



No More Cookies in the Cookie Jar

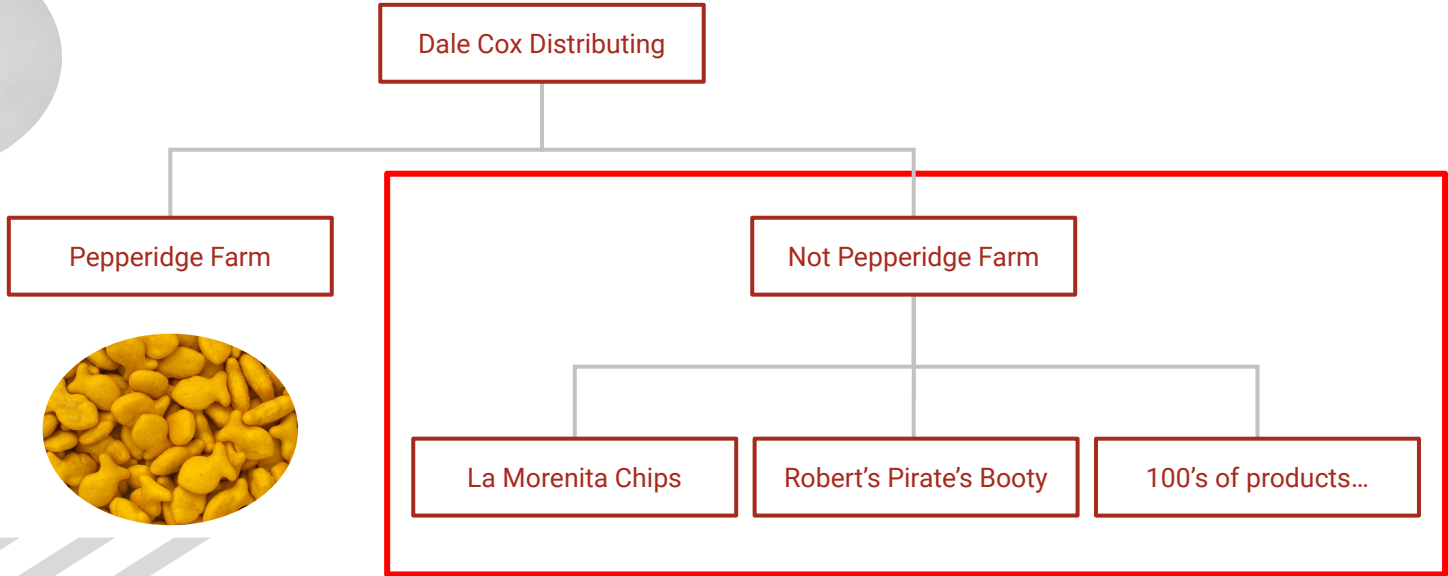
Nate Cox | Data Scientist | 2022-3-16



Outline

- ❏ Explain the business
- ❏ Problem
- ❏ Data Exploration
- ❏ Model
- ❏ Recommendations

Product Lines





Problem Statement

The Pepperidge Farm franchise has been having supply issues. Less product to distribute has caused the profits of Dale Cox Distributing to decrease.

How can these lost profits be recovered?

