Marketing decision for fast food restaurant chains during pandemic

Group 8

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Introduction

The COVID-19 pandemic forced the restaurant industry to innovate and adapt rapidly. Financial strategies focused on managing costs and securing relief. Many restaurants had to temporarily or permanently close locations urgently without proper planning, then loss a large amount of money.

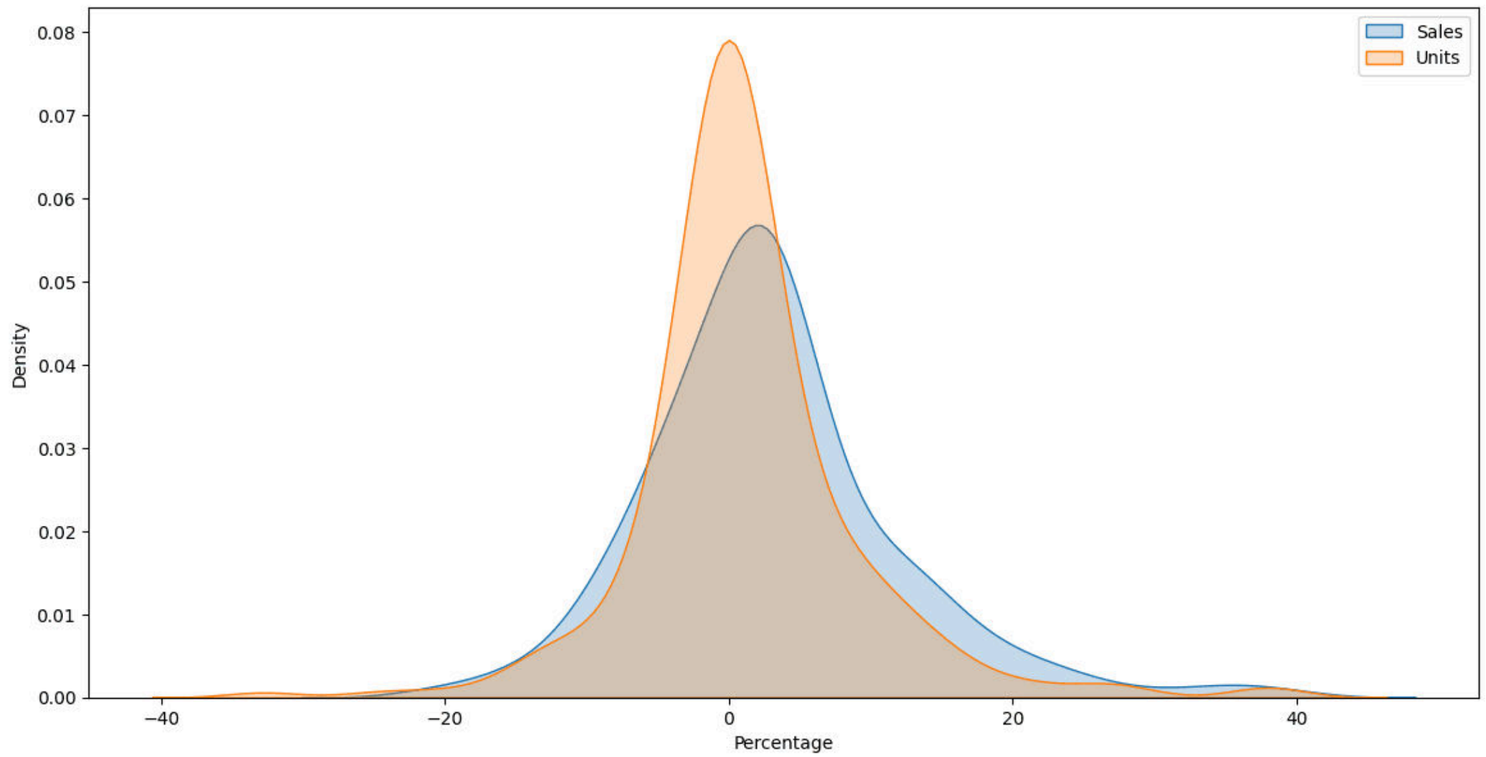
Some restaurants adjusted their menus to focus on items that were easier to prepare and could be offered at a lower price point to attract cost-conscious customers to make more revenue.

