Organic Market Basket Analysis

GreenGrocer
Stuart Clark

Background

- Texas A&M - Environmental Science
- 6 years in IT Recruitment & Sales
- Flatiron School - Data Science

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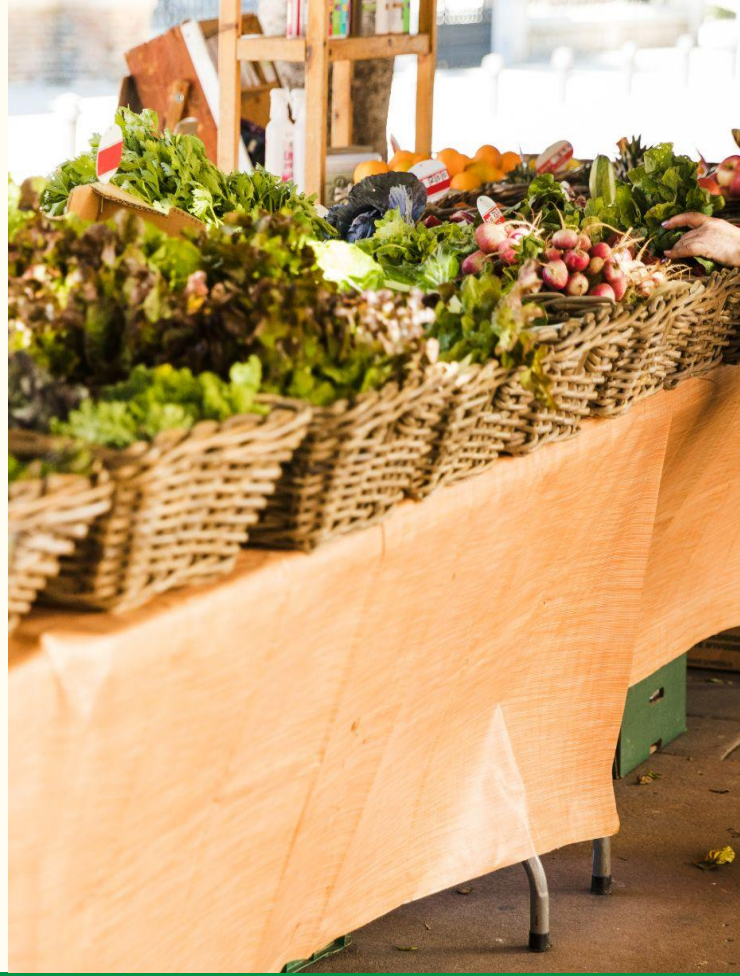
01 Business Overview



Bottom Line

The global Organic food market is estimated to be worth $553 billion by the end of 2033.

Overview

The organic food market is experiencing rapid growth, driven by increasing consumer awareness of health and sustainability.

With the demand for organic products and online shopping on the rise, GreenGrocer wants to position itself to tap into this expanding market by introducing an Organic grocery delivery service.

Why is this Important?

With increasing concerns about the use of pesticides, GMOs, and other harmful additives in conventional food products, more people are turning to organic food for a healthier and sustainable diet.

6%

Total food sales in the U.S.

76%

Of Americans purchased organic food products in the last month

82%

U.S. households have organic food in their kitchens

02
Data Overview

The Data

The dataset used comes from online grocery orders from more than 200,000 Instacart users. The data was filtered down to only focus on Organic Products. The dataset includes information on the following:

- 190,000 users
- 2.3 million orders
- 5000 Organic products

03 Data Analysis

Organic Power!

32%

Organic Products

69%

Organic Reorders

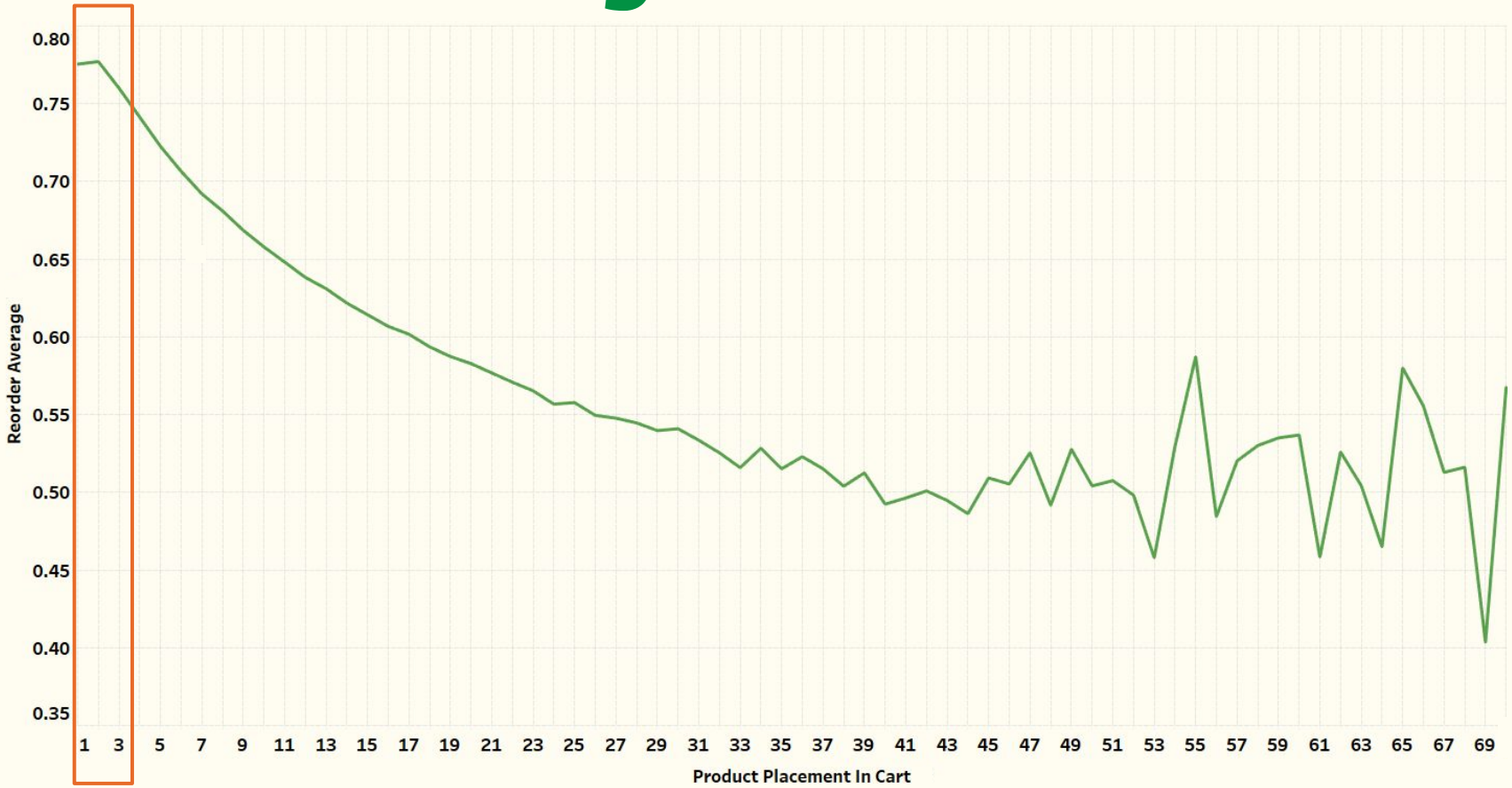
Predictive Insights

Organic Produce

Product Placement

Produce, Produce, Produce!

