Group Members: Andrea Aceves, Joshua Arias, Andrew Mao, Jonathan De La Torre

Customer Loyalty Analysis for Baskin-Robbins

This report examines the factors influencing customer loyalty to Baskin-Robbins, one of the leading brands in the ice cream industry. With increasing competition in the market, Baskin-Robbins faces the challenge of retaining its loyal customers while appealing to new ones. Through this project, we sought to uncover the key drivers behind customer satisfaction and loyalty, focusing on aspects such as product variety, seasonal offerings, and overall quality. The findings aim to provide actionable insights for Baskin-Robbins and similar businesses in their efforts to strengthen customer retention strategies.

Introduction

The primary research question guiding this study was: *What factors influence consumer loyalty to Baskin-Robbins in a competitive ice cream market?* This question is rooted in the competitive nature of the ice cream industry, where brands must constantly innovate and adapt to retain customers. Baskin-Robbins, with its unique product offerings and brand equity, provides an interesting case study. While existing literature extensively discusses general customer satisfaction and brand loyalty, there is a gap in understanding how these dynamics operate within the specific context of Baskin-Robbins. By addressing this gap, we hope to offer insights that can help the brand build stronger relationships with its customers.

Background

Customer loyalty theories suggest that repeat purchases are primarily driven by satisfaction and emotional connections to a brand. Similarly, brand equity theory emphasizes the importance of a strong brand identity and perceived value in fostering loyalty. However, there is limited research on how these factors specifically affect Baskin-Robbins. This project aimed to fill this gap by exploring how product quality, variety, and limited-time seasonal flavors contribute to customer satisfaction and retention.

Hypotheses

Our study was guided by two hypotheses:

1. Higher frequency of limited-time or seasonal flavors positively impacts customer loyalty.
2. Customer satisfaction with product quality and variety is a key driver of repeat business.

Data Collection

To test these hypotheses, we conducted a survey of 71 Baskin-Robbins customers. The survey included a mix of quantitative questions using a Likert scale and open-ended questions to gather both numerical data and qualitative insights.

The respondents were primarily in the 25–34 age group, with most reporting that they visit Baskin-Robbins less than once a month. The survey revealed high satisfaction with product quality and flavor variety, although the influence of limited-time or seasonal flavors on visit frequency was rated as slight to moderate. Open-ended responses highlighted several aspects customers appreciated, such as the quality of ice cream, convenience, and nostalgic appeal. Customers also provided suggestions for improvement, including online ordering options, unique toppings, and the addition of frozen yogurt to the menu.

Data Analysis

Regression analysis was used to determine the relationship between various factors and the likelihood of customers returning to Baskin-Robbins. The results showed that satisfaction with product quality was a significant predictor of return likelihood, with a statistically significant result ($p < 0.001$) and an explanatory power of 18.1% (R2R^2R2 = 0.181). However, satisfaction with flavor variety was not a significant predictor ($p = 0.208$). Additionally, the interaction between product quality and variety did not improve the model significantly ($p = 0.804$).

A chi-square analysis was conducted to examine the relationship between visit frequency and the influence of seasonal flavors. The results indicated no statistically significant association ($\chi2\chi^2\chi2 = 8.496$, $p = 0.387$), suggesting that seasonal flavors, while appreciated, do not directly impact visit frequency or customer loyalty.

Conclusions

The findings partially supported our hypotheses. While the first hypothesis was rejected—seasonal flavors did not significantly impact customer loyalty—the second hypothesis was partially confirmed. Satisfaction with product quality emerged as a key driver of repeat business, whereas satisfaction with flavor variety played a less crucial role.

Recommendations

Based on the results, we recommend that Baskin-Robbins prioritize efforts to improve product quality. This could include refining the taste, texture, and consistency of their ice creams, as these factors significantly influence customer loyalty. While seasonal flavors should continue to

be offered as a way to create buzz and attract interest, their frequency and variety should not take precedence over the quality of core products.

Additionally, Baskin-Robbins should consider customer feedback to enhance its offerings. For instance, expanding online ordering options and introducing unique toppings or frozen yogurt could address unmet customer needs and attract a broader audience.

