spending Type |
|---------------|--------|------------------------|------------|----------|--------|----------------------|-----------|-----------------|-------|-------------|--------------------|-------------------------|--------------|--------|----------------|
| Member | Female | Health and beauty | 74.69 | 7 | 26.14 | 548.97 | 1/5/2019 | Sat | 13:08 | Ewallet | 522.83 | 4.76 | 26.14 | 9.10 | High Spender |
| Normal | Male | Home and lifestyle | 46.33 | 7 | 16.22 | 340.53 | 3/3/2019 | Sun | 13:23 | Credit card | 324.31 | 4.76 | 16.22 | 7.40 | Medium Spender |
| Member | Male | Health and beauty | 58.22 | 8 | 23.29 | 489.05 | 1/27/2019 | Sun | 20:33 | Ewallet | 465.76 | 4.76 | 23.29 | 8.40 | High Spender |
| Normal | Male | Sports and travel | 86.31 | 7 | 30.21 | 634.38 | 2/8/2019 | Fri | 10:37 | Ewallet | 604.17 | 4.76 | 30.21 | 5.30 | High Spender |
| Member | Female | Electronic accessories | 68.84 | 6 | 20.65 | 433.69 | 2/25/2019 | Mon | 14:36 | Ewallet | 413.04 | 4.76 | 20.65 | 5.80 | High Spender |
| Member | Female | Health and beauty | 36.26 | 2 | 3.63 | 76.15 | 1/10/2019 | Thu | 17:15 | Credit card | 72.52 | 4.76 | 3.63 | 7.20 | Low Spender |
| Normal | Female | Electronic accessories | 46.95 | 5 | 11.74 | 246.49 | 2/12/2019 | Tue | 10:25 | Ewallet | 234.75 | 4.76 | 11.74 | 7.10 | Medium Spender |
| Normal | Male | Food and beverages | 43.19 | 10 | 21.60 | 453.50 | 2/7/2019 | Thu | 16:48 | Ewallet | 431.90 | 4.76 | 21.60 | 8.20 | High Spender |
| Normal | Female | Health and beauty | 71.38 | 10 | 35.69 | 749.49 | 3/29/2019 | Fri | 19:21 | Cash | 713.80 | 4.76 | 35.69 | 5.70 | High Spender |
| Member | Female | Health and beauty | 68.93 | 7 | 24.13 | 506.64 | 3/11/2019 | Mon | 11:03 | Credit card | 482.51 | 4.76 | 24.13 | 4.60 | High Spender |
| Normal | Male | Sports and travel | 72.61 | 6 | 21.78 | 457.44 | 1/1/2019 | Tue | 10:39 | Credit card | 435.66 | 4.76 | 21.78 | 6.90 | High Spender |
| Normal | Male | Food and beverages | 54.67 | 3 | 8.20 | 172.21 | 1/21/2019 | Mon | 18:00 | Credit card | 164.01 | 4.76 | 8.20 | 8.60 | Medium Spender |
| Normal | Male | Electronic accessories | 34.56 | 5 | 8.64 | 181.44 | 2/17/2019 | Sun | 11:15 | Ewallet | 172.80 | 4.76 | 8.64 | 9.90 | Medium Spender |
| Member | Male | Sports and travel | 88.63 | 3 | 13.29 | 279.18 | 3/2/2019 | Sat | 17:36 | Ewallet | 265.89 | 4.76 | 13.29 | 6.00 | Medium Spender |
| Member | Female | Home and lifestyle | 52.59 | 8 | 21.04 | 441.76 | 3/22/2019 | Fri | 19:20 | Credit card | 420.72 | 4.76 | 21.04 | 8.50 | High Spender |
| Normal | Female | Fashion accessories | 87.67 | 2 | 8.77 | 184.11 | 3/10/2019 | Sun | 12:17 | Credit card | 175.34 | 4.76 | 8.77 | 7.70 | Medium Spender |
| Normal | Male | Health and beauty | 24.89 | 9 | 11.20 | 235.21 | 3/15/2019 | Fri | 15:36 | Cash | 224.01 | 4.76 | 11.20 | 7.40 | Medium Spender |
| Normal | Male | Health and beauty | 96.58 | 2 | 9.66 | 202.82 | 3/15/2019 | Fri | 10:12 | Credit card | 193.16 | 4.76 | 9.66 | 5.10 | Medium Spender |
| Member | Male | Sports and travel | 62.62 | 5 | 15.66 | 328.76 | 3/10/2019 | Sun | 19:15 | Ewallet | 313.10 | 4.76 | 15.66 | 7.00 | Medium Spender |
| Normal | Female | Electronic accessories | 60.88 | 9 | 27.40 | 575.32 | 1/15/2019 | Tue | 17:17 | Ewallet | 547.92 | 4.76 | 27.40 | 4.70 | High Spender |
| Member | Female | Food and beverages | 44.59 | 5 | 11.15 | 234.10 | 2/10/2019 | Sun | 15:10 | Cash | 222.95 | 4.76 | 11.15 | 8.50 | Medium Spender |
| Member | Male | Home and lifestyle | 44.34 | 2 | 4.43 | 93.11 | 3/27/2019 | Wed | 11:26 | Cash | 88.68 | 4.76 | 4.43 | 5.80 | Low Spender |
| Normal | Male | Health and beauty | 89.6 | 8 | 35.84 | 752.64 | 2/7/2019 | Thu | 11:28 | Ewallet | 716.80 | 4.76 | 35.84 | 6.60 | High Spender |
| Member | Female | Home and lifestyle | 72.35 | 10 | 36.18 | 759.68 | 1/20/2019 | Sun | 15:55 | Cash | 723.50 | 4.76 | 36.18 | 5.40 | High Spender |
| Member | Male | Sports and travel | 15.81 | 10 | 7.91 | 166.01 | 3/6/2019 | Wed | 12:27 | Credit card | 158.10 | 4.76 | 7.91 | 8.60 | Medium Spender |
| Member | Male | Health and beauty | 15.87 | 10 | 7.94 | 166.64 | 3/13/2019 | Wed | 16:40 | Cash | 158.70 | 4.76 | 7.94 | 5.80 | Medium Spender |
| Normal | Male | Sports and travel | 78.77 | 10 | 39.39 | 827.09 | 1/24/2019 | Thu | 10:04 | Cash | 787.70 | 4.76 | 39.39 | 6.40 | High Spender |
| Member | Female | Health and beauty | 18.33 | 1 | 0.92 | 19.25 | 2/2/2019 | Sat | 18:50 | Cash | 18.33 | 4.76 | 0.92 | 4.30 | Low Spender |
| Normal | Male | Home and lifestyle | 74.67 | 9 | 33.60 | 705.63 | 1/22/2019 | Tue | 10:55 | Ewallet | 672.03 | 4.76 | 33.60 | 9.40 | High Spender |
| Member | Female | Fashion accessories | 20.01 | 9 | 9.00 | 189.09 | 1/12/2019 | Sat | 15:48 | Credit card | 180.09 | 4.76 | 9.00 | 5.70 | Medium Spender |
| Member | Male | Food and beverages | 49.38 | 7 | 17.28 | 362.94 | 3/27/2019 | Wed | 20:35 | Credit card | 345.66 | 4.76 | 17.28 | 7.80 | Medium Spender |
| Normal | Male | Sports and travel | 42.47 | 1 | 2.12 | 44.59 | 1/2/2019 | Wed | 16:57 | Cash | 42.47 | 4.76 | 2.12 | 5.70 | Low Spender |
| Normal | Female | Sports and travel | 21.98 | 7 | 7.69 | 161.55 | 1/10/2019 | Thu | 16:42 | Ewallet | 153.86 | 4.76 | 7.69 | 5.10 | Low Spender |
| Normal | Male | Electronic accessories | 97.16 | 1 | 4.86 | 102.02 | 3/8/2019 | Fri | 20:38 | Ewallet | 97.16 | 4.76 | 4.86 | 7.20 | Low Spender |

6. Created a "Spending Type" column by segmenting data into three percentiles (low, medium, and high spenders) to facilitate further analysis.