You Only Get One Shot



04 Modeling

Results

75%

Decision Tree

Baseline

84%

XGBoost

82%

Logistic Regression

Feature Importance

Apriori & Association Rules

A	B	Support	Lift
Organic Bag of Bananas	Organic Hass Avocado	2%	1.8
Organic Hass Avocado	Organic Strawberries	2%	1.7
Organic Strawberries	Organic Baby Spinach	2%	1.4

Cart Optimization

Bag of Organic Bananas

- Organic Baby Spinach
- Organic Hass Avocado
- Organic Lemon
- Organic Strawberries
- Organic Yellow Onion

Organic Strawberries

- Organic Raspberries
- Organic Hass Avocado
- Bag of Organic Bananas
- Organic Baby Spinach

05

Recommendations

Recommendations

01 Promotions & Marketing

➔ Use targeted marketing campaigns on Organic produce

02 Encourage Frequent Purchases

➔ Personalize recommendations based on purchase history, frequent purchases, and similar products purchased by other customers

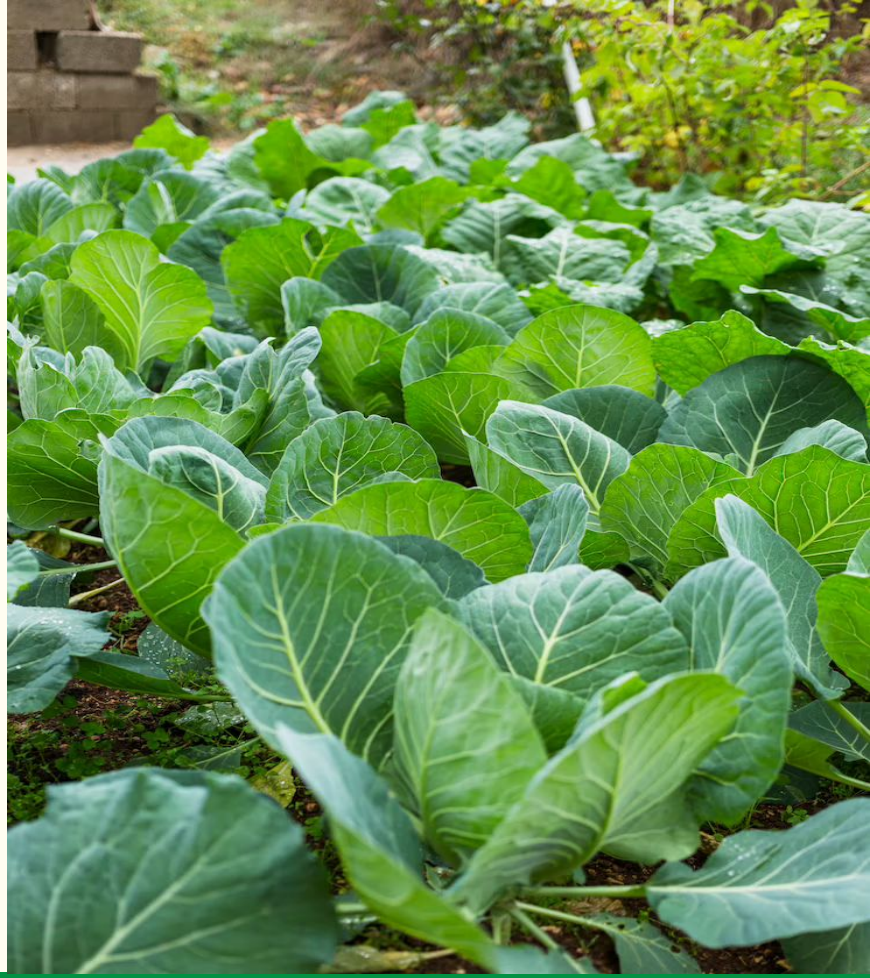
03 Customer Retention

➔ Offer Subscription and/or Loyalty Rewards programs

04 Enhance Product Placement

➔ Implement "quick add" or one-click reordering features for faster checkout

06 Future Steps



Future Steps

- Explore alternative ways to handle class imbalance and engineer more features to improve my models performance

- Apply Deep Learning models to extract better insights from the data.

- Use Association rule results to build a recommendation system to personalize the shopping experience for customers

Thanks!

Do you have any questions?