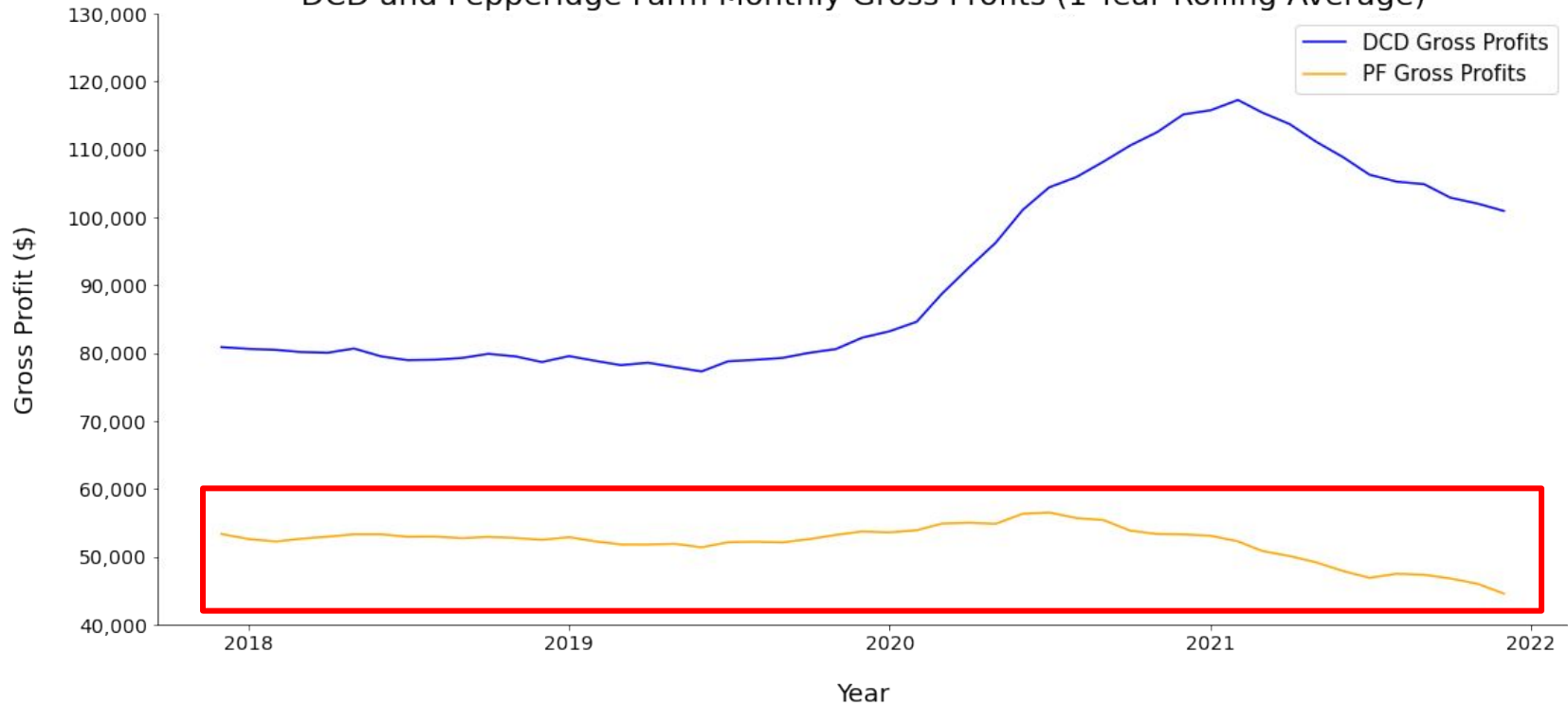


Data

- ❑ Profits and Products
- ❑ 5 Years of Monthly Data
- ❑ 266 Stores
- ❑ 7 Territories in SF Bay Area, CA
- ❑ 52 Product Types
- ❑ 2,072 Unique Products