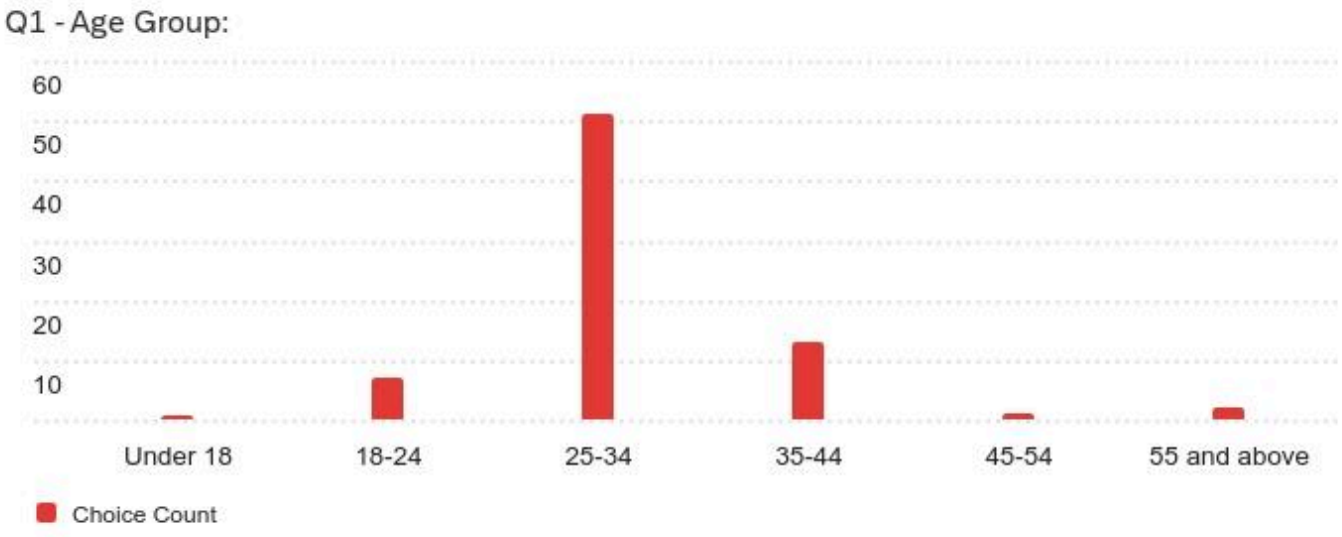
Final Thoughts

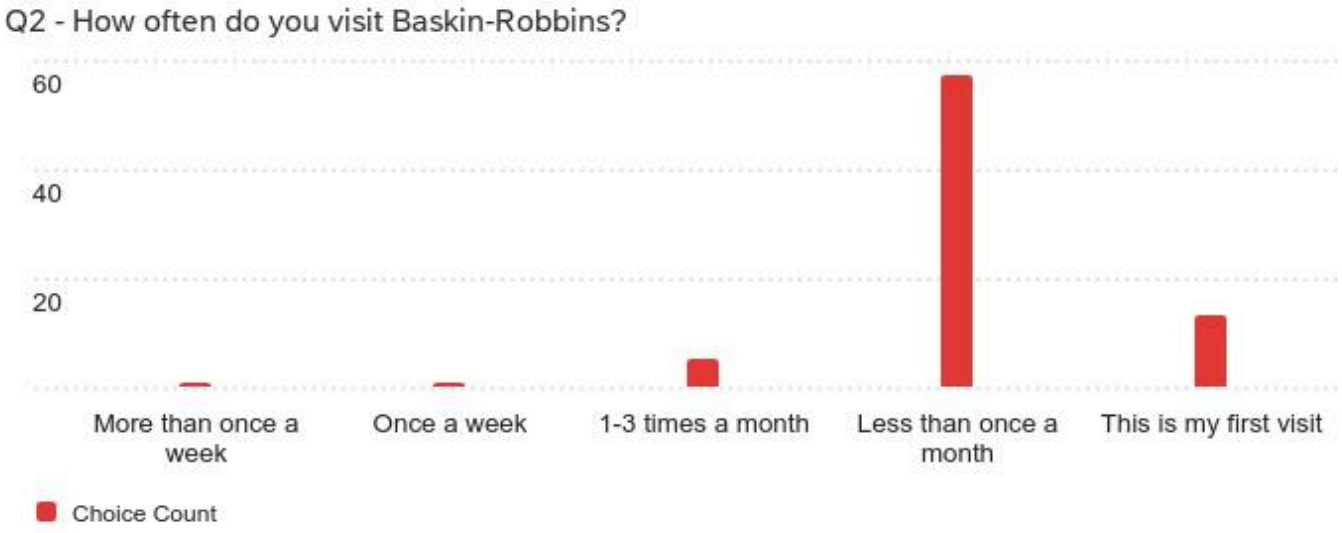
In conclusion, this study highlights the importance of product quality in fostering customer loyalty at Baskin-Robbins. While promotional offerings like seasonal flavors add value, they should not overshadow the fundamental aspects of product satisfaction. By focusing on these insights, Baskin-Robbins can strengthen its position in the competitive ice cream market and build lasting relationships with its customers.