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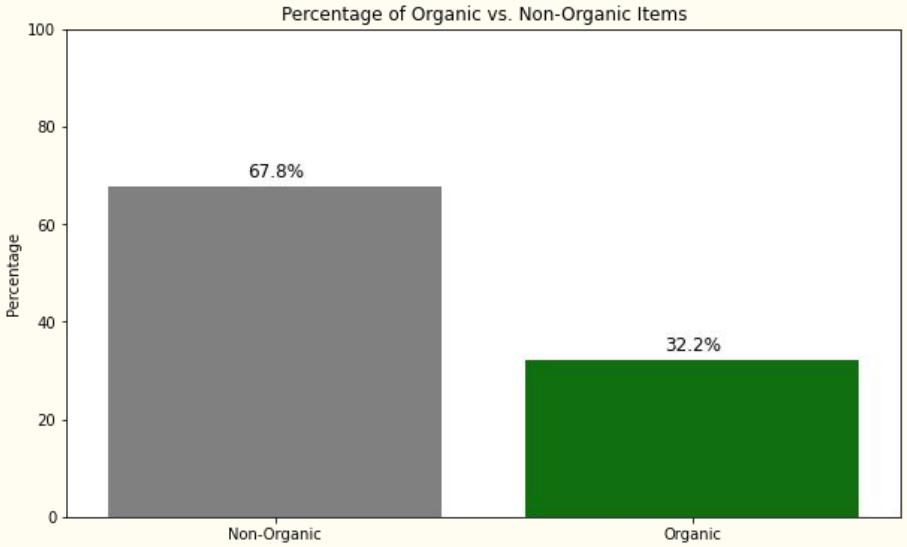
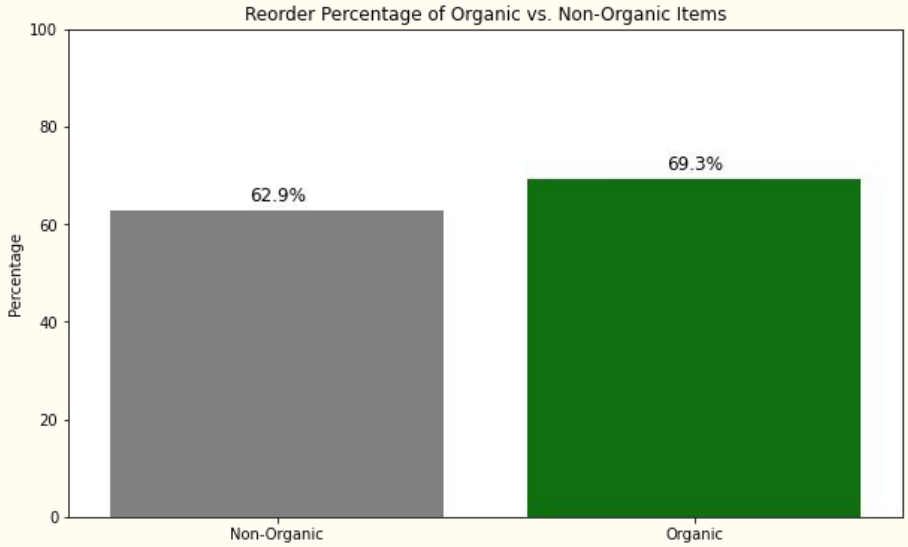