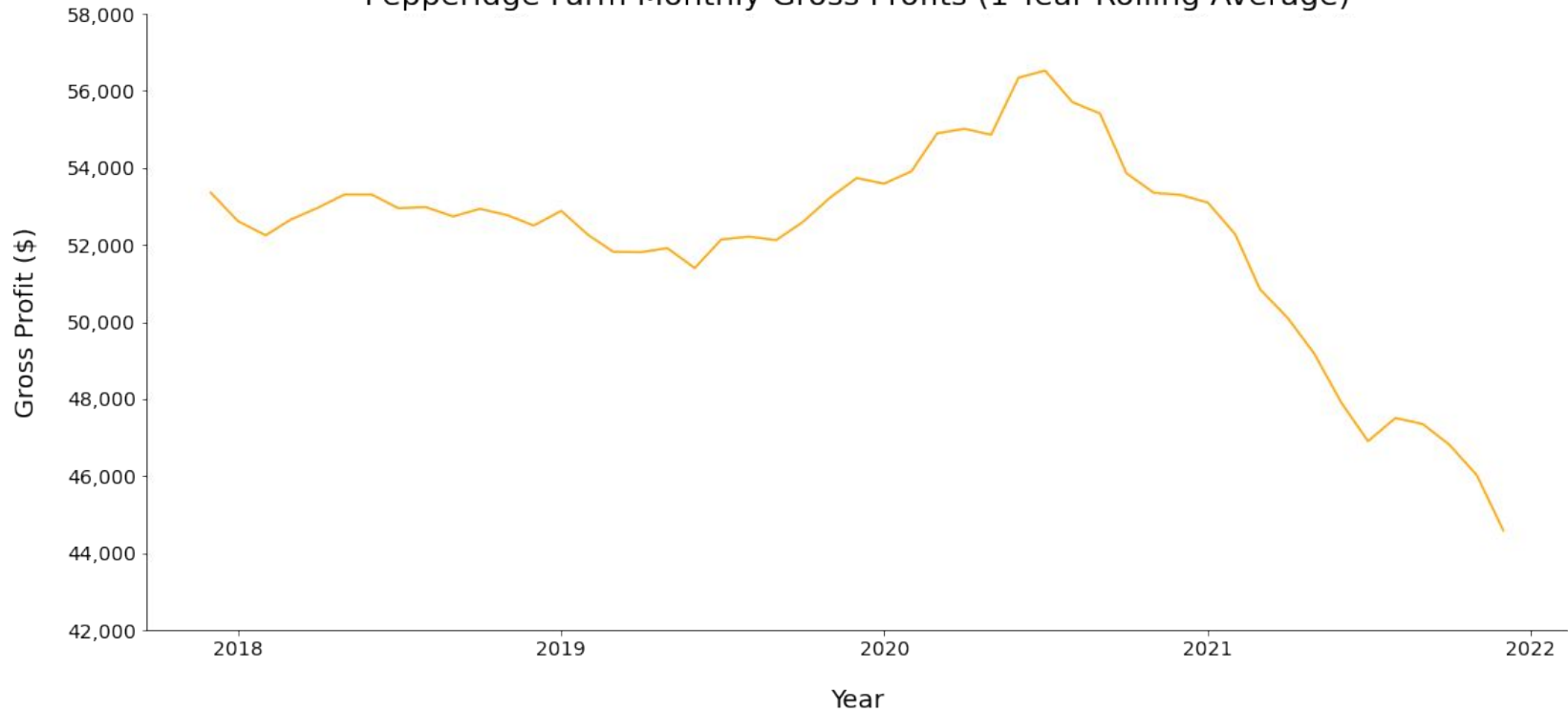


DCD and Pepperidge Farm Monthly Gross Profits (1 Year Rolling Average)