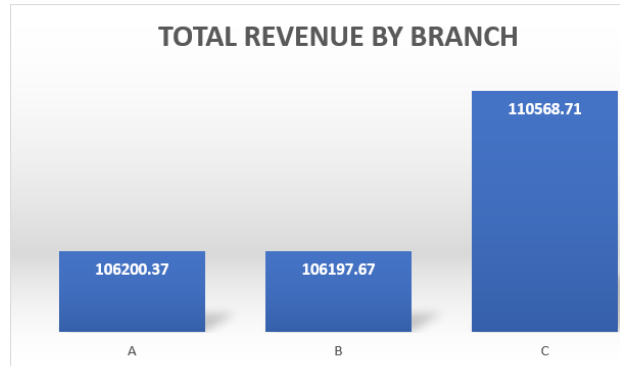
The screenshot shows the 'Transformed Data' table in Excel. A new column, 'Spending Type', has been added to the table, segmenting data into three percentiles: High Spender, Medium Spender, and Low Spender. The table includes columns for Gender, Product line, Unit price, Quantity, Tax 5%, Total Purchase Price, Date, Day of the Week, Time, Payment, Cost of Goods Sold, gross margin percentage, gross income, Rating, and Spending Type.

| Gender | Product line | Unit price | Quantity | Tax 5% | Total Purchase Price | Date | Day of the Week | Time | Payment | Cost of Goods Sold | gross margin percentage | gross income | Rating | Spending Type |
|--------|------------------------|------------|----------|--------|----------------------|-----------|-----------------|-------|-------------|--------------------|-------------------------|--------------|--------|----------------|
| Female | Health and beauty | 74.69 | 7 | 26.14 | 548.97 | 1/5/2019 | Sat | 13:08 | Ewallet | 522.83 | 4.76 | 26.14 | 9.10 | High Spender |
| Male | Home and lifestyle | 46.33 | 7 | 16.22 | 340.53 | 3/3/2019 | Sun | 13:23 | Credit card | 324.31 | 4.76 | 16.22 | 7.40 | Medium Spender |
| Male | Health and beauty | 58.22 | 8 | 23.29 | 489.05 | 1/27/2019 | Sun | 20:33 | Ewallet | 465.76 | 4.76 | 23.29 | 8.40 | High Spender |
| Male | Sports and travel | 86.31 | 7 | 30.21 | 634.38 | 2/8/2019 | Fri | 10:37 | Ewallet | 604.17 | 4.76 | 30.21 | 5.30 | High Spender |
| Female | Electronic accessories | 68.84 | 6 | 20.65 | 433.69 | 2/25/2019 | Mon | 14:36 | Ewallet | 413.04 | 4.76 | 20.65 | 5.80 | High Spender |
| Female | Health and beauty | 36.26 | 2 | 3.63 | 76.15 | 1/10/2019 | Thu | 17:15 | Credit card | 72.52 | 4.76 | 3.63 | 7.20 | Low Spender |
| Female | Electronic accessories | 46.95 | 5 | 11.74 | 246.49 | 2/12/2019 | Tue | 10:25 | Ewallet | 234.75 | 4.76 | 11.74 | 7.10 | Medium Spender |
| Male | Food and beverages | 43.19 | 10 | 21.60 | 453.50 | 2/7/2019 | Thu | 16:48 | Ewallet | 431.90 | 4.76 | 21.60 | 8.20 | High Spender |
| Female | Health and beauty | 71.38 | 10 | 35.69 | 749.49 | 3/29/2019 | Fri | 19:21 | Cash | 713.80 | 4.76 | 35.69 | 5.70 | High Spender |
| Female | Health and beauty | 68.93 | 7 | 24.13 | 506.64 | 3/11/2019 | Mon | 11:03 | Credit card | 482.51 | 4.76 | 24.13 | 4.60 | High Spender |
| Male | Sports and travel | 72.61 | 6 | 21.78 | 457.44 | 1/1/2019 | Tue | 10:39 | Credit card | 435.66 | 4.76 | 21.78 | 6.90 | High Spender |
| Male | Food and beverages | 54.67 | 3 | 8.20 | 172.21 | 1/21/2019 | Mon | 18:00 | Credit card | 164.01 | 4.76 | 8.20 | 8.60 | Medium Spender |
| Male | Electronic accessories | 34.56 | 5 | 8.64 | 181.44 | 2/17/2019 | Sun | 11:15 | Ewallet | 172.80 | 4.76 | 8.64 | 9.90 | Medium Spender |
| Male | Sports and travel | 88.63 | 3 | 13.29 | 279.18 | 3/2/2019 | Sat | 17:36 | Ewallet | 265.89 | 4.76 | 13.29 | 6.00 | Medium Spender |
| Female | Home and lifestyle | 52.59 | 8 | 21.04 | 441.76 | 3/22/2019 | Fri | 19:20 | Credit card | 420.72 | 4.76 | 21.04 | 8.50 | High Spender |
| Female | Fashion accessories | 87.67 | 2 | 8.77 | 184.11 | 3/10/2019 | Sun | 12:17 | Credit card | 175.34 | 4.76 | 8.77 | 7.70 | Medium Spender |
| Male | Health and beauty | 24.89 | 9 | 11.20 | 235.21 | 3/15/2019 | Fri | 15:36 | Cash | 224.01 | 4.76 | 11.20 | 7.40 | Medium Spender |
| Male | Health and beauty | 96.58 | 2 | 9.66 | 202.82 | 3/15/2019 | Fri | 10:12 | Credit card | 193.16 | 4.76 | 9.66 | 5.10 | Medium Spender |
| Male | Sports and travel | 62.62 | 5 | 15.66 | 328.76 | 3/10/2019 | Sun | 19:15 | Ewallet | 313.10 | 4.76 | 15.66 | 7.00 | Medium Spender |
| Female | Electronic accessories | 60.88 | 9 | 27.40 | 575.32 | 1/15/2019 | Tue | 17:17 | Ewallet | 547.92 | 4.76 | 27.40 | 4.70 | High Spender |
| Female | Food and beverages | 44.59 | 5 | 11.15 | 234.10 | 2/10/2019 | Sun | 15:10 | Cash | 222.95 | 4.76 | 11.15 | 8.50 | Medium Spender |
| Male | Home and lifestyle | 44.34 | 2 | 4.43 | 93.11 | 3/27/2019 | Wed | 11:26 | Cash | 88.68 | 4.76 | 4.43 | 5.80 | Low Spender |
| Male | Health and beauty | 89.6 | 8 | 35.84 | 752.64 | 2/7/2019 | Thu | 11:28 | Ewallet | 716.80 | 4.76 | 35.84 | 6.60 | High Spender |
| Female | Home and lifestyle | 72.35 | 10 | 36.18 | 759.68 | 1/20/2019 | Sun | 15:55 | Cash | 723.50 | 4.76 | 36.18 | 5.40 | High Spender |
| Male | Sports and travel | 15.81 | 10 | 7.91 | 166.01 | 3/6/2019 | Wed | 12:27 | Credit card | 158.10 | 4.76 | 7.91 | 8.60 | Medium Spender |
| Male | Health and beauty | 15.87 | 10 | 7.94 | 166.64 | 3/13/2019 | Wed | 16:40 | Cash | 158.70 | 4.76 | 7.94 | 5.80 | Medium Spender |
| Male | Sports and travel | 78.77 | 10 | 39.39 | 827.09 | 1/24/2019 | Thu | 10:04 | Cash | 787.70 | 4.76 | 39.39 | 6.40 | High Spender |
| Female | Health and beauty | 18.33 | 1 | 0.92 | 19.25 | 2/2/2019 | Sat | 18:50 | Cash | 18.33 | 4.76 | 0.92 | 4.30 | Low Spender |
| Male | Home and lifestyle | 74.67 | 9 | 33.60 | 705.63 | 1/22/2019 | Tue | 10:55 | Ewallet | 672.03 | 4.76 | 33.60 | 9.40 | High Spender |
| Female | Fashion accessories | 20.01 | 9 | 9.00 | 189.09 | 1/12/2019 | Sat | 15:48 | Credit card | 180.09 | 4.76 | 9.00 | 5.70 | Medium Spender |
| Male | Food and beverages | 49.38 | 7 | 17.28 | 362.94 | 3/27/2019 | Wed | 20:35 | Credit card | 345.66 | 4.76 | 17.28 | 7.80 | Medium Spender |
| Male | Sports and travel | 42.47 | 1 | 2.12 | 44.59 | 1/2/2019 | Wed | 16:57 | Cash | 42.47 | 4.76 | 2.12 | 5.70 | Low Spender |
| Female | Sports and travel | 21.98 | 7 | 7.69 | 161.55 | 1/10/2019 | Thu | 16:42 | Ewallet | 153.86 | 4.76 | 7.69 | 5.10 | Low Spender |
| Male | Electronic accessories | 97.16 | 1 | 4.86 | 102.02 | 3/8/2019 | Fri | 20:38 | Ewallet | 97.16 | 4.76 | 4.86 | 7.20 | Low Spender |