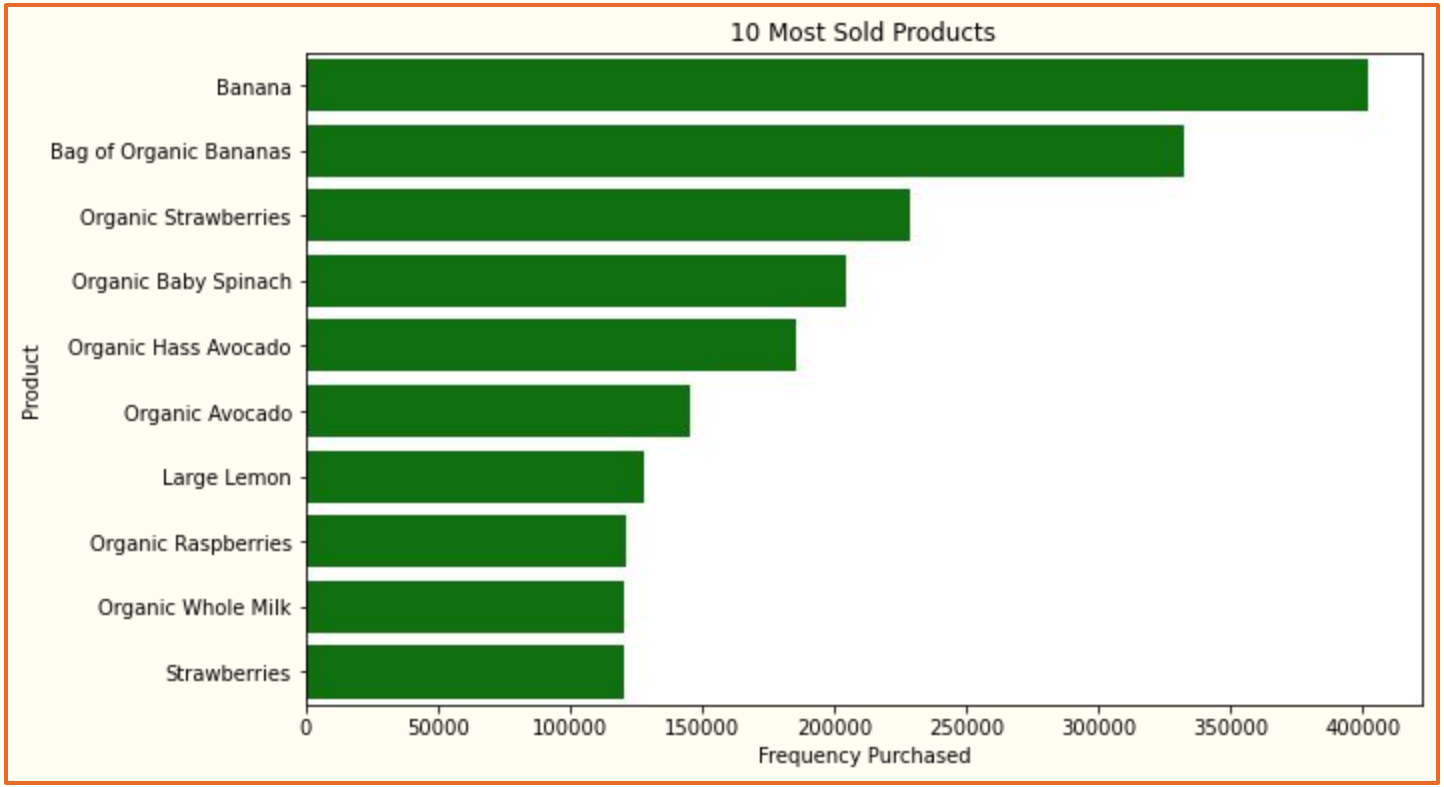
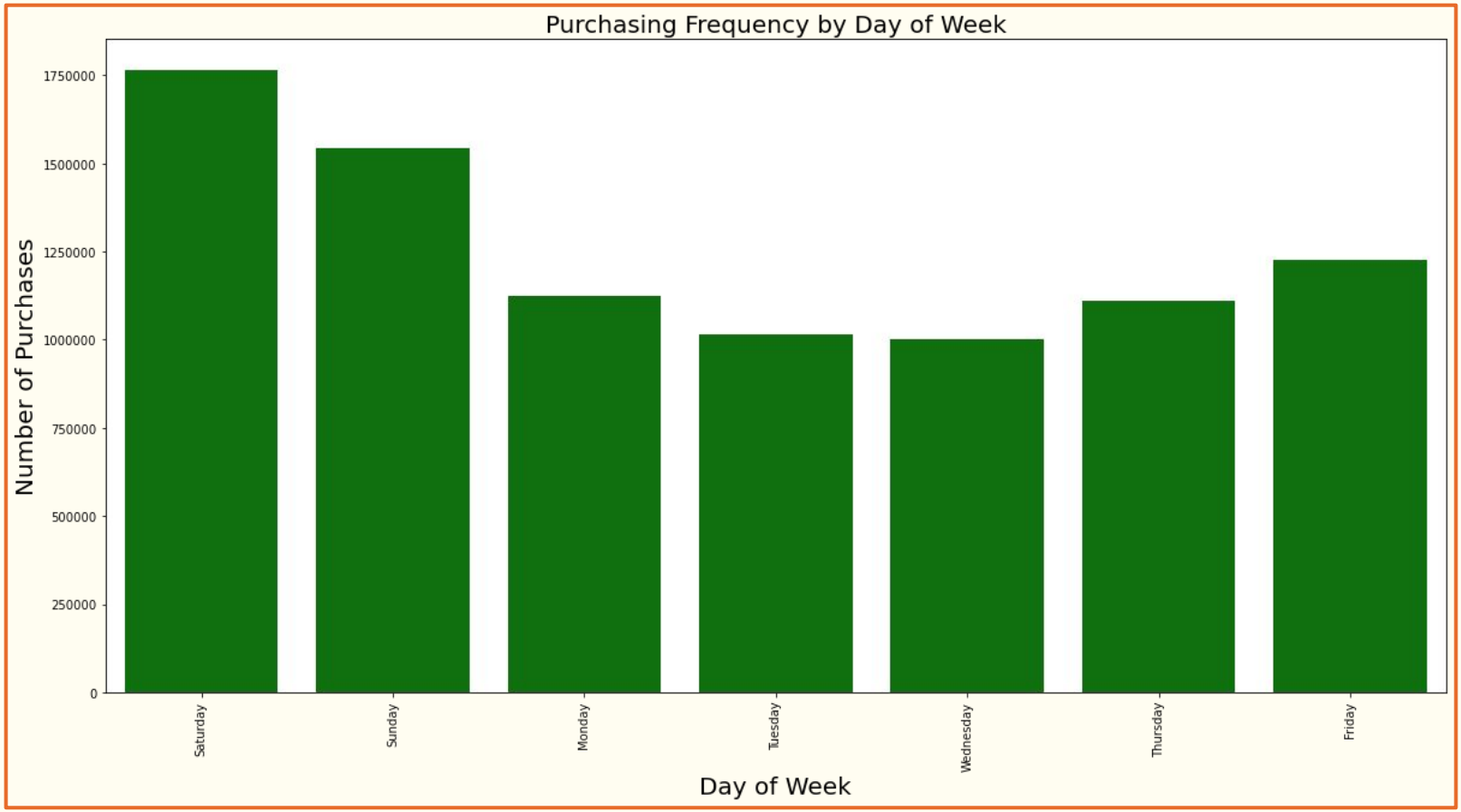
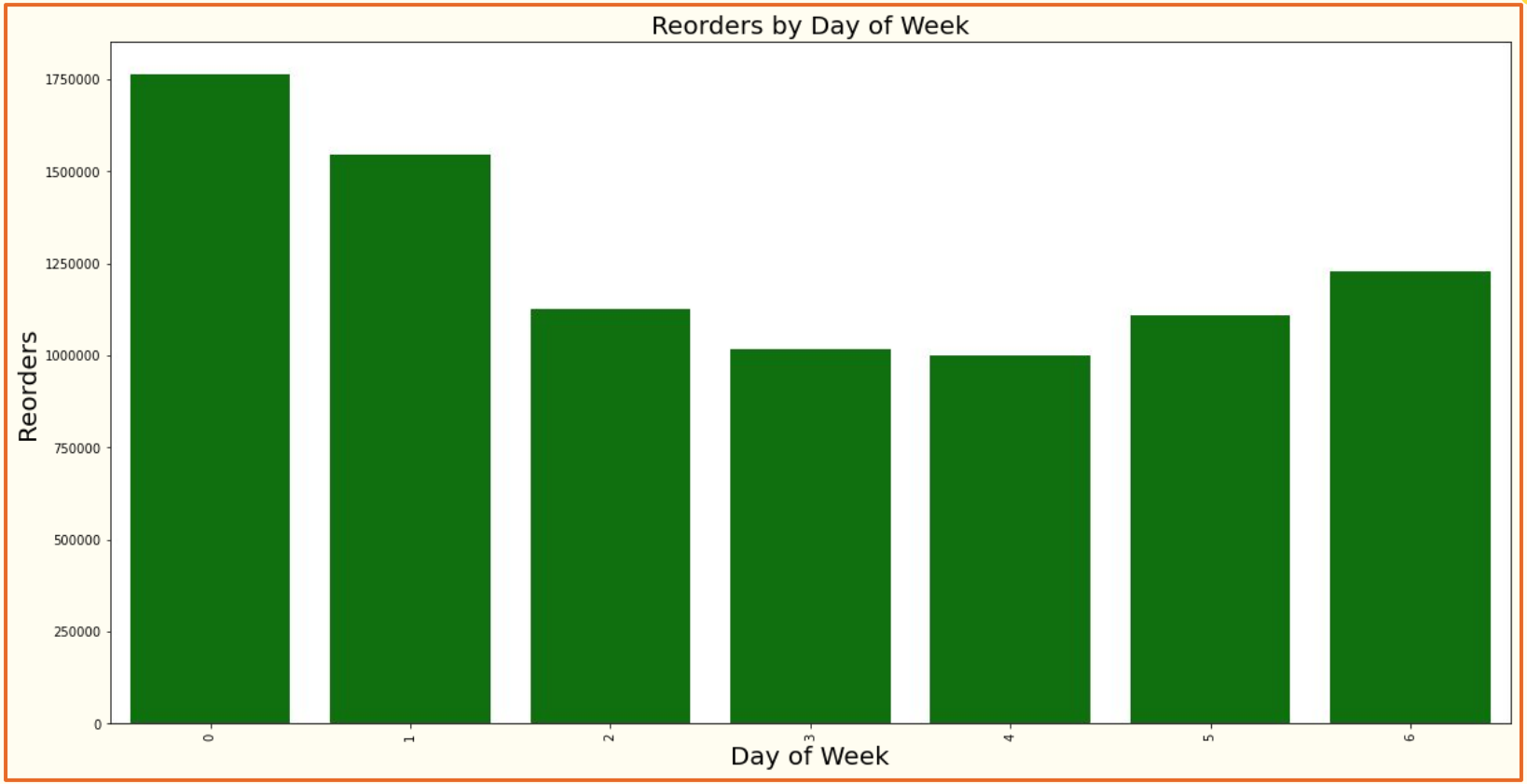
Appendix