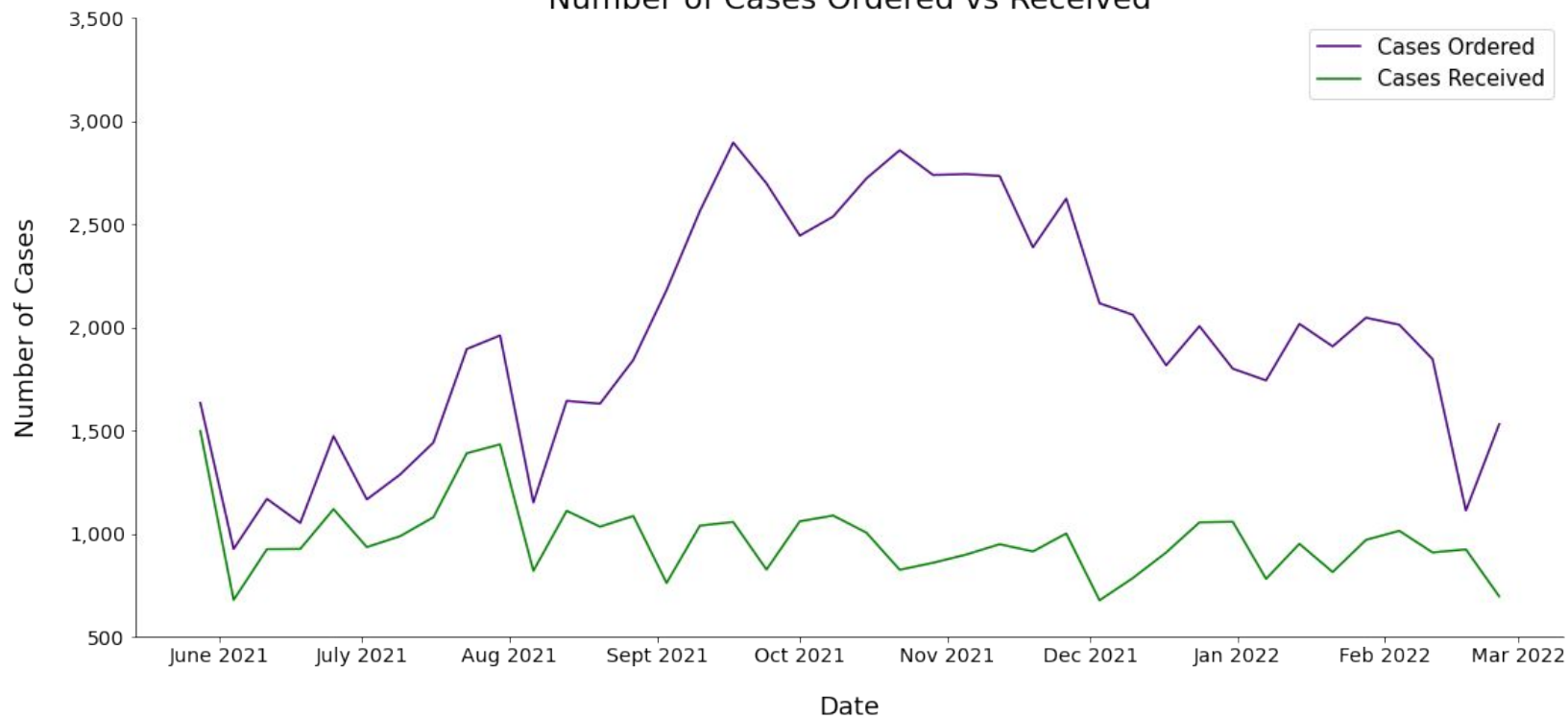


Pepperidge Farm Monthly Gross Profits (1 Year Rolling Average)





Number of Cases Ordered vs Received





Lost Profits

	Ordered	Received	Difference
Cases	78,000	38,000	40,000
Value	\$3.4 million	\$1.6 million	\$1.8 million