Appendix

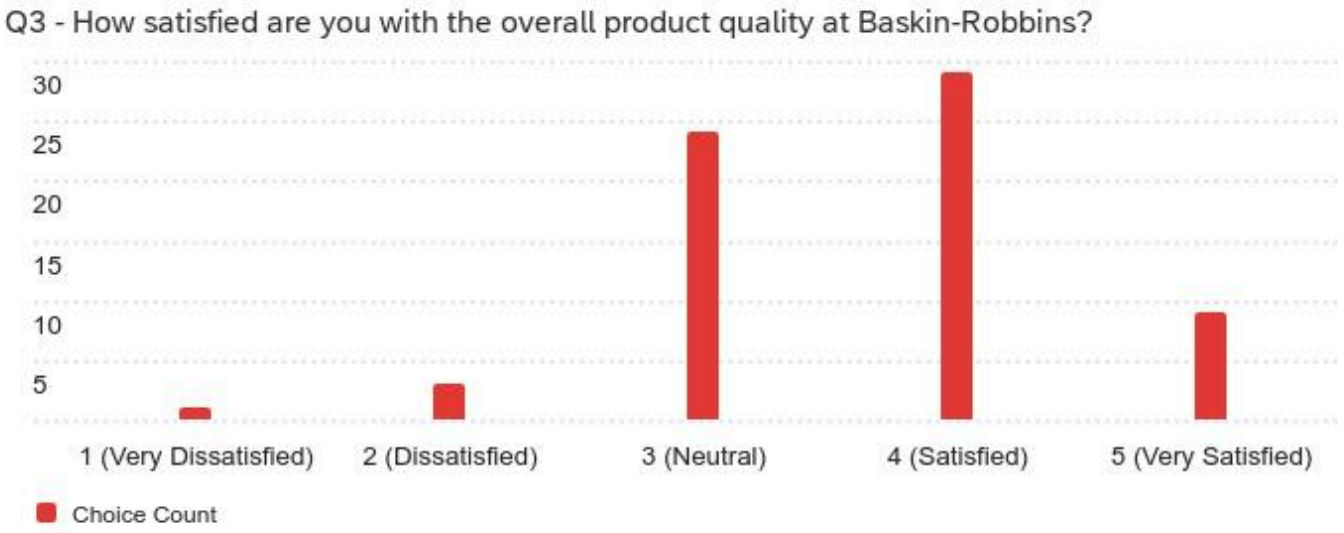
Survey Questions

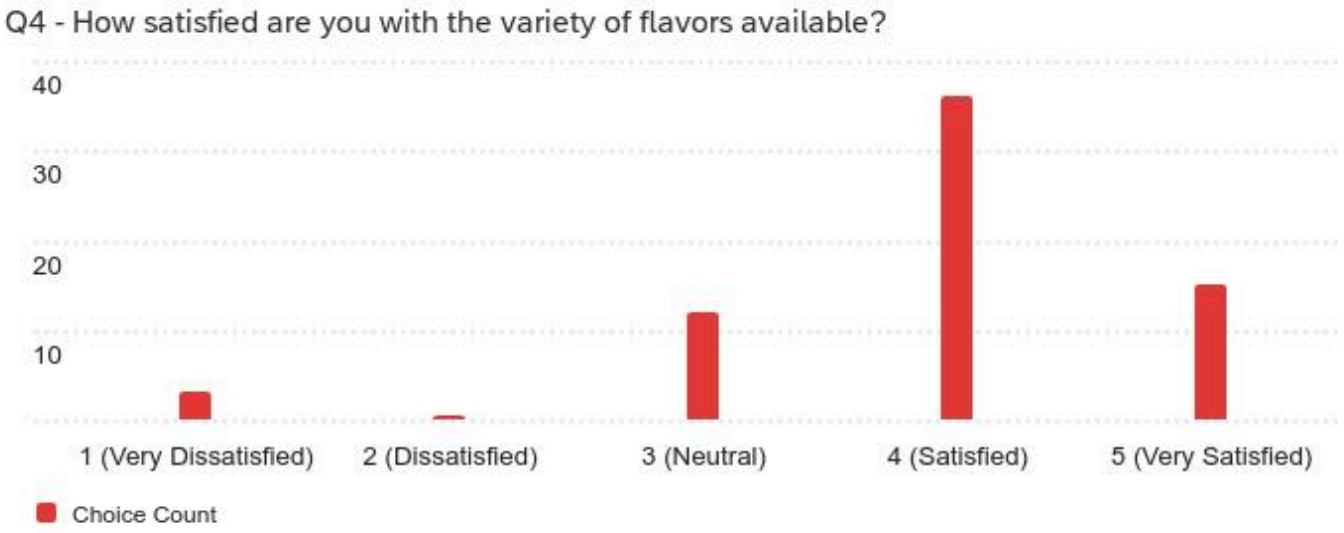
Demographics

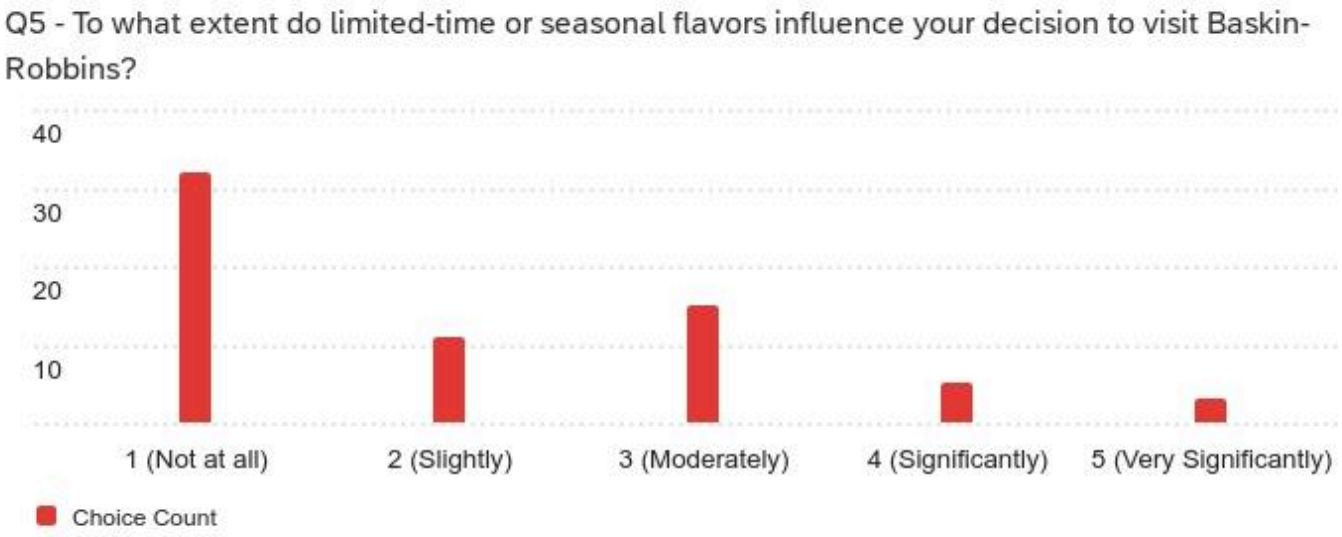




