Instacart

Market Basket Analysis

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BUSINESS OBJECTIVES

- Describe any purchasing patterns
- Identify the complementary products
- Identify the substitute products
- Select products requiring increased offerings

DATASETS

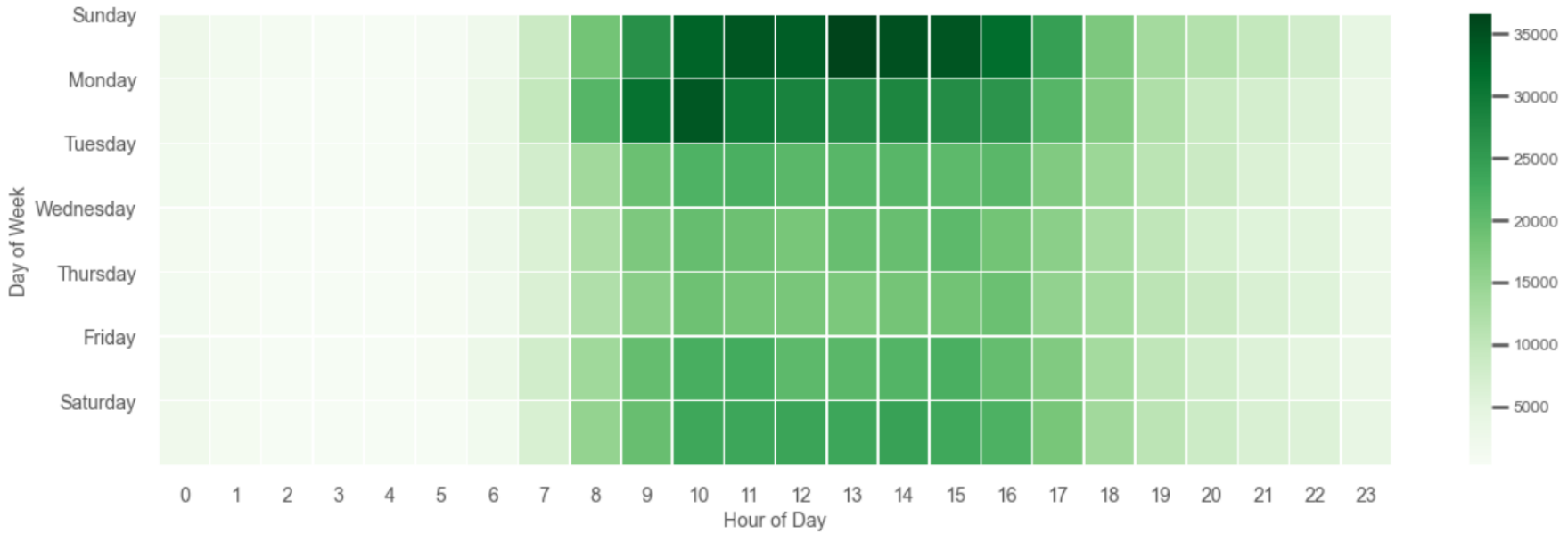
- **4 datasets** : orders, order_products, departments and products
- Merged dataframe resulted in 2019501 records and 12 features
- 134 products previously grouped for computational capacity
- 21 departments of varying sizes

DATA INSIGHTS

Most Frequent Time:
9 am to 4 pm

Most Popular Days:
Sunday
Monday

Period with Largest Number of Orders:
Sunday at 1 pm



75% of orders

↓

< 14 products

Most Frequent Number of Products:
4 to 7

DATA INSIGHTS

Reordered products:
63%

Reorder Rate by user:
- Between **60%** and **80%** → 25% of users
- **100%** → 11% of users
- **0%** → 5.6% of users