Note: 10 months of weekly orders

\$350,000
in lost profits



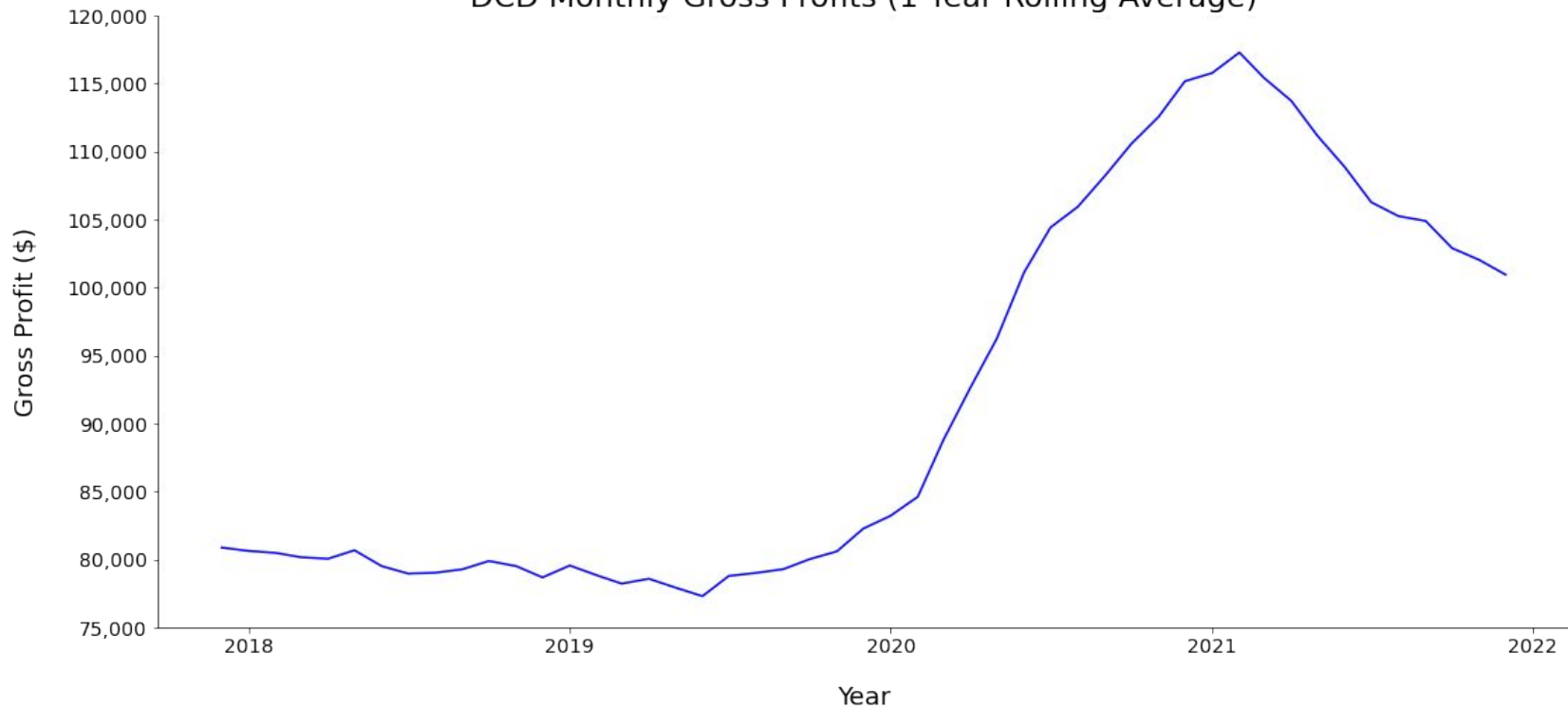
Closer Look at



DCD

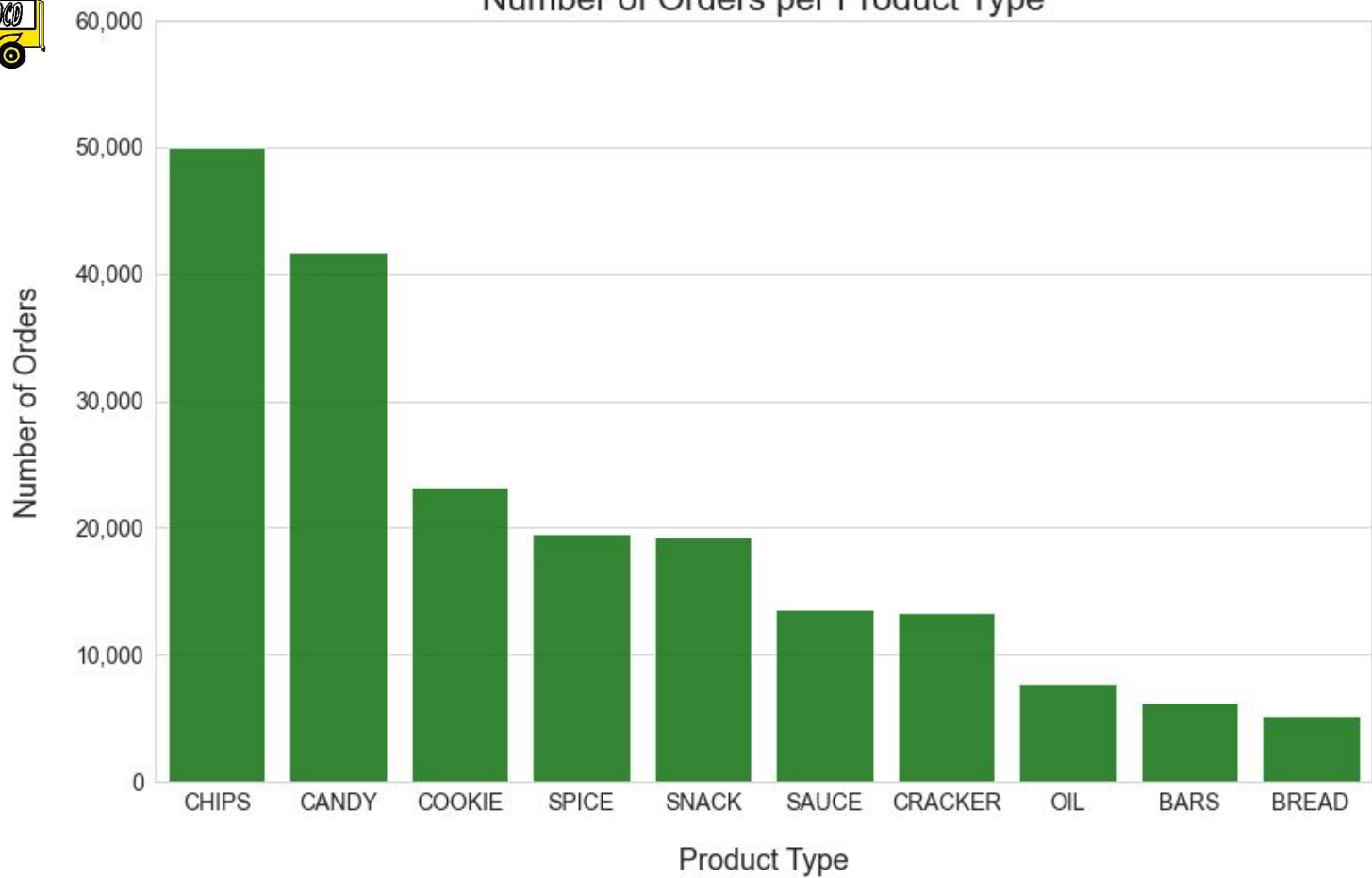


DCD Monthly Gross Profits (1 Year Rolling Average)