INTERPRETATION AND REPORTING

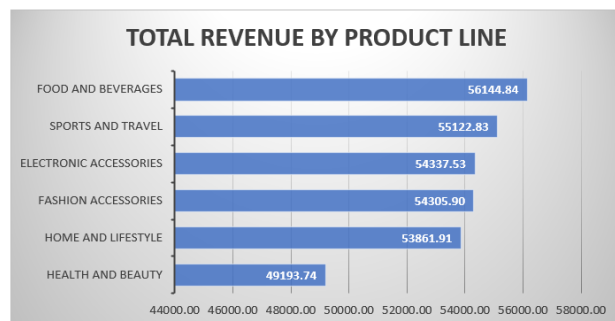
1. SALES & REVENUE INSIGHTS

1.1 What is the total revenue, and how does it vary across different branches?



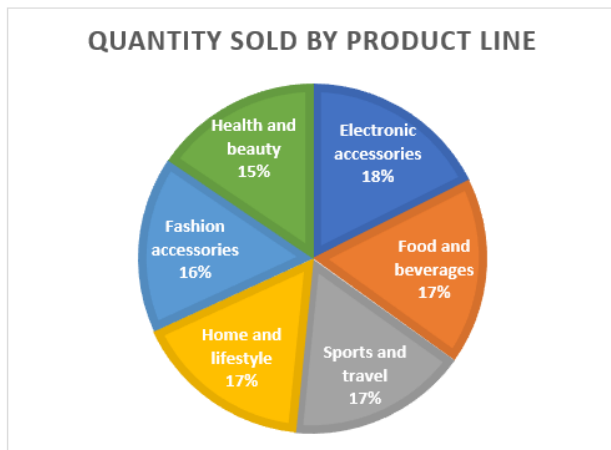
The total revenue of the three branches is \$322,966.75 and as the details show, there's a little difference between branch A and B while the branch C garnered the highest number of sales.

1.2 Which product line generates the highest revenue?



The product line that generates the highest revenue is Food and Beverages having \$56,144.83 in total revenue.

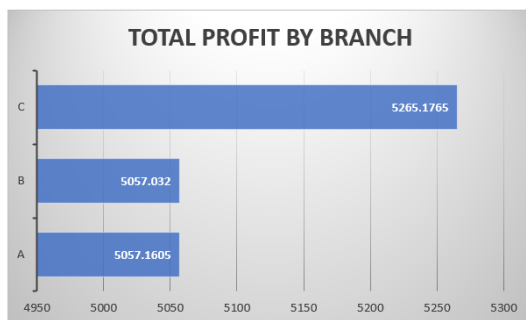
1.3 Which product line sells the most in terms of quantity?



The product line that sells the most in terms of quantity is Electronics Accessories which sold a quantity of **971** in total across the 3 branches.

| Product Line | Sum of Quantity |
|------------------------|-----------------|
| Electronic accessories | 971 |
| Food and beverages | 952 |
| Sports and travel | 920 |
| Home and lifestyle | 911 |
| Fashion accessories | 902 |
| Health and beauty | 854 |
| Grand Total | 5510 |

1.4 Which branch is the most profitable?



The most profitable branch is Branch C, which has a total gross income of **\$5,265.18**. It is also worth noting that Branch C has the highest total purchase amount among the three branches, totaling \$110,568.71.

| Branch | Sum of Total Purchase Price (\$) | Sum of Cost of Goods Sold (\$) | Sum of gross income (\$) |
|--------------------|----------------------------------|--------------------------------|--------------------------|
| A | 106200.37 | 101143.21 | 5057.16 |
| B | 106197.67 | 101140.64 | 5057.03 |
| C | 110568.71 | 105303.53 | 5265.18 |
| Grand Total | 322966.75 | 307587.38 | 15379.3 |

1.5 What are the peak sales hours and days of the week?

| PEAK SALES BY HOUR AND DAY | | | | | | | | | |
|-----------------------------|--|-----------------|----------|----------|----------|----------|----------|----------|------------------|
| Sum of Total Purchase Price | | Day of the Week | | | | | | | |
| Purchase Time | | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Grand Total (\$) |
| ⊕ 10 AM | | 4067.34 | 3738.42 | 4585.48 | 3177.33 | 6885.23 | 5671.69 | 3295.99 | 31421.48 |
| ⊕ 11 AM | | 4736.77 | 2872.63 | 5223.88 | 5004.96 | 4402.89 | 2649.29 | 5486.91 | 30377.33 |
| ⊕ 12 PM | | 4728.20 | 4726.10 | 3739.07 | 3238.33 | 2564.09 | 2159.24 | 4910.85 | 26065.88 |
| ⊕ 1 PM | | 5159.55 | 3758.63 | 3962.53 | 6734.34 | 2594.22 | 6824.31 | 5689.64 | 34723.23 |
| ⊕ 2 PM | | 4676.12 | 2004.35 | 4953.17 | 3212.57 | 5474.05 | 5166.27 | 5341.88 | 30828.40 |
| ⊕ 3 PM | | 2681.86 | 5141.35 | 7020.21 | 4855.94 | 4313.09 | 3696.06 | 3471.02 | 31179.51 |
| ⊕ 4 PM | | 2241.23 | 4690.99 | 3831.44 | 3229.62 | 4327.19 | 3092.34 | 3813.52 | 25226.32 |
| ⊕ 5 PM | | 4169.34 | 3179.26 | 2975.53 | 3101.27 | 4056.59 | 1893.41 | 5069.81 | 24445.22 |
| ⊕ 6 PM | | 3637.27 | 2806.09 | 2417.58 | 4233.77 | 3021.57 | 3175.29 | 6738.75 | 26030.34 |
| ⊕ 7 PM | | 5963.64 | 2598.62 | 9198.67 | 4160.17 | 3185.09 | 5475.93 | 9117.38 | 39699.51 |
| ⊕ 8 PM | | 2396.56 | 2382.63 | 3574.69 | 2782.84 | 4525.24 | 4122.50 | 3185.07 | 22969.53 |
| Grand Total (\$) | | 44457.89 | 37899.08 | 51482.25 | 43731.14 | 45349.25 | 43926.34 | 56120.81 | 322966.75 |

As per data, peak sales by hour happen around 7pm (7:00 – 7:49pm) and while by day, it occurs during Saturday.