Exploring the data

Type distribution

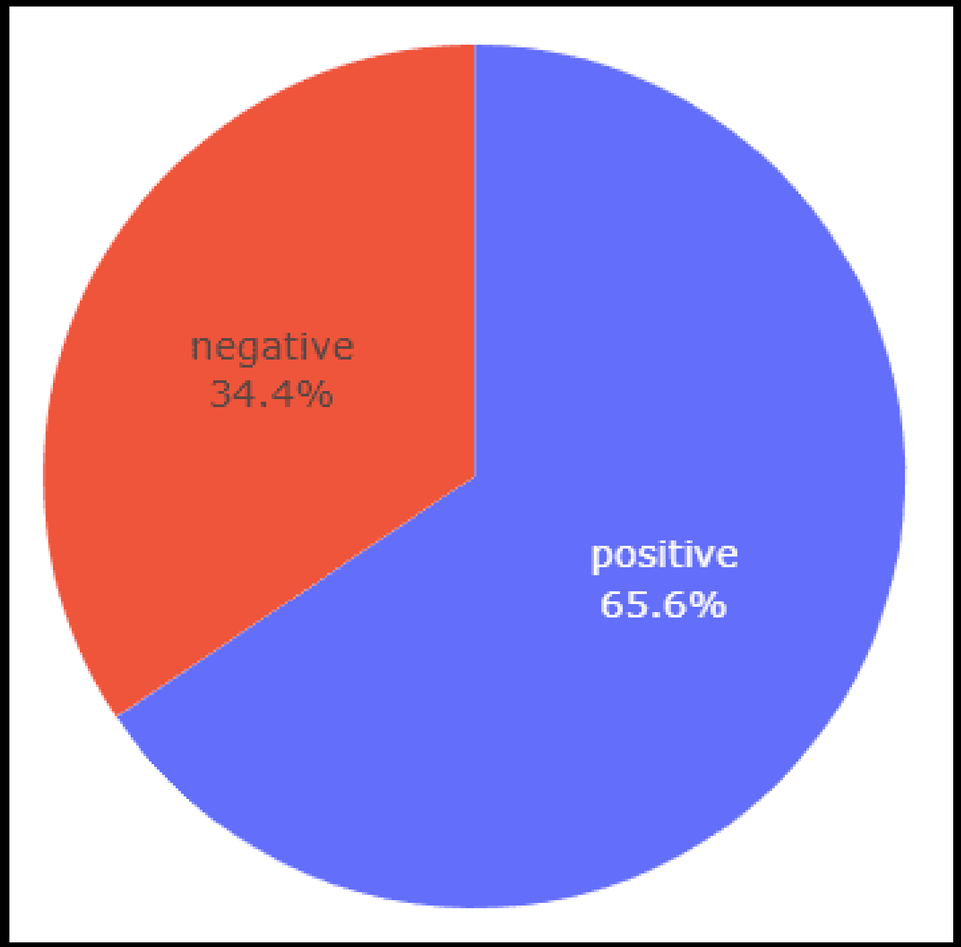
250 restaurants are made up by:

- 25%: Burger
- 13%: Cafe
- 12% Pizza
- 11%: Chicken
- 9%: Sandwich
- 8%: Mexican



