

Ice Cream Company Report

You are a data analyst working for an ice cream company. Management is interested in improving the company's ice cream sales.

The company has been collecting sales data, but not much. The available data is from an internal data source and is based on sales for 2019. You've been asked to review the data and provide some insight into the company's ice cream sales. Ideally, management would like answers to the following questions:

1. What is the most popular ice cream flavour?
2. How does temperature affect sales?
3. How do weekends and holidays affect sales?
4. How does profitability differ for new versus returning customers?

Analysis

1. What is the most popular Ice cream flavour?

Objective: To identify the most popular ice cream flavour for the 2019 fiscal year.

Methodology & Definition: For the purposes of this analysis, "popularity" is defined by the **total volume of units sold**. Due to the absence of pricing or revenue data in the current dataset, popularity cannot be measured by total sales value (revenue) at this time.

Findings: The total units sold per flavour are as follows:

- **Chocolate:** 460
- **Lemon:** 713
- **Strawberry:** 399
- **Vanilla:** 527

The most popular flavour is **Lemon**, with a total of **713** units sold in 2019.

Data Limitations & Recommendations:

Lack of Financial Context: The dataset lacks a "Price per Unit" or "Total Revenue" column. Therefore, while **Lemon** moved the most volume, it is unknown if it was the most profitable flavour.

Stakeholder Action: It is recommended to consult with stakeholders to acquire annual sales (revenue) data from an alternate source. This would allow for a more robust analysis of "popularity" by comparing volume against profit margins

2. How does temperature affect sales

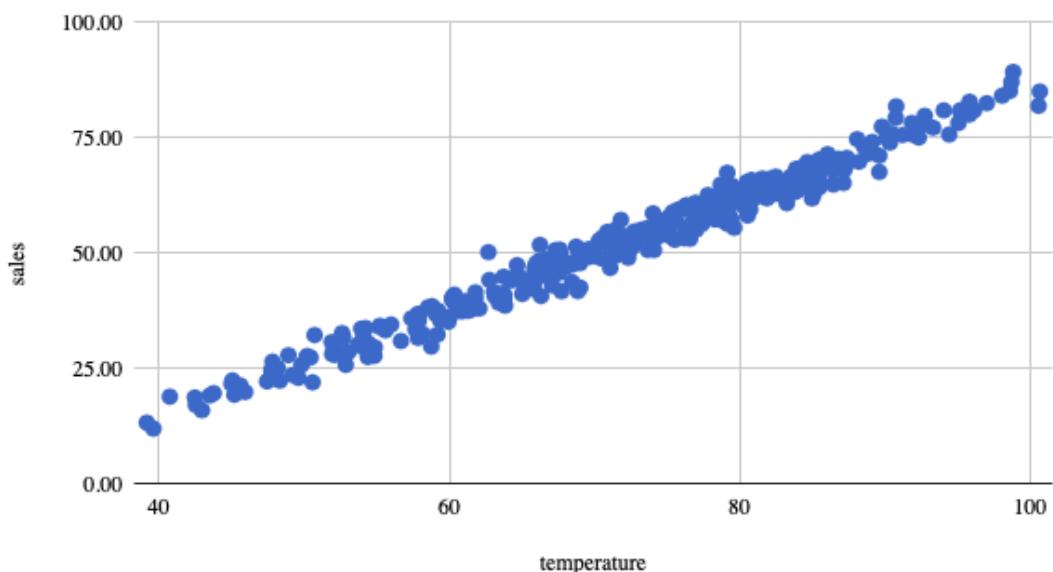
Overview:

To determine how external factors influence business performance, an analysis was conducted on the temperatures dataset, which contains 365 rows of daily temperature and sales figures for the year 2019.

Findings:

Positive Correlation: The scatter plot analysis reveals a strong **positive correlation** between daily high temperatures and ice cream sales. As the temperature increases, sales figures trend upward in a linear fashion.

sales vs temperature



Because there are 365 entries with varying sales values for the same temperatures, the data is interpreted as daily snapshots rather than a summary of multiple days.

Based on the visual trend:

When daily highs are above **80 degrees**, average ice cream sales consistently exceed **\$60.00**. Consequently, the business should plan on increasing inventory and staffing during these high-temperature periods to maximize sales potential.

Data Integrity & Transparency:

In accordance with standard data analysis practices, the following limitations were identified:

- **Chronological Uncertainty:** It is unknown if the data is listed in consecutive order by date. Without specific dates, we cannot account for holiday or weekend spikes that may overlap with high temperatures.
- **Further Action:** A request should be made to the dataset owner to clarify the chronological order of the entries to allow for a more precise time-series analysis.

3. How do weekends affect sales?

Objective:

To determine if sales on weekends are greater than on weekdays to assist with inventory and marketing planning.

Findings:

After categorizing the 365 daily entries for 2019, the average sales were compared:

- **Average Weekday Sales:** \$104.19
- **Average Weekend Sales:** \$105.69

There is a slight increase in sales during the weekend, with an average growth of **\$1.50 per day** compared to weekdays.

Business Application & Insights

- **Inventory Management:** While the increase is modest, the consistent upward trend on weekends suggests that the business should ensure peak inventory levels are reached by Friday afternoon to avoid potential stockouts.
- **Marketing Strategy:** Since sales remain steady throughout the week but peak slightly on weekends, marketing efforts or "weekend specials" could be used to further capitalize on this existing consumer behavior.

4. How does profitability differ for new customers versus returning customers?

Objective

To determine how profitability differs between new and returning customers to better target marketing campaigns and increase brand loyalty.

Findings & Data Constraints:

- **Data Availability:** Upon inspection, the current dataset contains comprehensive sales, flavour, and temperature figures but **does not include customer-specific data**.
- **Current Limitation:** Without unique customer identifiers or transaction history linked to specific individuals, it is currently impossible to categorize sales as "New" versus "Returning".

Proposed Next Steps:

To answer all the questions from management, the following actions are recommended:

1. **Data Integration:** Coordinate with stakeholders to access the company's primary customer database.
2. **Table Join:** Perform a data join between the existing revenue sales table and the customer database.
3. **Categorization:** Tag each transaction based on customer history to analyze the variance in average spend and profitability between the two groups.

Business Value:

Completing this "missing link" in the data will allow the business to develop precision marketing campaigns. For example, if returning customers are found to be 20% more profitable, resources can be shifted toward loyalty programs rather than just broad acquisition.

Summary of your complete project

1. **flavours:** Identified popularity by units sold.
 2. **Temperature:** Proved a strong positive correlation between heat and revenue.
 3. **Weekends:** Showed that average sales increase on weekends (\$105.69) compared to weekdays (\$104.19).
 4. **Customer Insights:** Identified the need for more granular data to track brand loyalty.
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