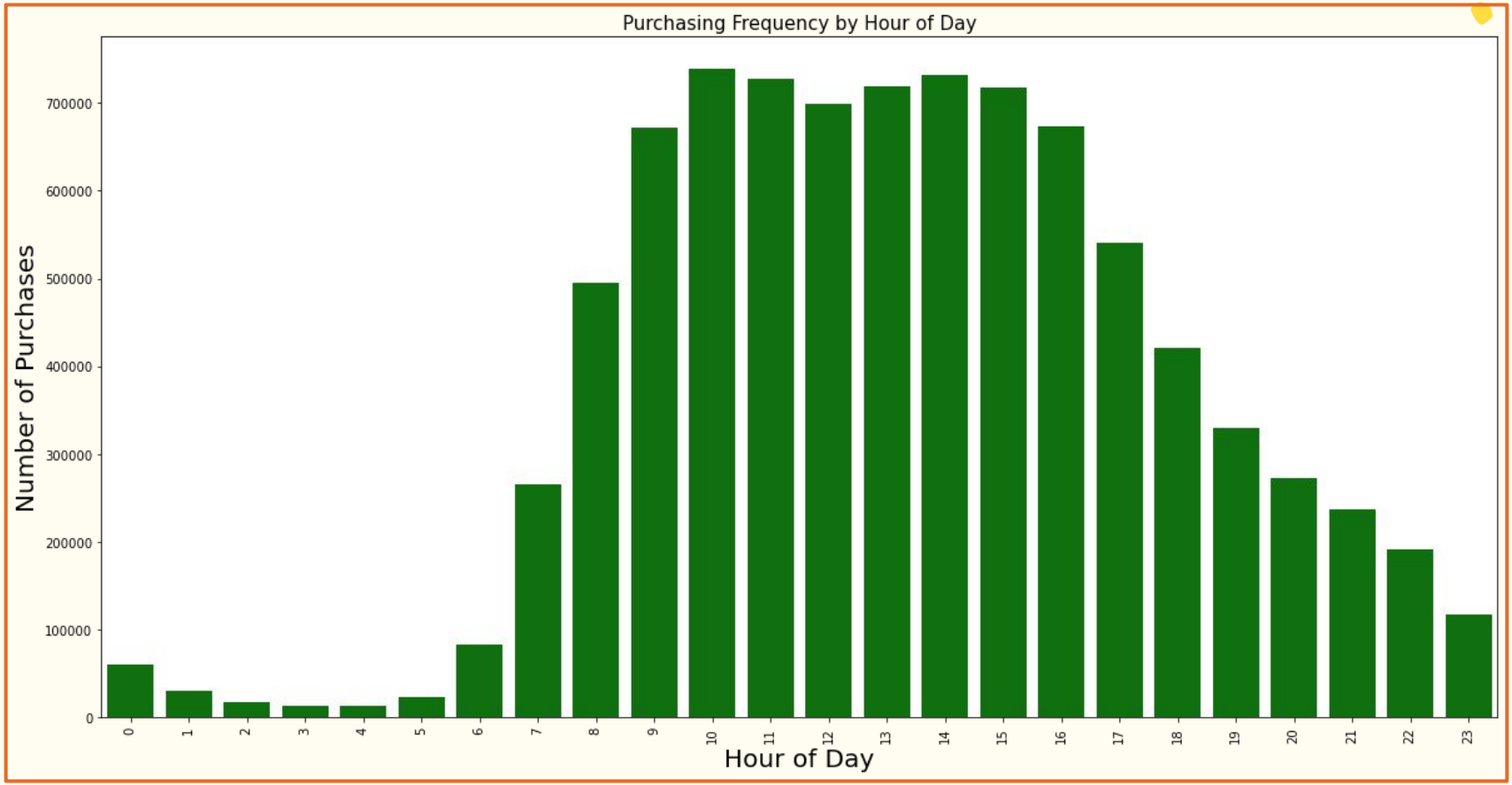

Percentage of Organic vs. Non-Organic Items
Percentage
100
80
60
40
20
0
67.8%
32.2%
Non-Organic
Organic