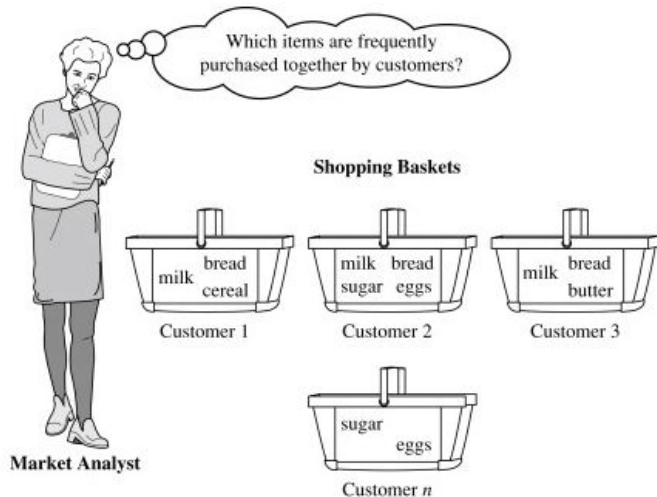


Number of Orders per Product Type





Market Basket Analysis



- ❑ No significant findings
- ❑ Threshold to identify relationship had to be set low
- ❑ Lot of noise in the data because of different flavors for each item

RFM

R = Recency

- ❑ How many months ago was the last order

F = Frequency

- ❑ How many months did the store place an order (5 years of data)

M = Monetary

- ❑ Total amount the store spent in the 5 years of data

Store Name	Recency	Frequency	Monetary
17th & Balboa Market	59	1	\$75
17th & Cole Market	5	44	\$3,000
25th & Clement Produce	0	58	\$12,900
300 Church St. Market	0	60	\$13,200
3rd Ave Food Market	54	5	\$750



K-means Clustering

Clusters



Focus

- ❏ Top 2 clusters of stores
- ❏ Controlled products
 - Private Labels
 - Only Distributor
- ❏ Top selling products



Controlled Products

- ❑ Casa Linda Enchilada Sauce
- ❑ San Francisco Flatbread
- ❑ Bertolino Olive Oil
- ❑ Asti Olive Oil
- ❑ Longitude Pasta Sauce
- ❑ La Morenita Tortilla Chips
- ❑ Baker's Delight Crumpets
- ❑ No other distributors
- ❑ All stores are fair game



Top Products

- ❑ Have'a Chips
- ❑ Robert's Pirate Booty
- ❑ Benzel
- ❑ Wiley Wallaby
- ❑ Sonoma Ranches
- ❑ Barbara's Cheese Puffs
- ❑ Andy's Rub
- ❑ Off the Farm

- ❑ Other distributors sell these
- ❑ Have to check in the stores



Model

- ❑ XGBoost Regressor
- ❑ Features:
 - Recency
 - Frequency
 - Monetary Value
- ❑ Target: Quantity

Trained on stores that ordered a product



Predicted the quantity for stores that were not ordering a product



Repeated for each product



Results

Product	Baseline RMSE	RMSE
La Morenita	168	86
Baker's Delight	34	22
SF Flatbread	23	16
Casa Linda	15	13
Asti	15	12
Longitude	14	10
Bertolino	11	8



Predictions

Store Name	Territory	Recency	Frequency	Monetary	Predicted Quantity
Monterey Foods Market	EB	0	60	\$119,000	368
Stinson Beach Market	MR	0	60	\$133,000	368
Bianchini's Mkt - Alpine Rd.	PN	0	60	\$86,000	284
The Tides Bait & Tackle	MN	0	59	\$25,000	74
Guigni's Deli	NP	9	50	\$17,000	73



Note: Predictions for La Morenita Chips

Potential Profits

- ❑ 15 products
- ❑ Top 3 predicted stores for each
- ❑ **\$26,000** or **2.2%** increase in profits for 2021





Deliverables



- Provided an Excel workbook with store recommendations
 - Sheet for each product label
 - Each sheet has stores ordered based on best target
- [Tableau Dashboard](#)



Recommendations

- ❑ Upgrade database, systems, and software
- ❑ Push products from the 7 controlled labels to the recommended stores



Next Steps

- ❏ Explore more of the company's data
- ❏ Look into locations of stores
 - Cost of distributing vs profits

Questions?