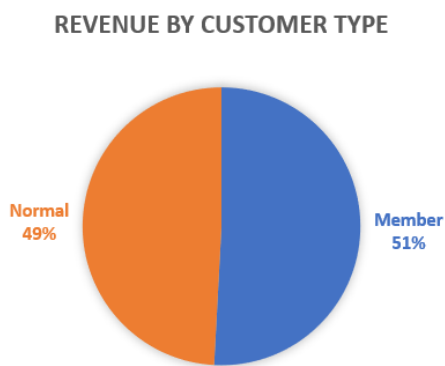
2. CUSTOMER BEHAVIOR ANALYSIS

2.1 Which gender spends more on average, and in which product line?

| GENDER SPENDING TRENDS BY PRODUCT LINE | | | | | | | |
|--|--|------------------------|---------------------|--------------------|-------------------|--------------------|-------------------|
| Sum of Total Purchase Price | | Column Labels | | | | | |
| Row Labels | | Electronic accessories | Fashion accessories | Food and beverages | Health and beauty | Home and lifestyle | Sports and travel |
| Female | | 27102.02 | 30437.40 | 33170.92 | 18560.99 | 30036.88 | 28574.72 |
| Male | | 27235.51 | 23868.50 | 22973.93 | 30632.75 | 23825.04 | 26548.11 |
| Grand Total (\$) | | 54337.53 | 54305.90 | 56144.84 | 49193.74 | 53861.91 | 55122.83 |

Female spends more on average than the male gender and the product line that they spent with the highest is Food and Beverages with a total amount of \$33,170.92.

2.2 Which customer type (Member vs. Normal) contributes more to total revenue?



The customer type that contributes more to total revenue is Member type of customers having purchased a total amount of \$164,223.44.

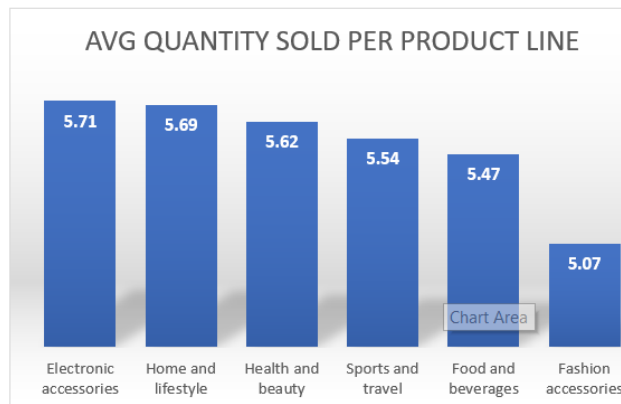
| REVENUE BY CUSTOMER TYPE | |
|--------------------------|---------------------------|
| Customer Type | Total Purchase Price (\$) |
| Member | 164223.44 |
| Normal | 158743.31 |
| Grand Total | 322966.75 |

2.3 Is there a difference in purchasing behavior across different cities?

| PURCHASING BEHAVIOR DIFFERENCES ACROSS CITIES | | | | |
|---|------------------|------------------|------------------|--------------------|
| City <input type="text"/> | | | | |
| Branch <input type="text"/> | Mandalay | Naypyitaw | Yangon | Total Revenue (\$) |
| A | | | 106200.37 | 106200.37 |
| B | 106197.67 | | | 106197.67 |
| C | | 110568.71 | | 110568.71 |
| Total Revenue (\$) | 106197.67 | 110568.71 | 106200.37 | 322966.75 |

There is not much difference among the three branches in terms of total revenue, however, it can also be noted that branch C which is located in Naypyitaw gathered the most amount in total revenue of \$110,568.71.

2.3 What is the average number of items per transaction for each product line?



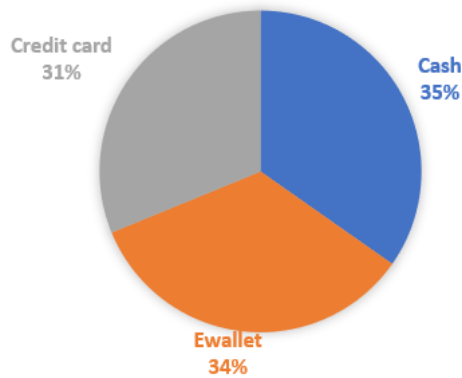
Electronics and accessories had the highest average number of items per transaction, resulting in an average quantity of 5.71, followed by Home and Lifestyle, Health and Beauty, Sports and Travel, Food and Beverages, and lastly, Fashion Accessories.

Overall, customers purchase approximately 5.51~6 items per transaction on average.

| AVG QUANTITY SOLD PER PRODUCT LINE | |
|------------------------------------|---------------------|
| Product Line <input type="text"/> | Average of Quantity |
| Electronic accessories | 5.71 |
| Home and lifestyle | 5.69 |
| Health and beauty | 5.62 |
| Sports and travel | 5.54 |
| Food and beverages | 5.47 |
| Fashion accessories | 5.07 |
| Grand Total | 5.51 |

2.4 How does customer spending vary by payment method?

SPENDING VARIATION BY PAYMENT METHOD

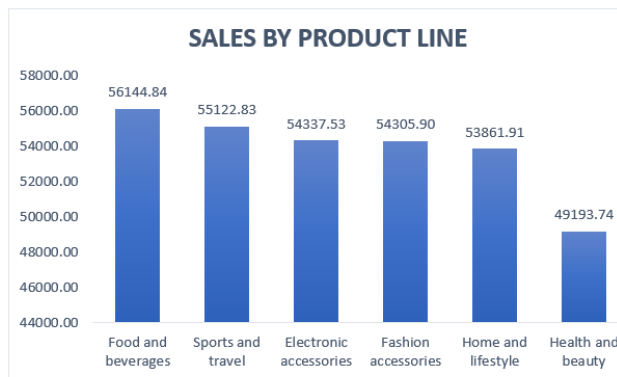


Paying by Cash comes first with a total amount of **\$112,206.57**, followed by Ewallet worthing **\$109,993.11** and lastly paying through credit card with **\$100,767.07**.

| CUSTOMER SPENDING VARIATION BY PAYMENT METHOD | |
|---|---------------------------|
| Payment Method | Total Purchase Price (\$) |
| Cash | 112206.57 |
| Ewallet | 109993.11 |
| Credit card | 100767.07 |
| Grand Total | 322966.75 |

