

# Vending Machine Sales Report

## Introduction

This report presents the analysis of sales data from vending machines across diverse locations in Central New Jersey, encompassing a library, a mall, an office setting and a manufacturing facility. The dataset serves as a valuable resource for analysing consumer behaviour and vending machine performance in various environments. The locations and machine data are as follows:

1. Gutten Plans: A frozen dough specialist company that operates 24 hours a day, 5 days a week. Vending machine: GuttenPlans x1367.
2. EB Public Library: A public library boasting high foot traffic over 5 - 6 days a week. Vending machine: EB Public Library x1380.
3. Brunswick Sq Mall: This mall experiences average foot traffic over all 7 days of the week. Vending machine(s): BSQ Mall x1364 - Zales and BSQ Mall x1366 - ATT.
4. Earle Asphalt: A construction engineering firm in operation 5 days a week. Vending machine: Earle Asphalt x1371.

By exploring this data, I aim to uncover insights into purchasing trends, product popularity, and potential opportunities for optimization within each location.

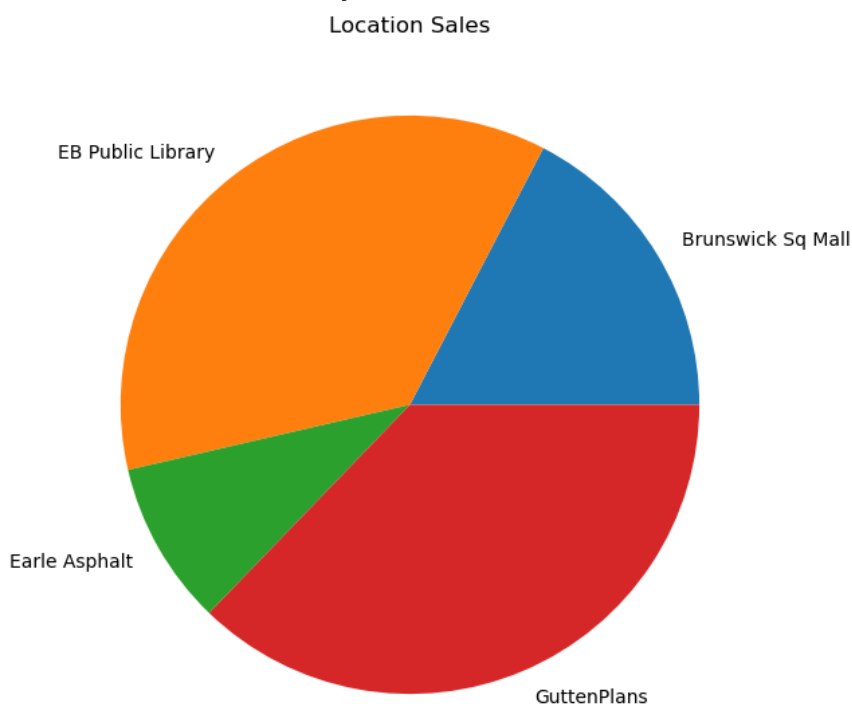
## Data Cleaning

After identifying and addressing missing values, only six rows with null data remained, all related to the EB Public Library x1380 machine. Due to their limited number, I decided to drop these entries to maintain data integrity. Additionally, I conducted a check for duplicates, but found none. While exploring for outliers using z-scores, I opted not to remove any rows, deeming them all relevant to the dataset.

Finally, I optimized the dates columns by converting dates to DateTime data type.