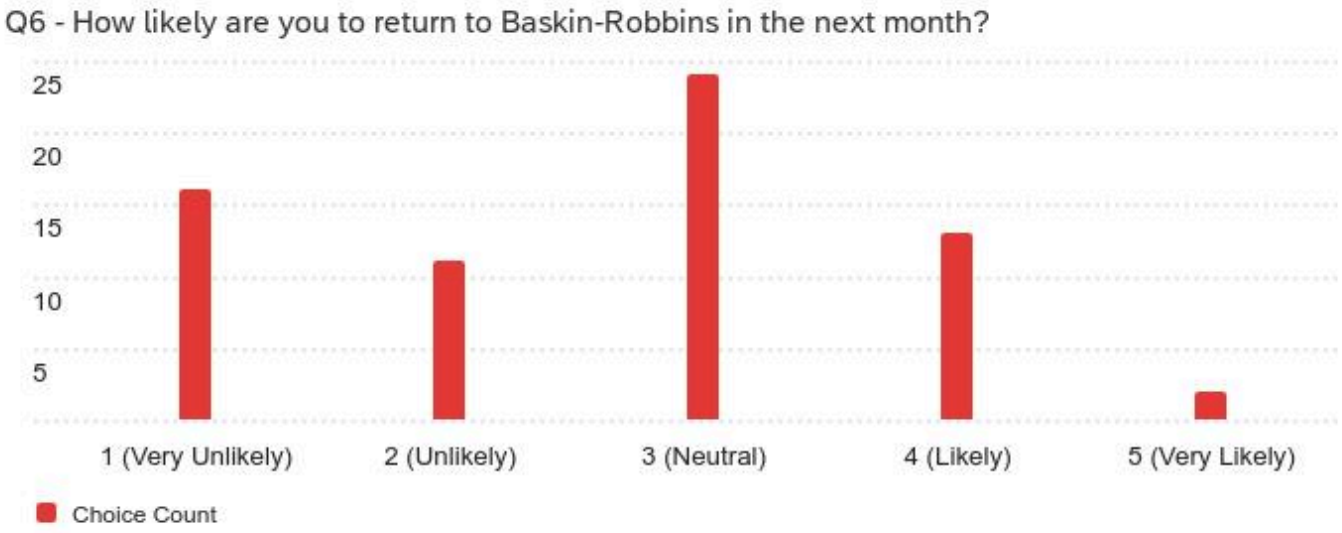
Customer Experience

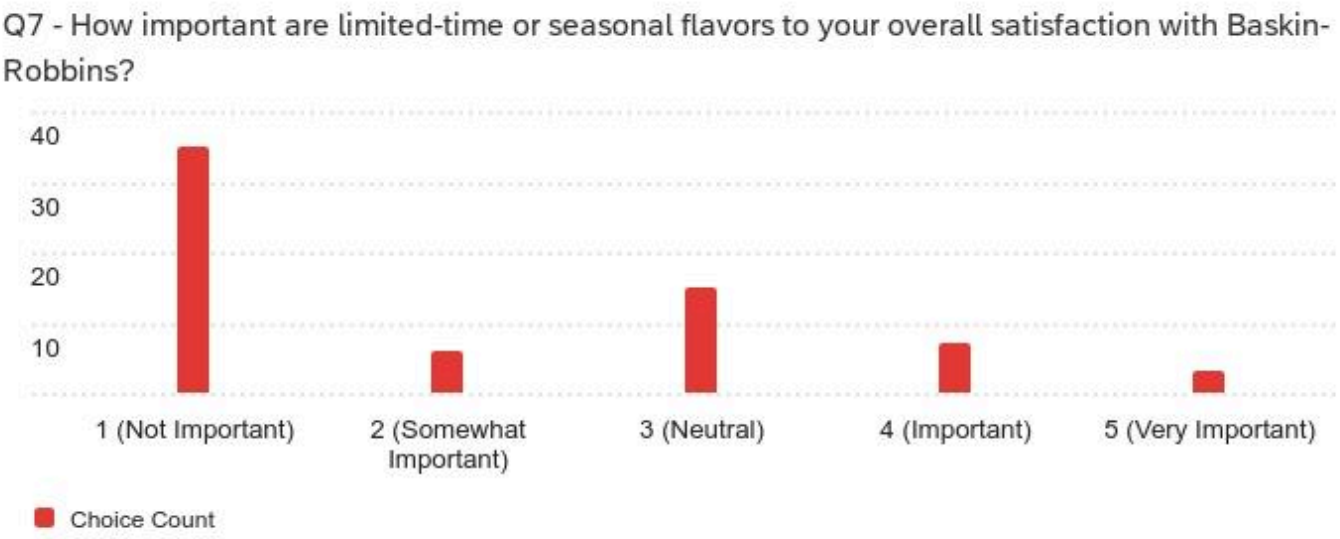