3. PRODUCT & INVENTORY ANALYSIS

3.1 Which product lines have the highest and lowest sales?

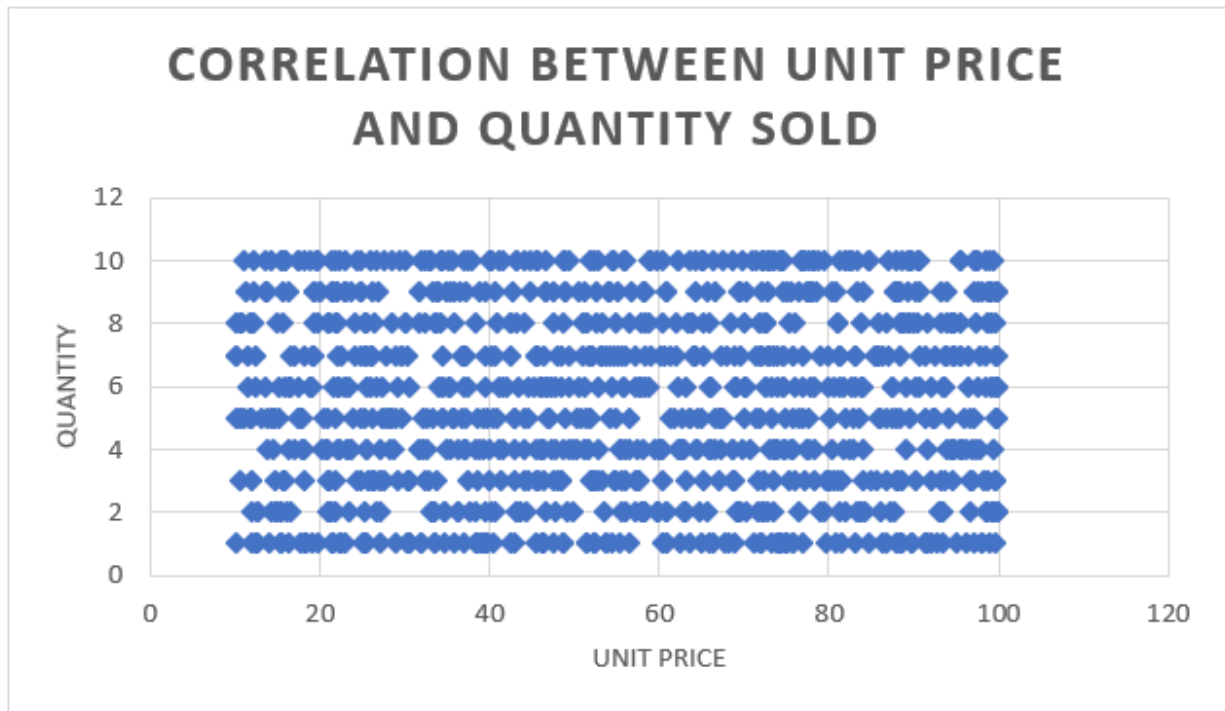


The product line that has the highest sales is Food and Beverages with **\$56,144.84** while the lowest is Health and Beauty with **\$49,193.74**.

| HIGHEST AND LOWEST SALES BY PRODUCT LINE | | |
|--|---------------------------|---------|
| Product Line | Total Purchase Price (\$) | |
| Food and beverages | 56144.84 | highest |
| Sports and travel | 55122.83 | |
| Electronic accessories | 54337.53 | |
| Fashion accessories | 54305.90 | |
| Home and lifestyle | 53861.91 | |
| Health and beauty | 49193.74 | lowest |
| Grand Total | 322966.75 | |

3.2 Is there a correlation between unit price and quantity sold?

CORRELATION 0.01078



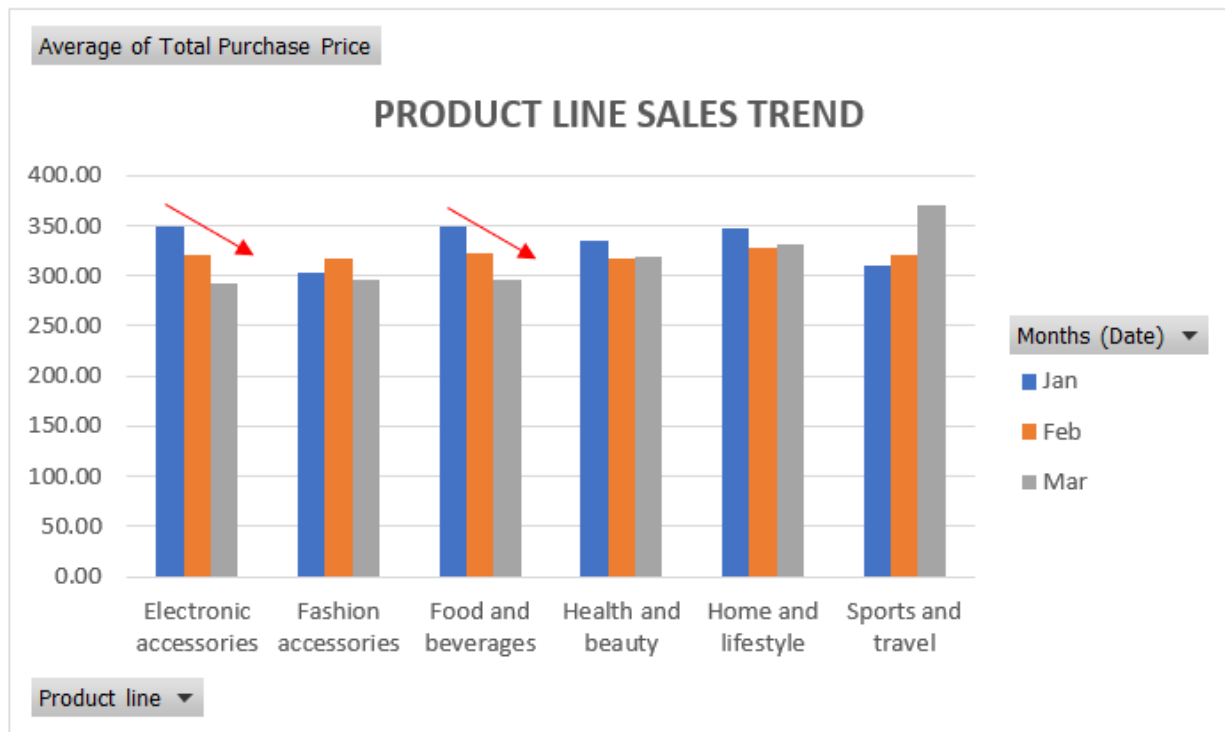
A correlation of 0.0108 indicates an *extremely weak positive correlation* between the two variables, in this case, *unit price* and *quantity sold*.

This means:

- There is *almost no relationship* between unit price and quantity sold, as the correlation is very close to 0.
- The tiny positive value suggests that, if anything, as unit price increases, quantity sold might increase very slightly, but this relationship is *almost negligible*.

In practical terms, this result suggests that unit price and quantity sold are virtually unrelated in this dataset.

3.3 Are some product lines consistently underperforming?

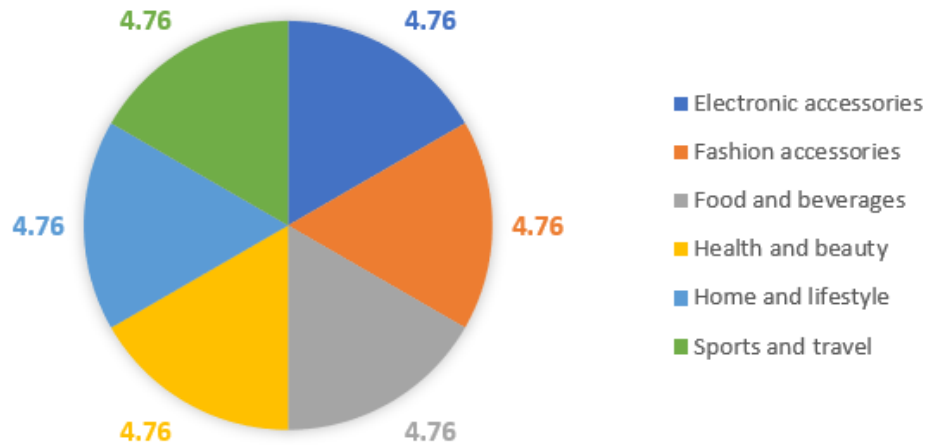


| Average of Total Purchase Price | Month ▼ | | | | |
|---------------------------------|---------------|---------------|---------------|--------------------|-----------|
| Product Line ▼ | Jan | Feb | Mar | Total Average (\$) | |
| Electronic accessories | 348.73 | 321.54 | 292.63 | 319.63 | declining |
| Fashion accessories | 302.27 | 316.83 | 295.39 | 305.09 | |
| Food and beverages | 349.47 | 322.59 | 295.96 | 322.67 | declining |
| Health and beauty | 334.35 | 317.44 | 319.44 | 323.64 | |
| Home and lifestyle | 347.37 | 327.22 | 332.27 | 336.64 | |
| Sports and travel | 309.53 | 321.15 | 370.68 | 332.07 | |
| Total Average (\$) | 330.37 | 320.86 | 317.26 | 322.97 | |

Based on the 3-month sales result from the dataset, it can be observed that product lines that are **declining** in sales performance are Electronics Accessories and Food and beverages. Both product lines have been declining over time.