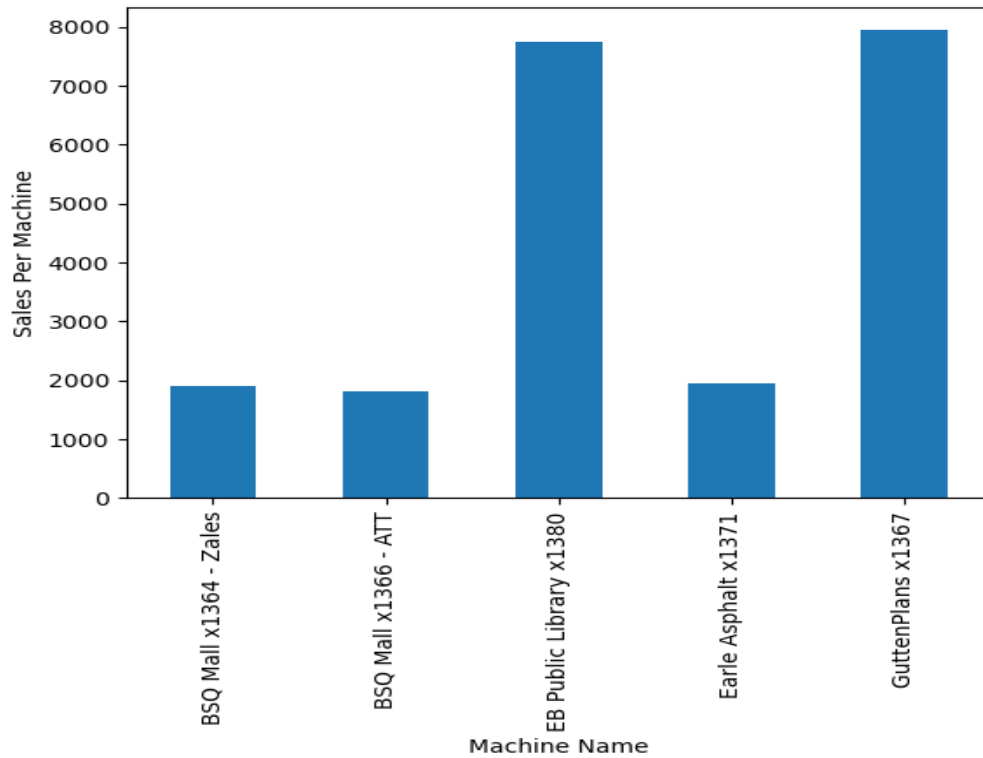
## Exploratory Data Analysis

### Location-Based Sales Analysis



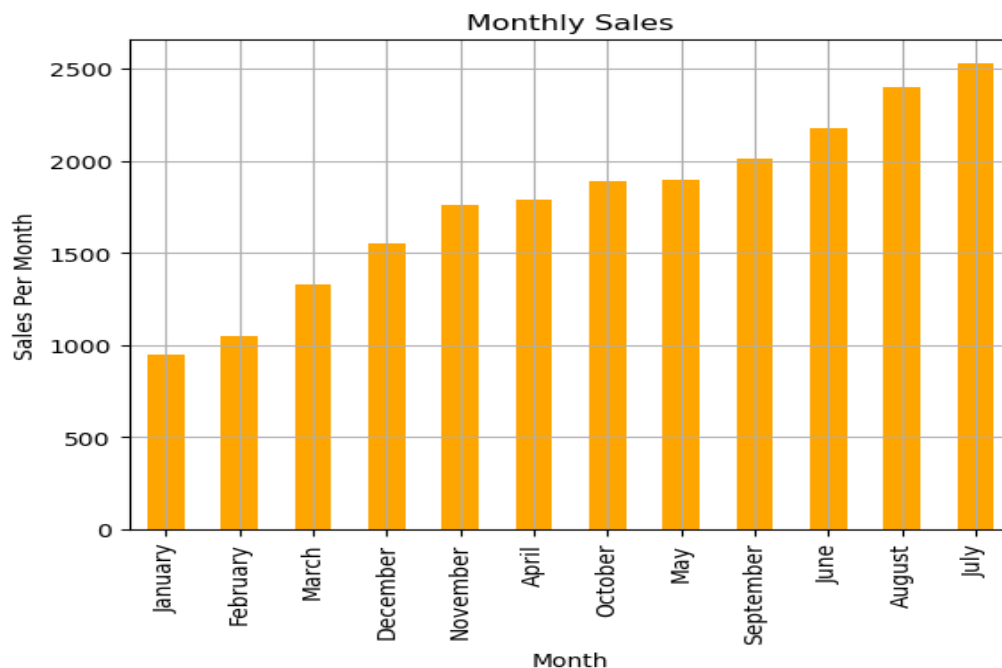
- GuttenPlans and EB Public Library have the highest sales while Earle Asphalt has the lowest.
- Inventory management should be tailored to the unique characteristics of each location to prevent stockouts while minimizing excess inventory that may lead to waste.
- Promo and Discount sales could be considered to improve sales at Brunswick Square Mall and Earle Asphalt.