YOY distribution

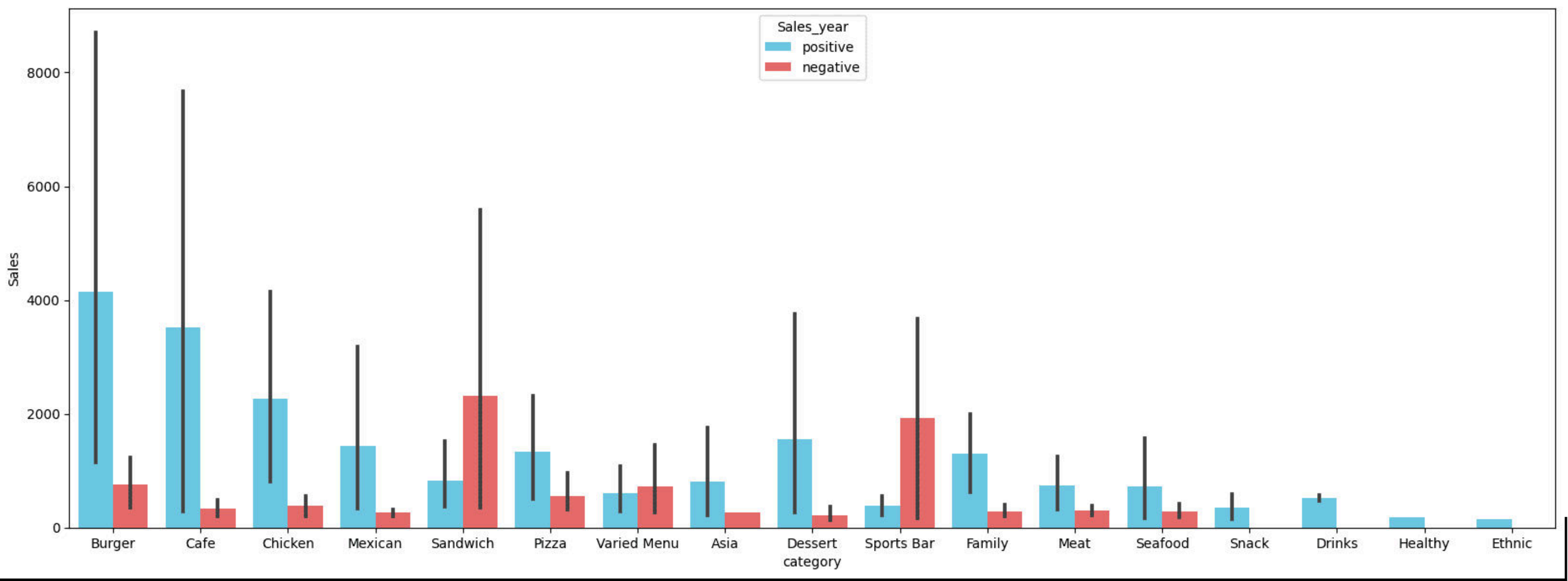
The increase of YOY-Sales and YOY-Units presents normal distribution around 0, the general trend has not leak to one side due to the impact of COVID. These distributions shows us that year on year sales percentage no more than 40%.



Positive or Negative impact

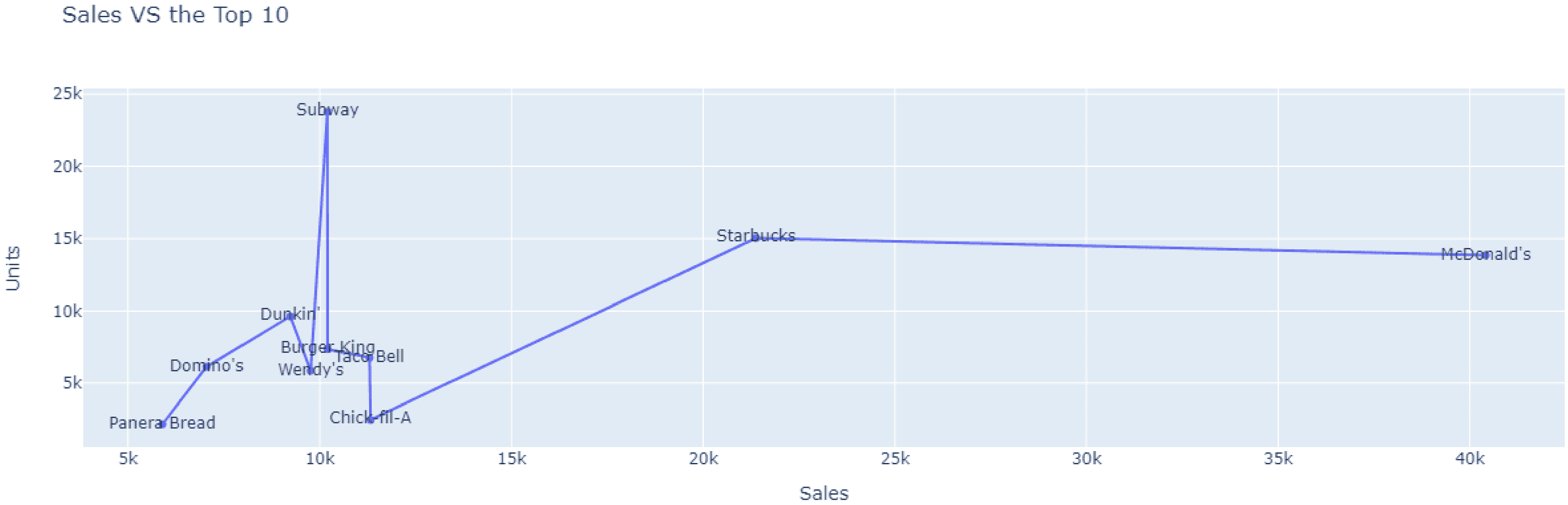
A significant majority, 65.6%, of restaurants experienced positive sales changes during the COVID-19. It indicates that despite the challenges posed by the pandemic, many chain restaurants were able to adapt and find ways to increase their sales.