3.4 Which product lines have the highest gross margin?

GROSS MARGIN PER PRODUCT LINE %



| GROSS MARGIN BY PRODUCT LINE | | |
|------------------------------|--|------------------------------|
| Product Line | Average of gross margin percentage (%) | Average of gross income (\$) |
| Electronic accessories | 4.76 | 15.22 |
| Fashion accessories | 4.76 | 14.53 |
| Food and beverages | 4.76 | 15.37 |
| Health and beauty | 4.76 | 15.41 |
| Home and lifestyle | 4.76 | 16.03 |
| Sports and travel | 4.76 | 15.81 |
| Grand Total | 4.76 | 15.38 |

*It can be noted that **all three branches use the same gross margin percentage of 4.76%** with **Home and Lifestyle** having the highest average gross income of \$16.03.*

4. PRICING & DISCOUNT ANALYSIS

4.1 How does the tax impact total sales and profitability?

| IMPACT OF TAX ON TOTAL SALES AND PROFITABILITY | | | |
|--|---------------|-----------------------------|---------------------|
| Row Labels | Sum of Tax 5% | Sum of Total Purchase Price | Sum of gross income |
| Electronic accessories | 2587.50 | 54337.53 | 2587.50 |
| Fashion accessories | 2586.00 | 54305.90 | 2586.00 |
| Food and beverages | 2673.56 | 56144.84 | 2673.56 |
| Health and beauty | 2342.56 | 49193.74 | 2342.56 |
| Home and lifestyle | 2564.85 | 53861.91 | 2564.85 |
| Sports and travel | 2624.90 | 55122.83 | 2624.90 |
| Grand Total | 15379.37 | 322966.75 | 15379.37 |

The store's pricing model is designed so that the 5% tax applied to each item also *represents the gross income per item*. This structure indicates that the store's profitability is entirely reliant on sales volume rather than expanding profit margins, as the tax essentially covers the entire profit margin.

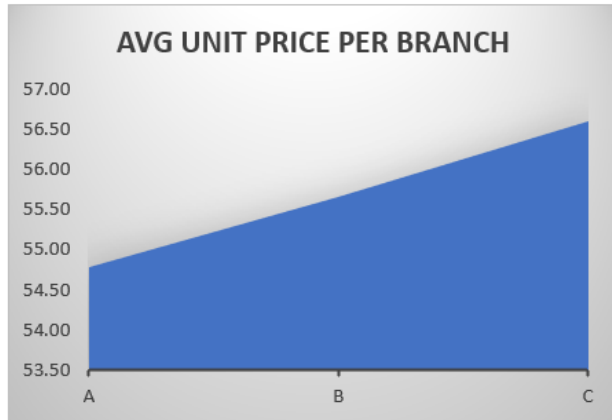
4.2 Do higher-priced products sell less compared to lower-priced ones?

CORRELATION 0.010777564



The correlation between product price and quantity sold is 0.0108, indicating a *negligible linear relationship*. This suggests that, based on the data analyzed, price does not significantly impact sales volume.

4.3 Which branch offers the highest average unit price?

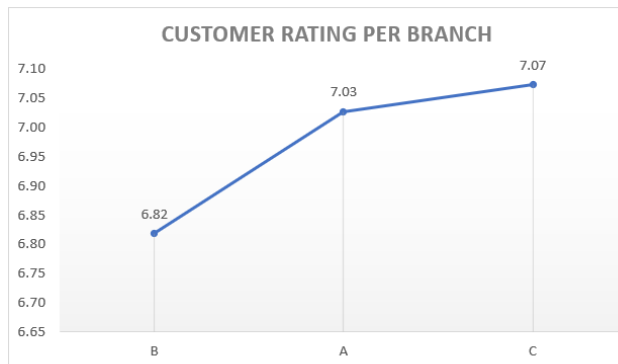


The branch that offers the highest average unit price is **Branch C** which has **\$56.61** per item.

| AVERAGE UNIT PRICE PER BRANCH | |
|-------------------------------|----------------------------|
| Branch ▾ | Average of Unit price (\$) |
| A | 54.78 |
| B | 55.66 |
| C | 56.61 |
| Grand Total | 55.67 |

5. CUSTOMER SATISFACTION (RATINGS ANALYSIS)

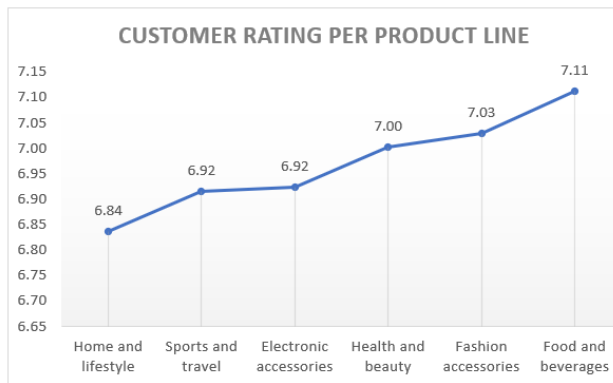
5.1 Which branch has the highest and lowest customer ratings?



The branch the has the **highest rating** is **Branch C**, while the **lowest** is **Branch B**.

| CUSTOMER RATING PER BRANCH | |
|----------------------------|-------------------|
| Branch ▾ | Average of Rating |
| B | 6.82 |
| A | 7.03 |
| C | 7.07 |
| Grand Total | 6.97 |

5.2 Which product line has the best and worst ratings?

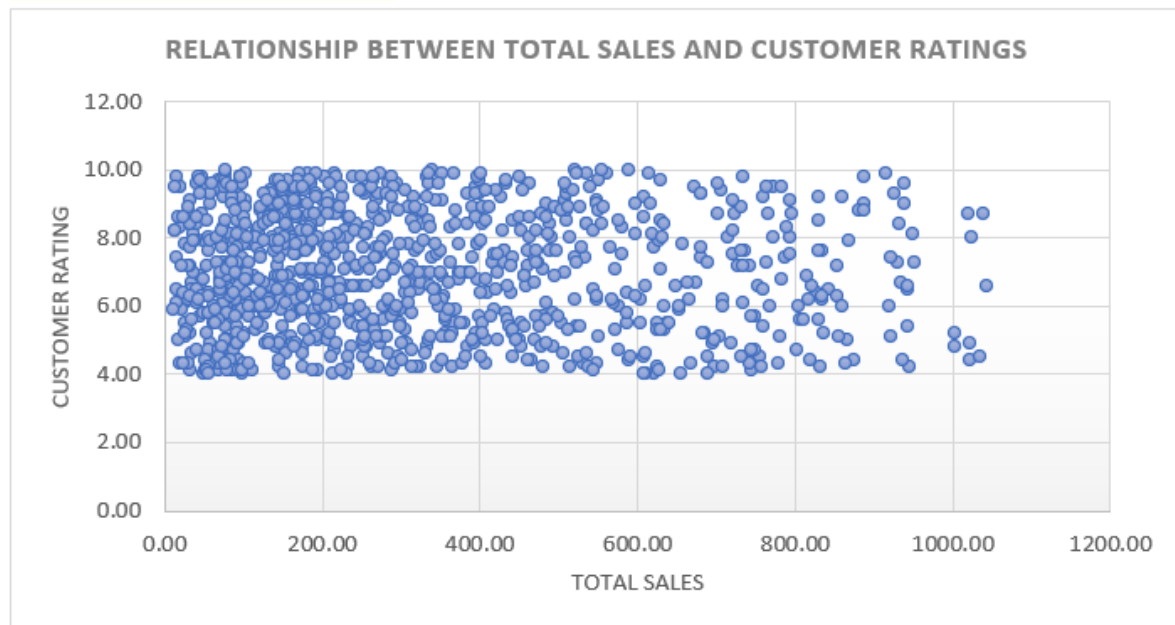


The product line that has the **best rating** is Food and Beverages having a rating of 7.11/10 while the **worst** is Home and Lifestyle with 6.84/10.

| CUSTOMER RATING PER PRODUCT LINE | | |
|----------------------------------|-------------------|--------------|
| Product Line | Average of Rating | |
| Home and lifestyle | 6.84 | worst rating |
| Sports and travel | 6.92 | |
| Electronic accessories | 6.92 | |
| Health and beauty | 7.00 | |
| Fashion accessories | 7.03 | |
| Food and beverages | 7.11 | best rating |
| Grand Total | 6.97 | |