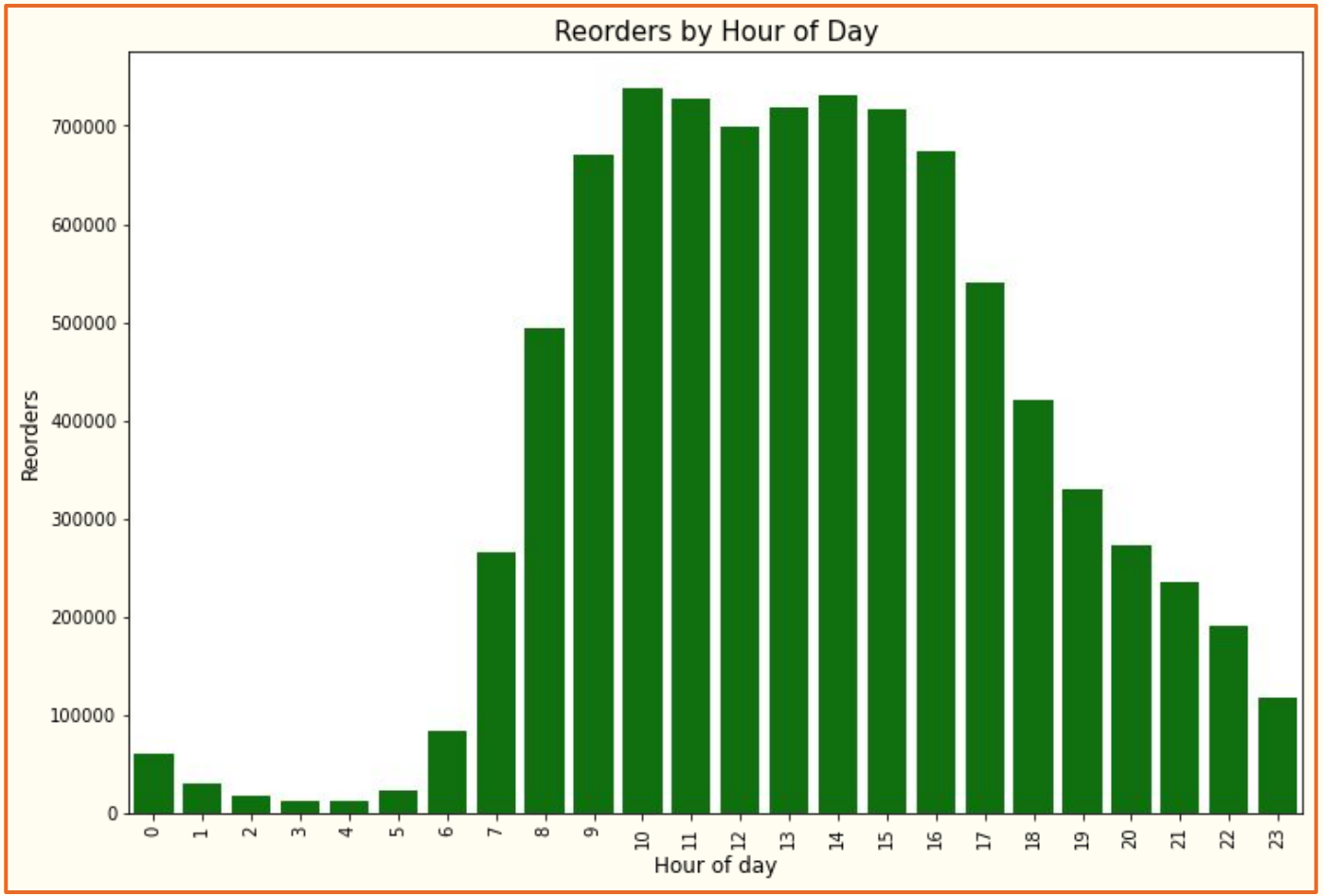

Reorder Percentage of Organic vs. Non-Organic Items
Percentage
100
80
60
40
20
0
62.9%
69.3%
Non-Organic
Organic

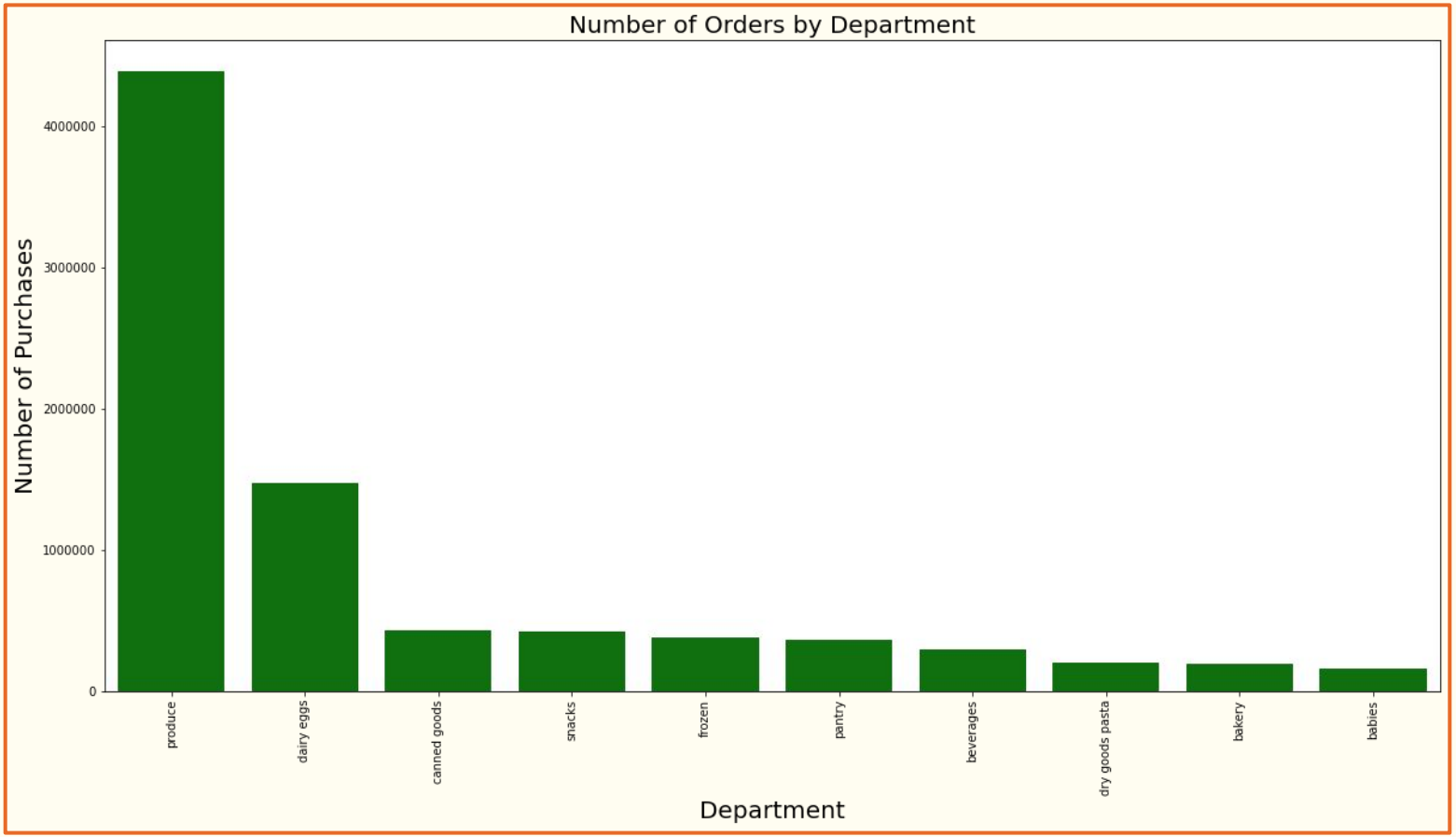

10 Most Sold Products
Banana
Bag of Organic Bananas
Organic Strawberries
Organic Baby Spinach
Organic Hass Avocado
Organic Avocado
Large Lemon
Organic Raspberries
Organic Whole Milk
Strawberries
Product
0
50000
100000
150000
200000
250000
300000
350000
400000
Frequency Purchased