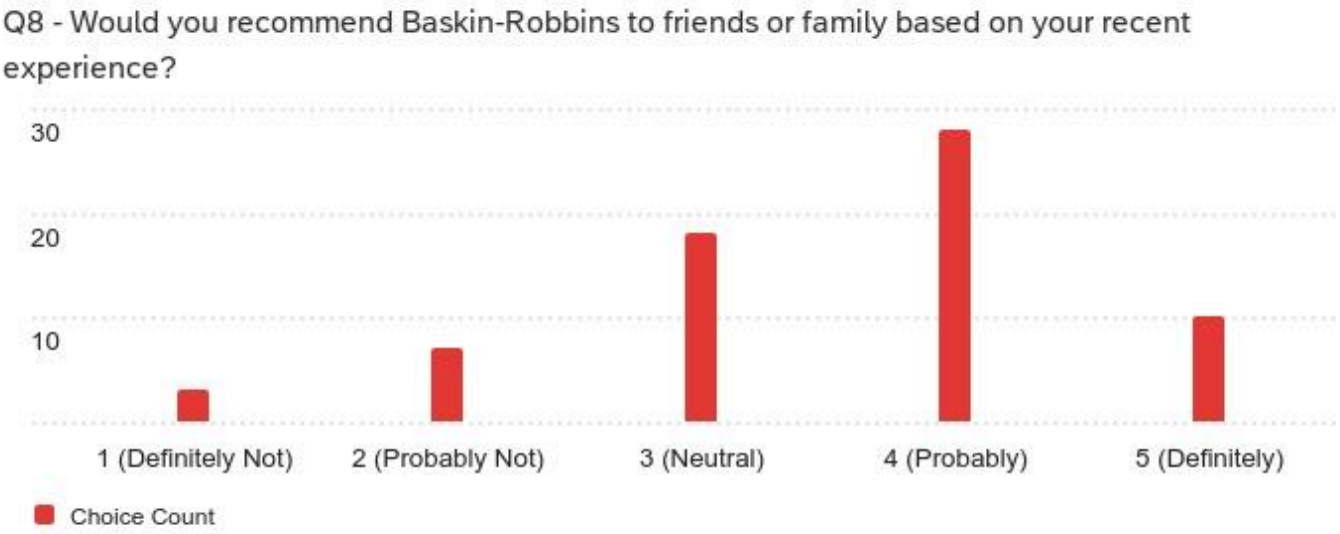




Loyalty and Repeat Business







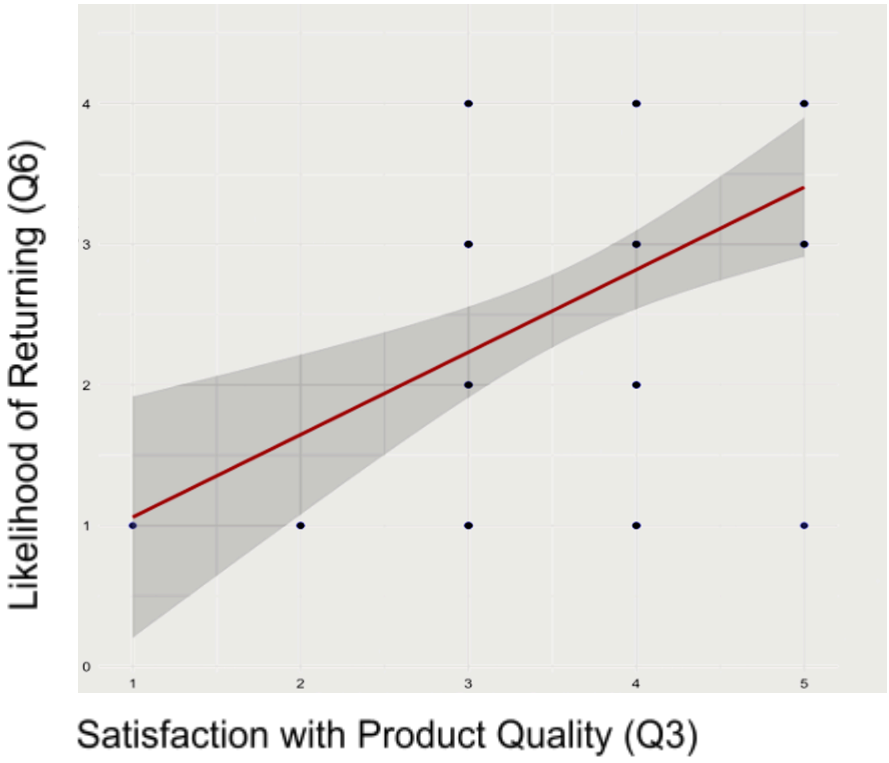
Open-Ended Reponses

Q9 - What do you enjoy most about Baskin-Robbins?

Q10- What changes or additions would you like to see in Baskin-Robbins' offerings (e.g., new flavors, seasonal promotions)?