On the other hand, 34.4% of restaurants faced negative sales changes. Maybe because of some factors such as lockdowns, customers reduction, and other pandemic-related disruptions.



During these restaurant has negative impact, they are:

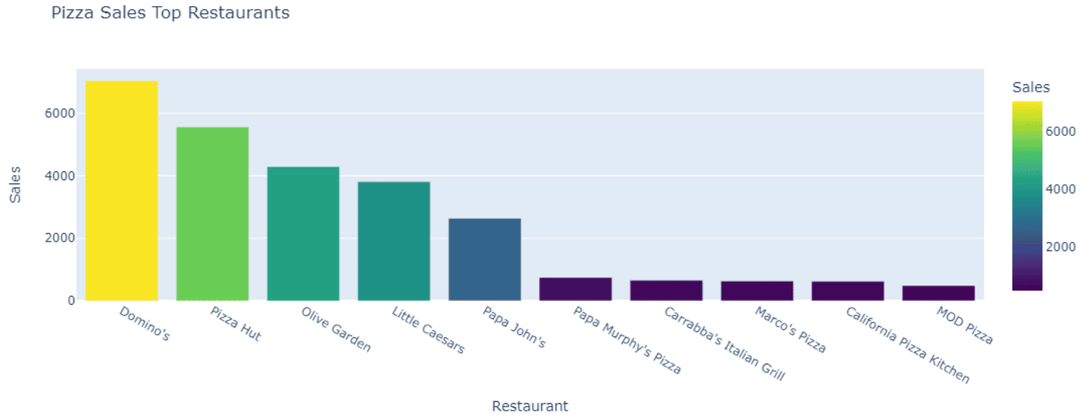
- **Varied menu**
- **Sandwiches**
- **Sports bar**



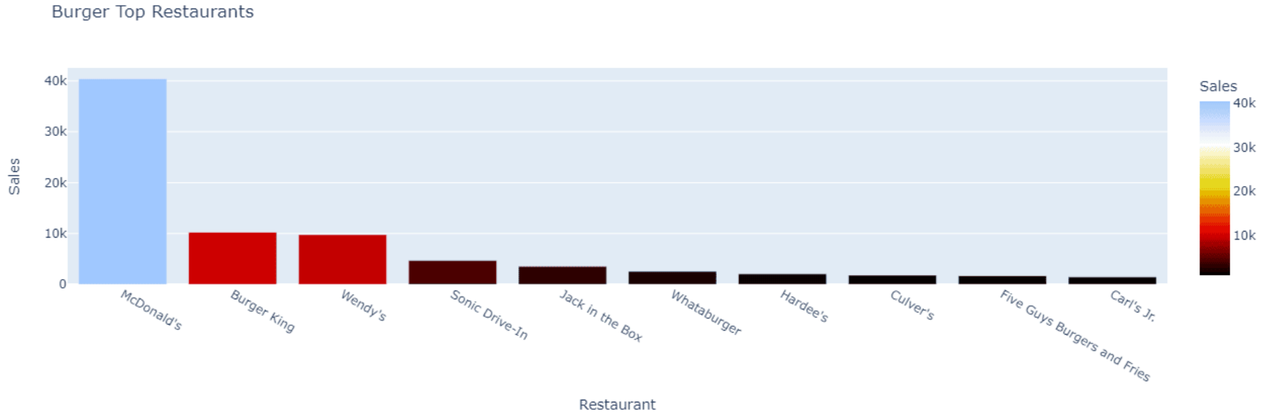
- McDonald's leads in sales 40k with 15k shops.
- Subway follows with 25k shops but ranks 6th with 10k sales.
- Starbucks matches McDonald's in shops but lags in sales with only 20k.

