Coffee Shop Sales Data Analysis Report

Introduction

This report provides an analysis of the sales data of a coffee shop, exploring various aspects of the business, including revenue, sales patterns, and customer behavior. The analysis is based on a dataset containing information on coffee sales, including the type of coffee, date, time, and payment method.

Data Preprocessing

The analysis begins with importing the necessary libraries, including NumPy, Pandas, Matplotlib, and Seaborn. The dataset is then loaded into a Pandas dataframe, and the first few rows are displayed to ensure the data is correctly formatted.

The data is then cleaned and preprocessed by:

- Checking for missing values and duplicates

- Converting the date and time columns to datetime format

- Extracting the month, day, and hour from the date and time columns

- Creating new columns for the month, day, and hour

Exploratory Data Analysis

The analysis then proceeds to explore the data, including:

- Plotting a histogram of the cash type (payment method) to understand the distribution of payment methods

- Calculating the value counts of the coffee names to identify the most popular coffee types

- Plotting a bar chart of the coffee names to visualize the popularity of each coffee type

- Calculating the revenue for each coffee type and plotting a bar chart to visualize the revenue distribution

Sales Patterns

The analysis then examines the sales patterns, including:

- Plotting a histogram of the sales data to understand the distribution of sales

- Grouping the sales data by day of the week and plotting a bar chart to visualize the sales patterns by day

- Grouping the sales data by month and plotting a line chart to visualize the sales patterns over time

- Calculating the daily sales for each coffee type and plotting a line chart to visualize the daily sales patterns

Hourly Sales

The analysis then examines the hourly sales patterns, including:

- Grouping the sales data by hour and plotting a bar chart to visualize the hourly sales patterns

- Calculating the hourly sales for each coffee type and plotting a bar chart to visualize the hourly sales patterns for each coffee type

Conclusion

This analysis provides insights into the sales patterns and customer behavior of the coffee shop. The results show that the most popular coffee types are Americano, Americano with Milk, and **Cappuccino**, and that the sales patterns vary by day of the week and hour of the day. The analysis also reveals that the revenue distribution is skewed towards the top-selling coffee types. These insights can be used to inform business decisions, such as inventory management, pricing strategies, and marketing campaigns.

Recommendations

Based on the analysis, the following recommendations are made:

- Increase inventory of top-selling coffee types to meet demand

- Implement pricing strategies to optimize revenue

- Develop marketing campaigns to promote top-selling coffee types and increase sales during peak hours

- Consider offering promotions or discounts during off-peak hours to increase sales

Note: The specific recommendations will depend on the actual results of the analysis and the business goals of the coffee shop.