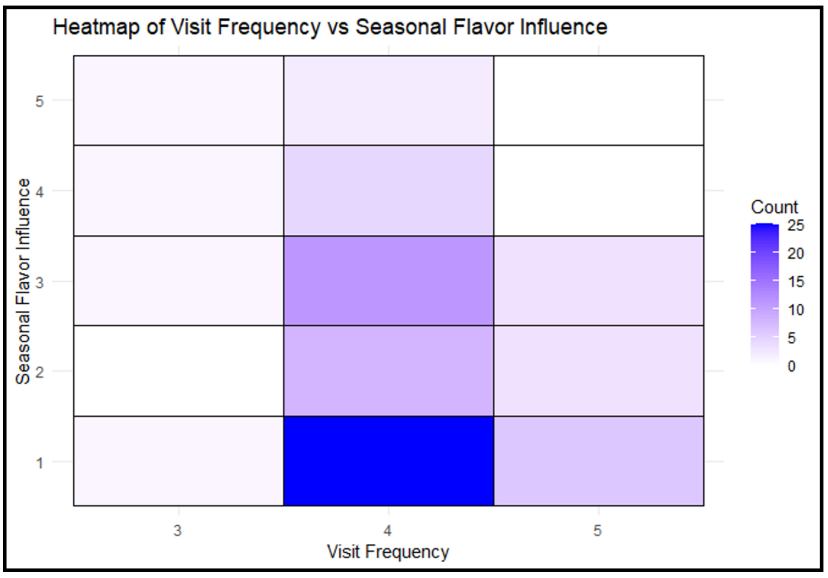
Q11- Please share any other feedback or suggestions you have for us.

Visual 1. Relationship Between Product Quality Satisfaction and Return Likelihood



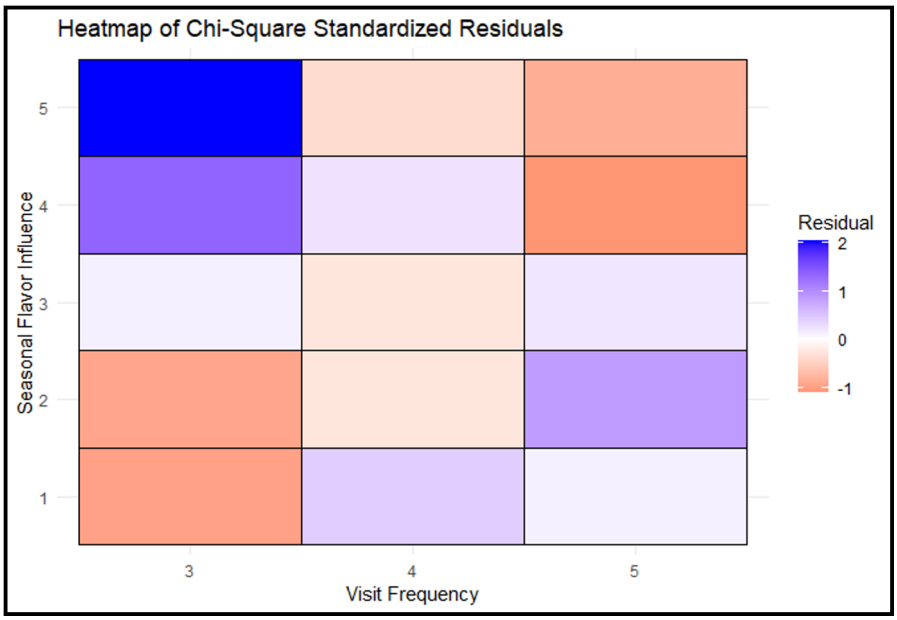
Visual 2: Heatmap of Observed Frequencies (Count-based)

Shows the distribution of visit frequency and seasonal flavor influence.



Visual 3: Heatmap of Standardized Residuals

Blue areas are Higher-than-expected values, while orange areas are lower-than-expected values.