Each chain's sales performance varies despite their number of shops. Maybe because of their brand population, the cost of the meals, or the method of service.

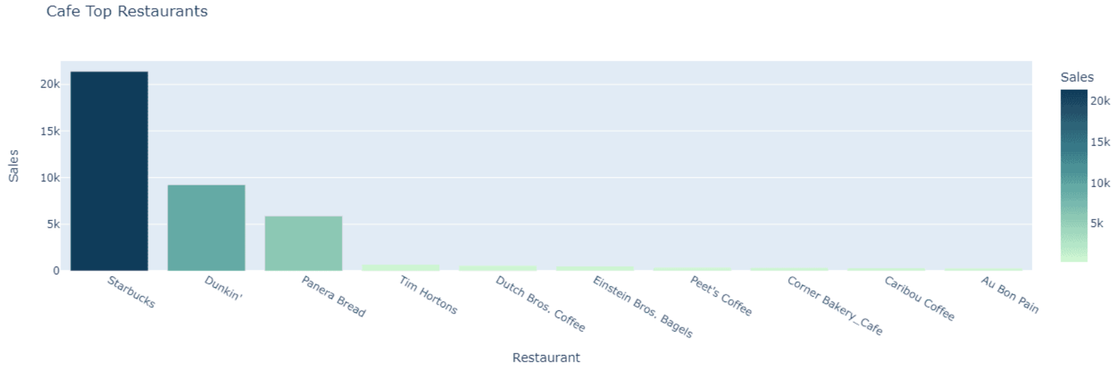
Best: Subway



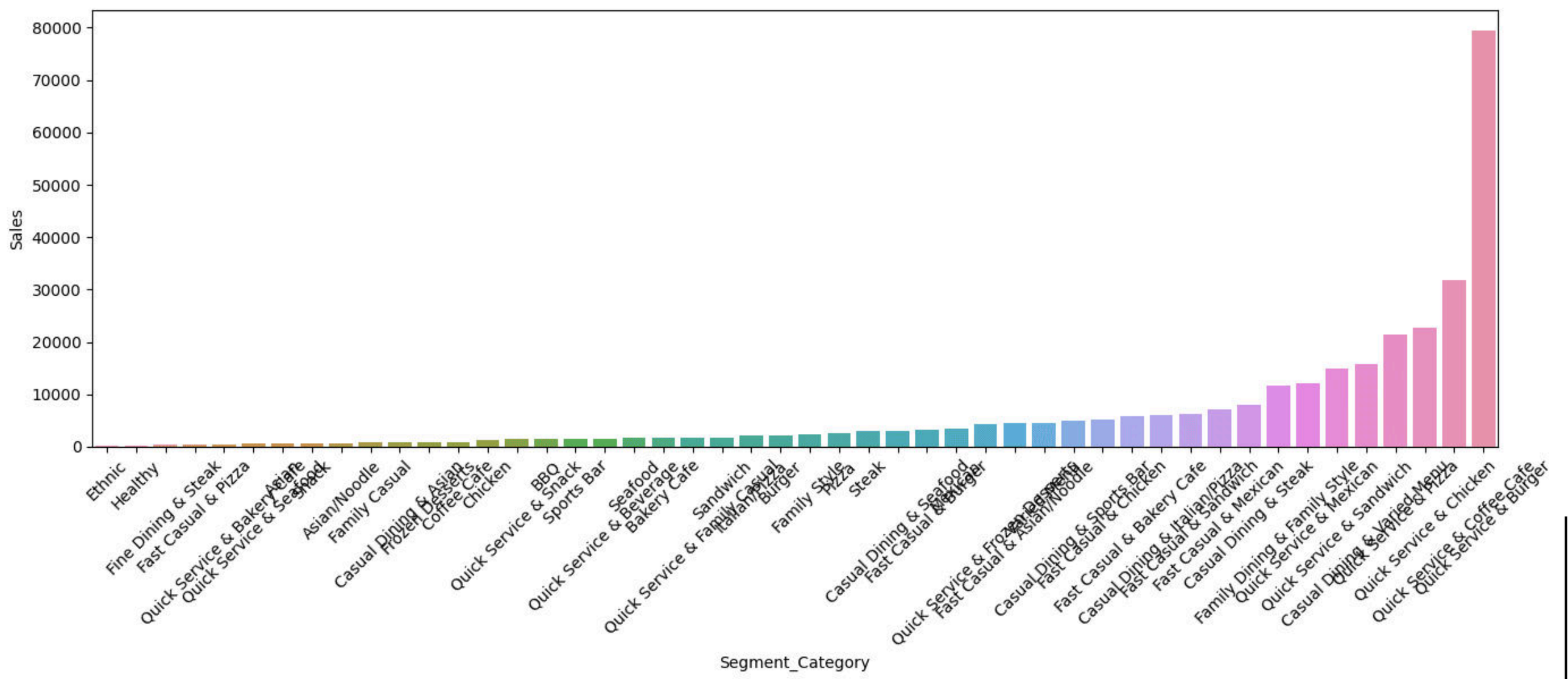
Best: Domino's



Best: McDonald's



Best: Starbucks



Top 4 are all related to quick service

Model training

Model chosen

In our project, we chose to use Random Forest due to its ability to handle complex dataset. Its flexibility in handling both categorical and numerical data, makes it an ideal choice for our diverse dataset. By leveraging Random Forest, we aim to achieve a high level of accuracy and generalization in our predictive modeling tasks.

```
from sklearn.ensemble import RandomForestRegressor
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2, random_state=0)

forest = RandomForestRegressor()
forest.fit(x_train, y_train)

y_pred = forest.predict(x_test)

print("MSE:", mean_squared_error(y_test, y_pred))
print("MAE:", mean_absolute_error(y_test, y_pred))
print("R²:", r2_score(y_test, y_pred))
```

[322] ✓ 0.1s

```
MSE: 1201894.8145939996
MAE: 202.58779999999996
R²: 0.6291633368500761
```

Model Evaluation

- The MSE and MAE values here are large, indicating that the model is not so accurate in predictions. A higher MSE and MAE indicates a larger gap between prediction and actual values.
- The R^2 here is about 0.63, shows that the model can explain only about 63% of the variation, and 37% of the variation is unexplained, indicating that the model has certain accuracy, but there is still space for improvement.

Business Decision and Marketing Strategies

- Based on sales and restaurant category data during the pandemic era, we can identify target markets with the highest potential (e.g., quick service or burger).
- Analyze sales data to identify the restaurant categories with the fastest sales growth, then expand the number of chains in these categories in potential markets during the pandemic era.
- Use data to analyze customer behavior, understand customer preferences and needs for the impact of the pandemic, and then improve menus and services accordingly. For example, for family restaurants, add popular menu options, like pizza or cafe for take out, to enhance the dining variety and experience.

Improvements after Implementing Business & Marketing Strategies

- Through precise marketing, sales are expected to increase significantly. Especially in high-potential markets in the pandemic era, sales of target customer groups will increase significantly.
- Expanding the number of chain stores in high-sales categories can increase the brand's market share, increase market influence, and enhance brand awareness, not only during the pandemic era but also during the normal one.
- By improving the customer experience and regularly optimizing the menu, customer satisfaction will be significantly improved, the proportion of repeat customers will increase, and customer loyalty will be enhanced, not only during the pandemic era but also during the normal one.

Thank you