## Machine-Specific Sales Analysis



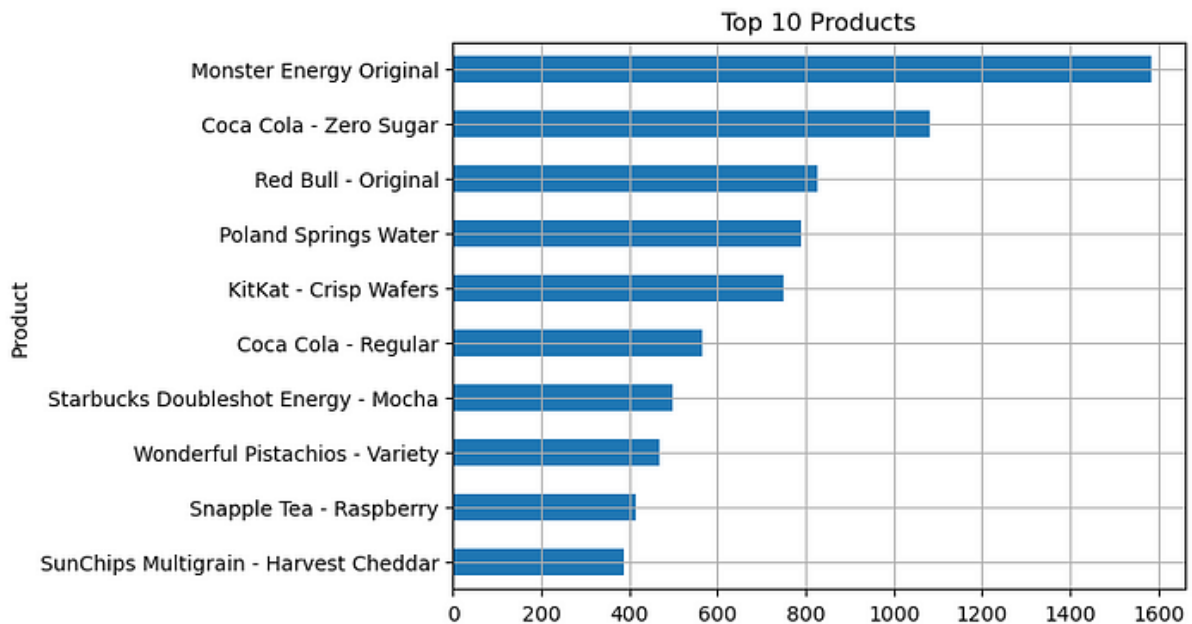
- This analysis highlights the sales performance of each vending machine, with GutttenPlans x1367 and EBPublic Library x1380 leading in sales, while the machines at BSQ Mall and Earle Asphalt have comparatively lower sales figures.
- Resources and attention should be allocated to machines that demonstrate high sales performance, such as GutttenPlans x1367 and EBPublic Library x138. These machines may benefit from additional product offerings, promotional activities, or enhanced maintenance to sustain or further increase sales.
- It is important to investigate factors contributing to lower sales at machines like BSQ Mall x1364, BSQ Mall x1366 and Earle Aphalt x1371. This could involve assessing pricing strategies, machine visibility, or overall customer experience to identify areas for improvement.
- Investors could be more interested in the top locations and machines — GutttenPlans and EB Public Library.

## Monthly Sales Analysis



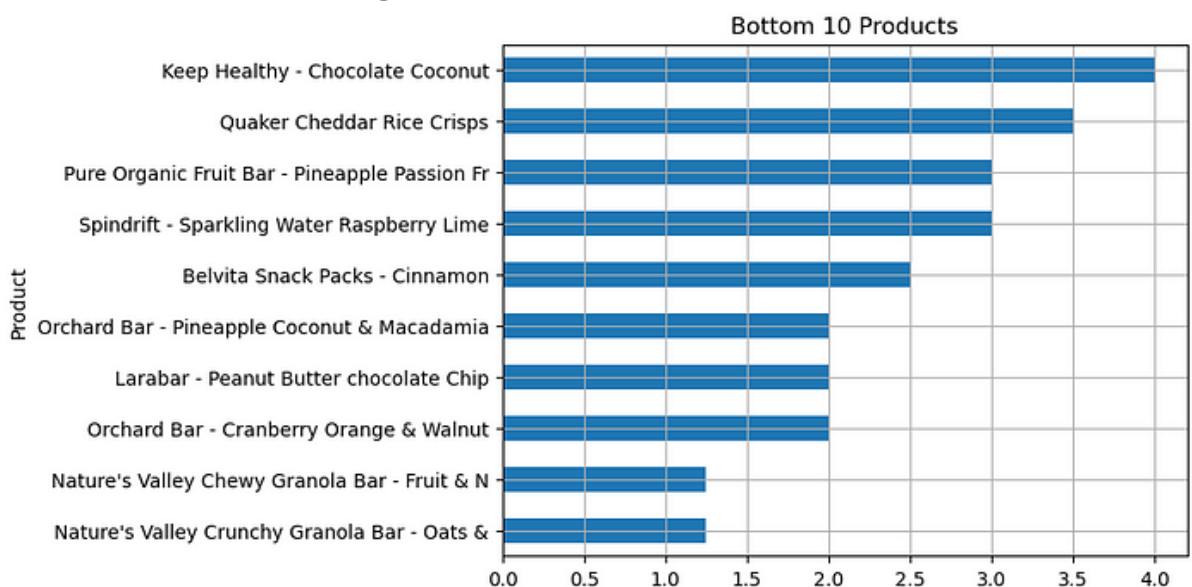
- The highest sales were recorded in the summer, with July being the peak month.
- This shows that business thrive best in Summer.
- The lowest monthly sales were recorded in winter.
- The seasonal fluctuation in sales should inform proper planning and allocation of resources as well as the need to prioritise marketing efforts during the peak season.