5.3 Is there a relationship between total sales and customer ratings?

CORRELATION -0.036441705



The correlation between total sales and customer ratings is **-0.036**, indicating a very weak negative relationship. This suggests that there is little to no meaningful relationship between total sales and customer ratings in this dataset.

| RELATIONSHIP BETWEEN TOTAL SALES AND CUSTOMER RATINGS - REGRESSION ANALYSIS | | | | | | | | | |
|---|--------------|----------------|--------------|-------------|----------------|-------------|--------------|-------------|--|
| Regression Statistics | | | | | | | | | |
| Multiple R | 0.036441705 | | | | | | | | |
| R Square | 0.001327998 | | | | | | | | |
| Adjusted R Square | 0.000327325 | | | | | | | | |
| Standard Error | 1.718299005 | | | | | | | | |
| Observations | 1000 | | | | | | | | |
| ANOVA | | | | | | | | | |
| | df | SS | MS | F | Significance F | | | | |
| Regression | 1 | 3.91834363 | 3.91834363 | 1.327104259 | 0.24959691 | | | | |
| Residual | 998 | 2946.646366 | 2.952551469 | | | | | | |
| Total | 999 | 2950.56471 | | | | | | | |
| | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% | |
| Intercept | 7.054960946 | 0.089730264 | 78.6240965 | 0 | 6.878879314 | 7.231042578 | 6.878879314 | 7.231042578 | |
| X Variable 1 | -0.000254704 | 0.000221097 | -1.152000112 | 0.24959691 | -0.000688573 | 0.000179165 | -0.000688573 | 0.000179165 | |

The **R-squared** value is **0.0013**, indicating that the independent variable (**total sales**) explains only 0.13% of the variation in the dependent variable (**customer ratings**), which suggests a **very weak relationship between the two variables.**

The **coefficient** for total sales is **-0.00025**, suggesting that for every unit increase in total sales, customer ratings decrease slightly. However, the **p-value** for this coefficient is **0.25**, which is greater than the **0.05 threshold**, meaning that this relationship is **not statistically significant** and the result could be due to random chance.

In summary, based on these results, there is no meaningful or statistically significant relationship between total sales and customer ratings.

5.4 Do high-spending customers leave better ratings?

| Percentile | Values | Spending Type |
|------------------|-----------------|----------------|
| 33rd percentile | < 163.36 | Low Spender |
| 66th Percentile | 163.37 - 382.80 | Medium Spender |
| 100th percentile | > 382.80 | High Spender |

| IMPACT OF HIGH SPENDING ON CUSTOMER RATINGS | | | |
|---|-------------------|--------------------|--------------------------------------|
| Spending Type | Number of Spender | Rating Average | Average of Total Purchase Price (\$) |
| High Spender | 340 | 6.93 | 615.03 |
| Medium Spender | 330 | 7.06 | 256.46 |
| Low Spender | 330 | 6.93 | 88.56 |
| Grand Total | 1000 | 6.97 | 322.97 |
| | | CORRELATION | -0.196856012 |

The correlation between total spending and customer ratings is **-0.197**, indicating a weak negative relationship. This suggests that there is a slight inverse trend, where **higher spending may be weakly associated with lower ratings, although the relationship is not strong enough to draw definitive conclusions**

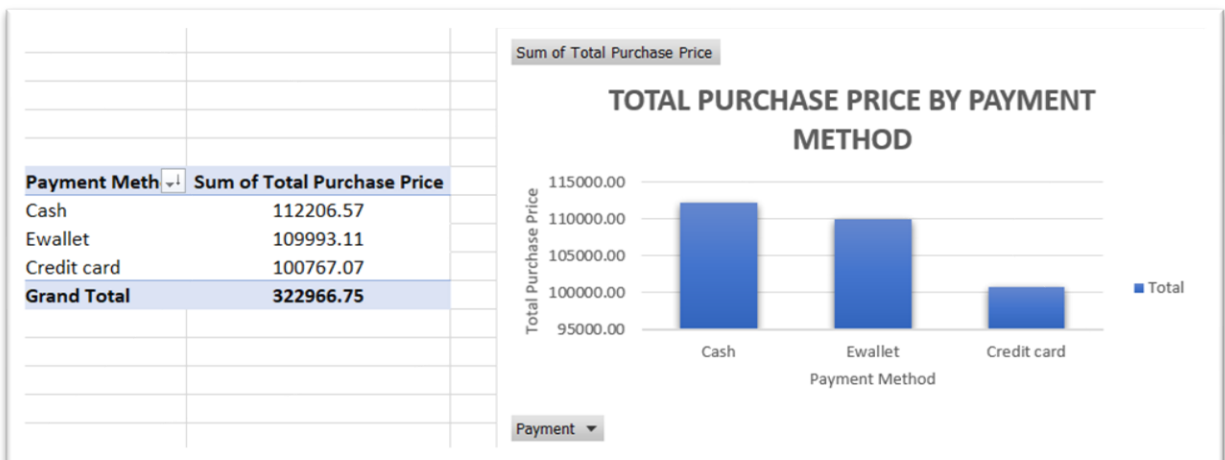
6. PAYMENT & TRANSACTION ANALYSIS

6.1 Which payment method is most commonly used?

| CUSTOMER'S PAYMENT METHOD | |
|---------------------------|--------------------|
| Payment Method | Number of Customer |
| Ewallet | 345 |
| Cash | 344 |
| Credit card | 311 |
| Grand Total | 1000 |

The most commonly used payment method is the Ewallet, which has 345 customers.

6.2 Are there differences in spending based on the payment method? Do customers using a specific payment method buy more expensive products?