Code for Residuals Plot:

```{r}
library(readxl)
library(ggplot2)
```

```{r}
# Read the file
dataset <- read_excel("6500 project.xlsx")
# Inspect the first few rows
head(data)
```

```{r}
model1 <- lm(q6 ~ q3, data = dataset)
summary (model1)
```

```{r}
model2 <- lm(q6 ~ q4, data = dataset)
summary (model2)
```

```{r}
model3 <- lm(q6 ~ q3 *q4, data = dataset)
summary (model3)
```

```{r}
# Scatter plot with regression line
ggplot(dataset, aes(x = q3, y = q6)) +
  geom_point(color = "blue", alpha = 0.7) + # Scatter points
  geom_smooth(method = "lm", se = TRUE, color = "red") + # Regression line
  labs(
    title = "Relationship Between Product Quality Satisfaction and Return Likelihood",
    x = "Satisfaction with Product Quality (q3)",
    y = "Likelihood of Returning (q6)"
  ) +
  theme_minimal()

# Extract coefficients and confidence intervals for Model 1
coeffs <- summary(model1)$coefficients
conf_int <- confint(model1)

# Create a data frame for visualization
coeff_df <- data.frame(
  Term = rownames(coeffs),
  Estimate = coeffs[, "Estimate"],
```

```
  Lower = conf_int[, 1],
  Upper = conf_int[, 2]
)

# Plot the coefficients
ggplot(coeff_df, aes(x = Term, y = Estimate)) +
  geom_point(color = "blue", size = 4) +
  geom_errorbar(aes(ymin = Lower, ymax = Upper), width = 0.2, color = "red") +
  labs(
    title = "Model 1 Coefficients with Confidence Intervals",
    x = "Predictor",
    y = "Coefficient Estimate"
  ) +
  theme_minimal() +
  coord_flip()

# Calculate residuals and fitted values
dataset$residuals <- residuals(model1)
dataset$fitted <- fitted(model1)

# Residual plot
ggplot(dataset, aes(x = fitted, y = residuals)) +
  geom_point(alpha = 0.7, color = "blue") +
  geom_hline(yintercept = 0, linetype = "dashed", color = "red") +
  labs(
    title = "Residual Plot for Model 1",
    x = "Fitted Values",
    y = "Residuals"
  ) +
  theme_minimal()

# Interaction plot
install.packages("interactions")

library(interactions)

# Create interaction plot for Model 3
interact_plot(
  model3, pred = q3, modx = q4,
  interval = TRUE, int.width = 0.95,
  main.title = "Interaction Between Product Quality and Flavor Variety",
  x.label = "Satisfaction with Product Quality (q3)",
  y.label = "Likelihood of Returning (q6)"
```

Code for Heat Maps:

```
library(readxl)
library(ggplot2)
library(reshape2)

Data6500 <- <- read_excel("6500 project.xlsx")

print("Data Structure:")
print(str(Data6500))

filtered_data <- Data6500[
  Data6500$`How often do you visit Baskin-Robbins?` %in% 1:5 &
        Data6500$`To what extent do limited-time or seasonal flavors influence your decision to visit
Baskin-Robbins?` %in% 1:5,
]

print("Filtered Data:")
print(head(filtered_data))

filtered_data$`How often do you visit Baskin-Robbins?` <- as.factor(filtered_data$`How often do you visit
Baskin-Robbins?`)
filtered_data$`To what extent do limited-time or seasonal flavors influence your decision to visit
Baskin-Robbins?` <- as.factor(filtered_data$`To what extent do limited-time or seasonal flavors influence your
decision to visit Baskin-Robbins?`)

contingency_table <- table(
  filtered_data$`How often do you visit Baskin-Robbins?`,
  filtered_data$`To what extent do limited-time or seasonal flavors influence your decision to visit
Baskin-Robbins?`
)

print("Contingency Table:")
print(contingency_table)

chi_sq_test <- chisq.test(contingency_table)

print("Chi-Square Test Results:")
print(chi_sq_test)

heatmap_data <- as.data.frame(contingency_table)
colnames(heatmap_data) <- c("Visit Frequency", "Seasonal Flavor Influence", "Count")

print("Heatmap Data:")
print(head(heatmap_data))
```

```
ggplot(heatmap_data, aes(x = `Visit Frequency`, y = `Seasonal Flavor Influence`, fill = Count)) +
  geom_tile(color = "black") +
  scale_fill_gradient(low = "white", high = "blue") +
  labs(
        title = "Heatmap of Visit Frequency vs Seasonal Flavor Influence",
        x = "Visit Frequency",
        y = "Seasonal Flavor Influence",
        fill = "Count"
  ) +
  theme_minimal()

residuals <- as.data.frame(as.table(chi_sq_test$stdres))
colnames(residuals) <- c("Visit Frequency", "Seasonal Flavor Influence", "Residual")

print("Residuals Data:")
print(head(residuals))

ggplot(residuals, aes(x = `Visit Frequency`, y = `Seasonal Flavor Influence`, fill = Residual)) +
  geom_tile(color = "black") +
  scale_fill_gradient2(low = "red", mid = "white", high = "blue", midpoint = 0) +
  labs(
        title = "Heatmap of Chi-Square Standardized Residuals",
        x = "Visit Frequency",
        y = "Seasonal Flavor Influence",
        fill = "Residual"
  ) +
  theme_minimal()
```