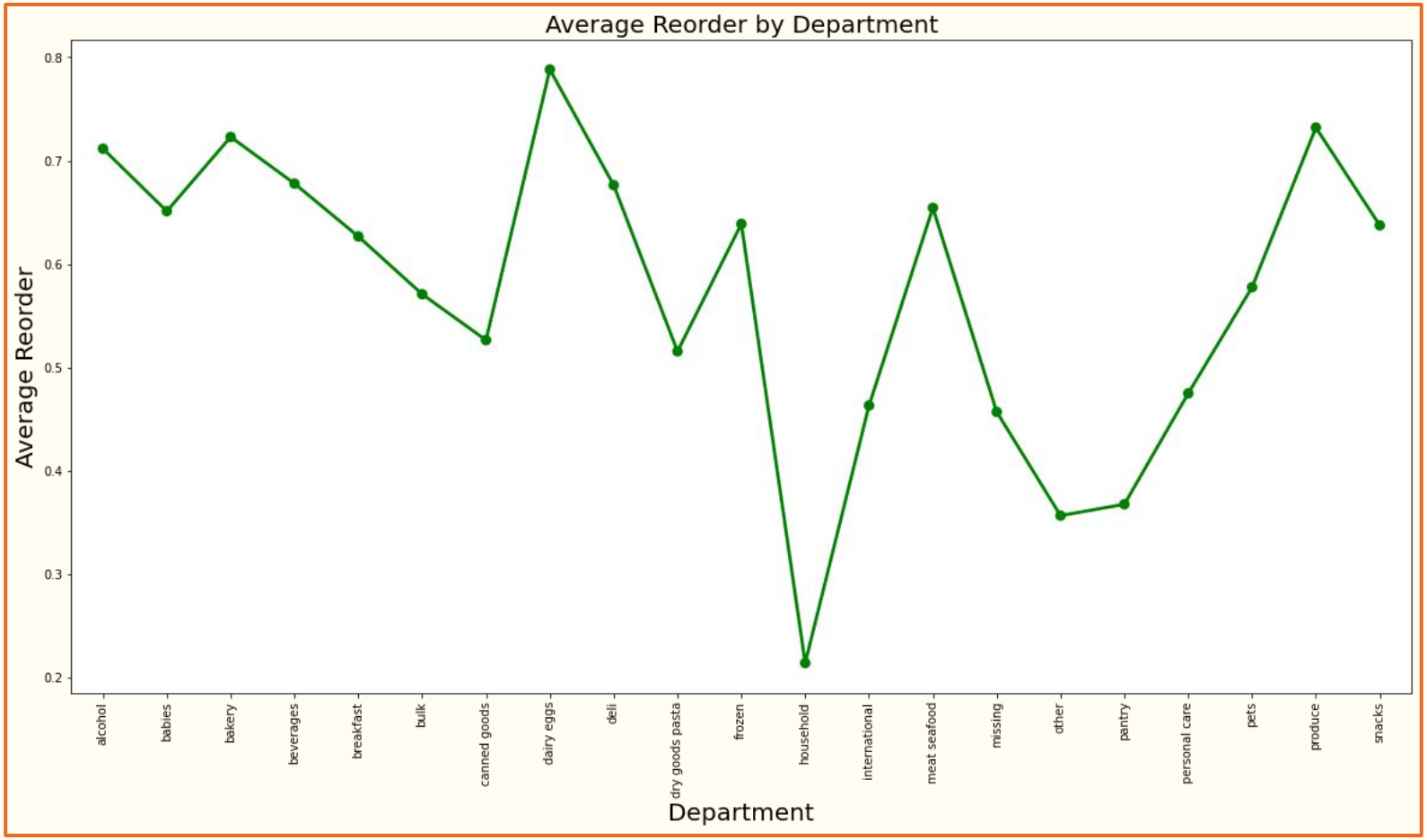

Purchasing Frequency by Day of Week
Number of Purchases
1750000
1500000
1250000
1000000
750000
500000
250000
0
Saturday
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Day of Week

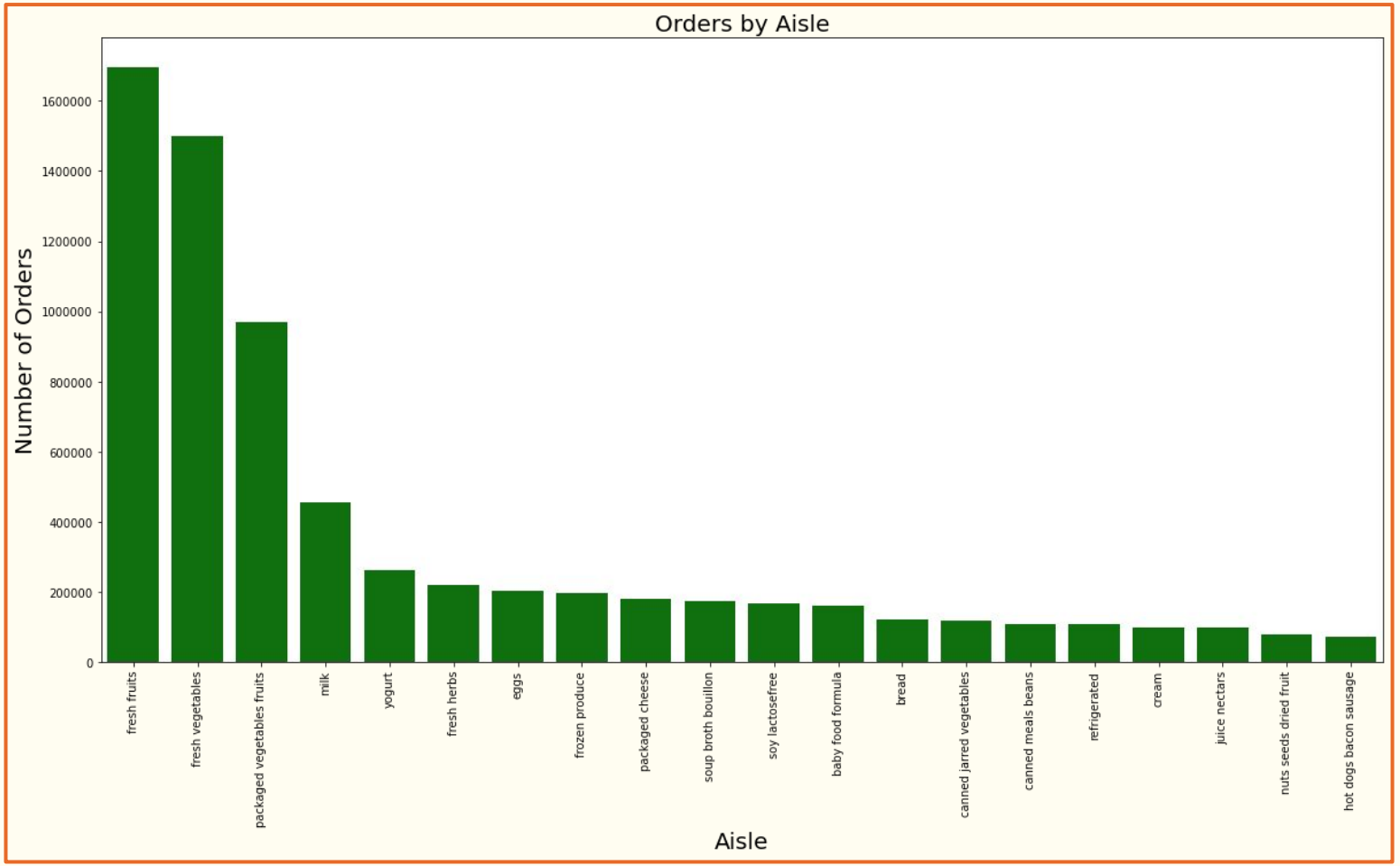

Reorders by Day of Week
Reorders
1750000
1500000
1250000
1000000
750000
500000
250000
0
0
1
2
3
4
5
6
Day of Week