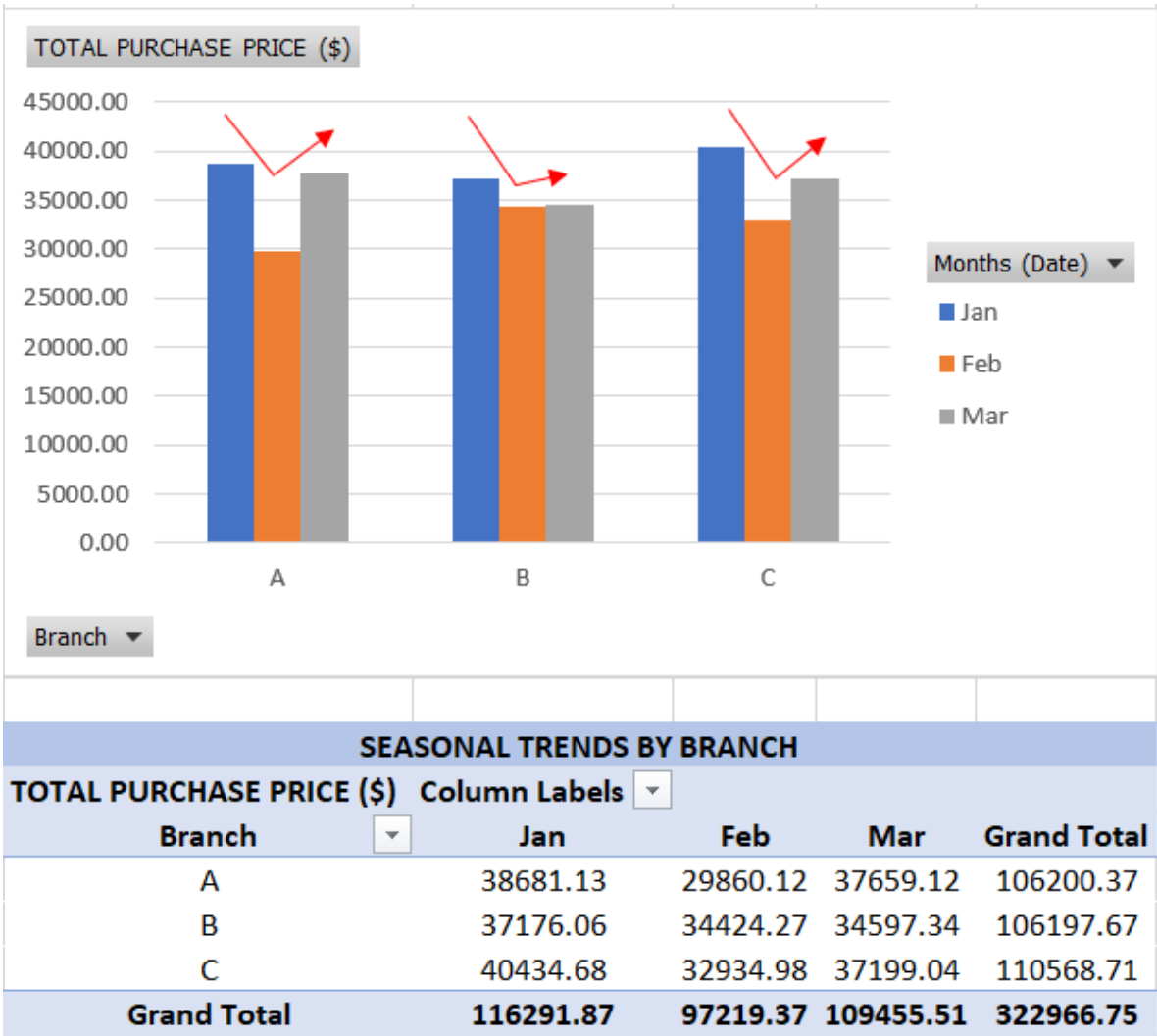


| CUSTOMER'S PAYMENT METHOD | | |
|---------------------------|--------------------|-----------------------------|
| Payment Meth | Number of Customer | Sum of Total Purchase Price |
| Ewallet | 345 | 109993.11 |
| Cash | 344 | 112206.57 |
| Credit card | 311 | 100767.07 |
| Grand Total | 1000 | 322966.75 |
| CORRELATION | | 0.97818108 |

The correlation between payment method and total purchase price is **0.978**, indicating a very strong positive relationship. This suggests that a customer's total purchase price is closely linked to the payment method they choose. Specifically, customers using **Cash** are expected to have the **highest total purchase price**, followed by those using **Ewallet**, with **Credit card** users generally making the lowest total purchases.

7. TREND & TIME-BASED ANALYSIS

7.1 Are there seasonal trends in supermarket sales by branch?



Overview

Based on the sales data from January to March, there is a clear seasonal trend across all branches. January recorded strong sales, but February experienced a significant decline, followed by a recovery in March.

Key Findings

- **January Sales:** Sales were at their highest, indicating strong consumer demand at the beginning of the year.
- **February Dip:** There was a noticeable drop in sales across all branches, suggesting a potential seasonal slowdown.
- **March Recovery:** Sales increased again, indicating a return of consumer demand.

Recommendations

To mitigate the sales decline in February, the following strategies can be implemented:

1. **Promotional Campaigns:** *Introduce discounts, bundled offers, or loyalty rewards to attract more customers.*
2. **Seasonal Marketing Strategies:** *Align promotions with events such as Valentine's Day or other seasonal trends.*
3. **Product Mix Optimization:** *Identify high-performing products from January and March and promote them more in February.*
4. **Customer Engagement:** *Enhance marketing efforts through targeted ads, email promotions, and in-store activations.*

By implementing these strategies, we can work towards minimizing the sales dip in February and ensuring a more stable revenue flow throughout the first quarter.

7.2 Is revenue increasing or decreasing over time?

Revenue Trend Analysis (January - March)

*From the recorded sales data, **January had the highest revenue**, but there was a **notable decline in February** across all branches. However, in **March, sales rebounded**, indicating a recovery.*

- **January → February:** *Revenue **decreased** significantly.*
- **February → March:** *Revenue **increased** again.*

*Since the data covers only **three months**, it is difficult to determine a **long-term trend**. However, the short-term pattern suggests **fluctuations rather than a consistent increase or decrease**. To establish a clearer trend, it would be beneficial to analyze sales over a longer period, ideally a year or more.*

SUMMARY OF FINDINGS

1. SALES & REVENUE INSIGHTS

- *The total revenue across the three branches is \$322,966.75, with Branch C generating the highest sales at \$110,568.71. There isn't much variation in total revenue among the branches. The Food and Beverages product line leads in revenue, bringing in \$56,144.83, while Electronics Accessories is the top-selling product by quantity, with 971 units sold across all branches. Peak sales occur around 7:00–7:49 PM, and Saturdays see the highest sales by day.*

2. CUSTOMER BEHAVIOR ANALYSIS

- *Females tend to spend more on average than males, with their highest expenditure on the Food and Beverages product line, totaling \$33,170.92. Member-type customers contribute significantly to total revenue, having spent \$164,223.44 in total. On average, customers purchase around 5.51~6 items per transaction. Cash payments lead with \$112,206.57, followed by Ewallets at \$109,993.11, and credit card payments at \$100,767.07.*

3. PRODUCT & INVENTORY ANALYSIS

- *Food and Beverages leads sales at \$56,144.84, while Health and Beauty trails at \$49,193.74. The correlation of 0.0108 shows a very weak link between unit price and quantity sold. Over the last three months, Electronics Accessories and Food and Beverages have declined in sales. All three branches share a 4.76% gross margin, with Home and Lifestyle achieving the highest average gross income of \$16.03.*

4. PRICING & DISCOUNT ANALYSIS

- *The store's profitability depends mainly on sales volume, as taxes cover most of the profit margin. The correlation between product price and quantity sold is 0.0108, indicating a negligible relationship, suggesting that price doesn't significantly impact sales volume. Branch C offers the highest average unit price at \$56.61 per item.*

5. CUSTOMER SATISFACTION (RATINGS ANALYSIS)

- *Branch C leads in ratings, while Branch B ranks lowest. Food and Beverages scores the highest with 7.11/10, and Home and Lifestyle the lowest at 6.84/10. The weak negative correlations between total sales (-0.036) and spending (-0.197) with customer ratings suggest no strong connection, though a slight inverse trend is observed with higher spending.*

6. PAYMENT & TRANSACTION ANALYSIS

- *The Ewallet is the most commonly used payment method, with 345 customers. The strong correlation of 0.978 between payment method and total purchase price shows that payment method is closely linked to purchase amounts. Cash users typically have the highest total purchases, followed by Ewallet users, while credit card users make the lowest purchases.*

7. TREND & TIME-BASED ANALYSIS

- *The sales data from January to March shows a seasonal trend, with strong sales in January, a decline in February, and a recovery in March. The short-term pattern indicates fluctuations, making it difficult to identify a long-term trend. Analyzing sales over a longer period would provide a clearer picture.*

RECOMMENDATION

To sustain revenue and improve profitability, the business should:

1. Monitor product trends more closely, particularly the decline in Electronics Accessories and Food and Beverages, and adjust marketing or bundling strategies accordingly.
2. Capitalize on peak hours (7:00–7:49 PM) and weekends, optimizing staffing, inventory, and promotions during these periods.
3. Segment marketing efforts by gender and membership status, since female customers and members contribute more significantly to revenue.
4. Investigate product performance beyond price, as pricing appears to have minimal impact on sales volume; instead, focus on product placement, bundling, or loyalty perks.
5. Improve satisfaction for underperforming categories like Home and Lifestyle by gathering direct feedback and enhancing the product experience.
6. Extend sales tracking beyond the current 3-month window to detect long-term trends and forecast seasonal performance with greater accuracy.

REFLECTION & NEXT STEPS

- This project improved my ability to analyze retail data in Excel and draw insights from customer behavior, sales patterns, and product trends. Next, I plan to extend the dataset and explore advanced Excel tools like pivot charts and forecasting for deeper analysis.