## Top 10 Product Insights



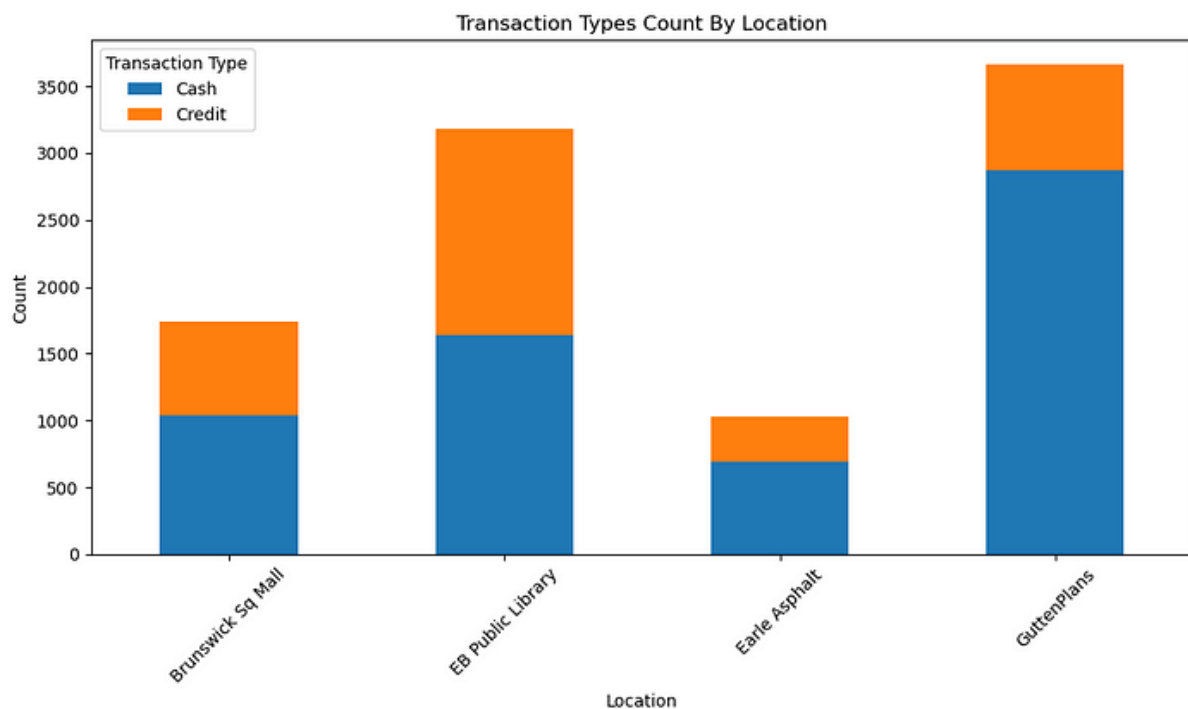
- Monster Energy Original is the most preferred product, followed by Coca-Cola Zero Sugar.
- This analysis offers insight into consumer preferences, market trends, and potential areas for growth.

## Bottom 10 Product Insights



- Nature's Valley Crunchy Granola Bar appears to be the product with the lowest sales.
- It is important to gain insight into areas needing improvement, potential reasons for underperformance, and opportunities for optimization.
- This should inform decisions on product redesign, marketing efforts, or even discontinuation to allocate resources more effectively and enhance overall business performance.

## Analysis of Transaction Type By Location



- In Brunswick Sq Mall, there were 1036 cash transactions and 703 credit. \*People paying with cash are relatively more than those with credit.
- EB Public Library had 1538 credit transactions and 1639 cash. \*There is no major difference between the two transaction types.
- 693 cash transactions were recorded as against 341 credit transactions in Earle Asphalt. \*Most customers prefer cash payments over credit transactions.
- GutterPlans had 2871 cash and 790 credit transactions. \*A significant number of people preferred cash transactions.
- Overall, customers prefer cash payments over credit transactions, as evidenced by the higher number of cash transactions
- It is important to do further analysis to explore the demographics of the customers in each location to understand why cash transactions are more prevalent.
- The various locations (especially, GutterPlans) may need to ensure they have adequate cash-handling procedures in place to manage the high volume of cash transactions effectively. Additionally, they could evaluate their credit payment options to encourage more customers to use credit, potentially increasing sales or reducing the need for cash handling.
- Marketing strategies could be tailored to promote credit payment options or introduce incentives for customers to use credit, such as discount or loyalty rewards.

This analysis provides valuable insights that can inform various aspects of the business from operations and marketing to financial management and customer service.