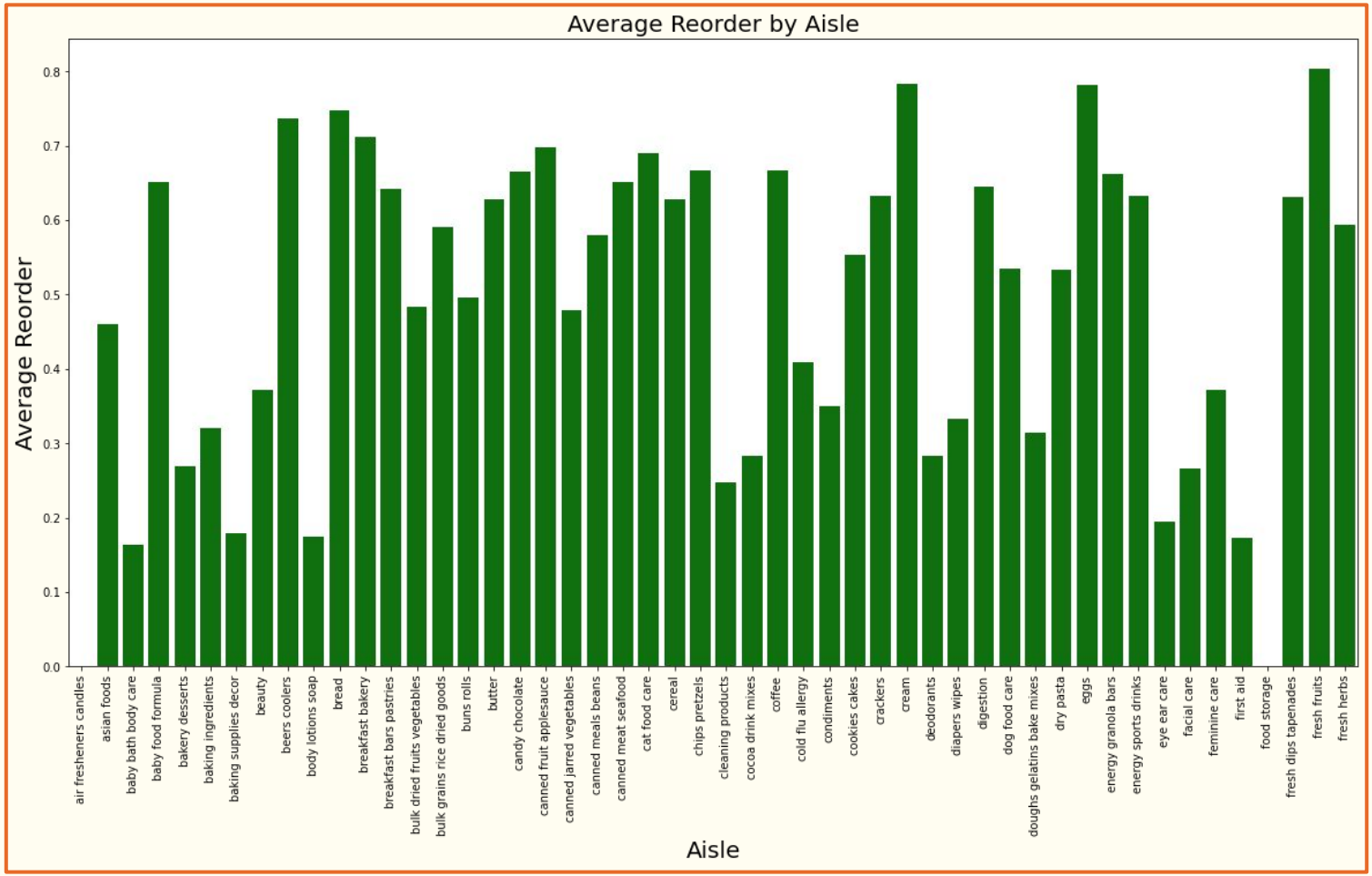

Purchasing Frequency by Hour of Day
Number of Purchases
0
100000
200000
300000
400000
500000
600000
700000
Hour of Day
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23


Reorders by Hour of Day
Reorders
0
100000
200000
300000
400000
500000
600000
700000
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Hour of day


Number of Orders by Department
Number of Purchases
4000000
3000000
2000000
1000000
0
produce
dairy eggs
canned goods
snacks
frozen
pantry
beverages
dry goods pasta
bakery
babies
Department


Average Reorder by Department
Average Reorder
0.8
0.7
0.6
0.5
0.4
0.3
0.2
alcohol
babies
bakery
beverages
breakfast
bulk
canned goods
dairy eggs
deli
dry goods pasta
frozen
household
international
meat seafood
missing
other
pantry
personal care
pets
produce
snacks
Department


Orders by Aisle
Number of Orders
0
200000
400000
600000
800000
1000000
1200000
1400000
1600000
fresh fruits
fresh vegetables
packaged vegetables fruits
milk
yogurt
fresh herbs
eggs
frozen produce
packaged cheese
soup broth bouillon
soy lactosefree
baby food formula
bread
canned jarred vegetables
canned meals beans
refrigerated
cream
juice nectars
nuts seeds dried fruit
hot dogs bacon sausage
Aisle


Average Reorder by Aisle
Average Reorder
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
air fresheners candles
asian foods
baby bath body care
baby food formula
bakery desserts
baking ingredients
baking supplies decor
beauty
beers coolers
body lotions soap
bread
breakfast bakery
breakfast bars pastries
bulk dried fruits vegetables
bulk grains rice dried goods
buns rolls
butter
candy chocolate
canned fruit applesauce
canned jarred vegetables
canned meals beans
canned meat seafood
cat food care
cereal
chips pretzels
cleaning products
cocoa drink mixes
coffee
cold flu allergy
condiments
cookies cakes
crackers
cream
deodorants
diapers wipes
digestion
dog food care
doughs gelatins bake mixes
dry pasta
eggs
energy granola bars
energy sports drinks
eye ear care
facial care
feminine care
first aid
food storage
fresh dips tapenades
fresh fruits
fresh herbs
Aisle