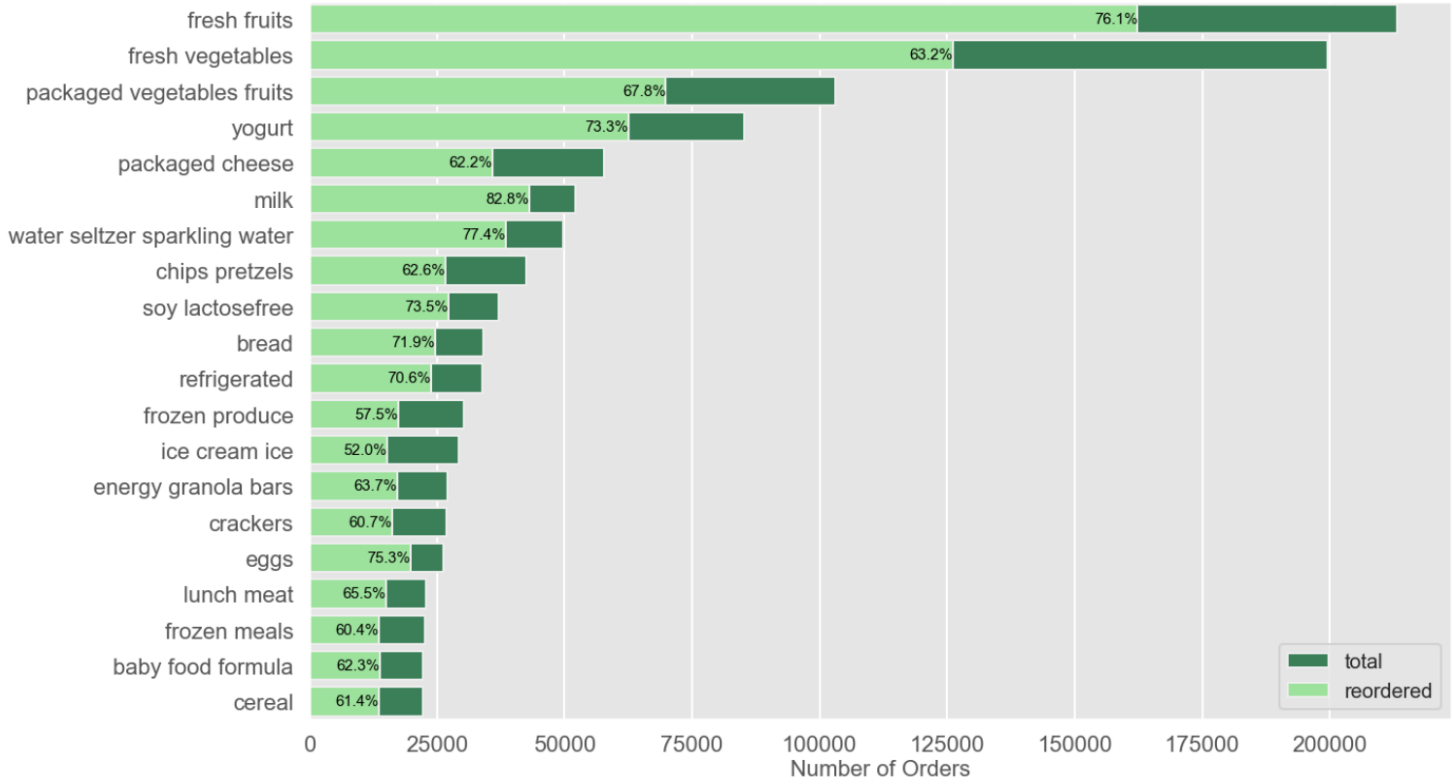
Reorder Rate by order:
- **100%** → 23% of orders
- **0%** → 6% of orders

- **Top Products Sold:**

1. Fresh fruits
2. Fresh vegetables
3. Packaged Vegetables Fruits

- **Top Products Reordered:**

1. Milk
2. Water Seltzer Sparkling Water
3. Fresh Fruits
4. Eggs



APRIORI ALGORITHM

Market Basket Analysis

1. Select Frequent Item Sets

Support > 3% (= 60 555 orders)

62 products out of 134
397 sets (from 1 to 5 products)

2. Generate the association rules
3. Establish relationships between products

Support
Frequency

$$\frac{A \cap C}{U}$$

Conf.
Strength

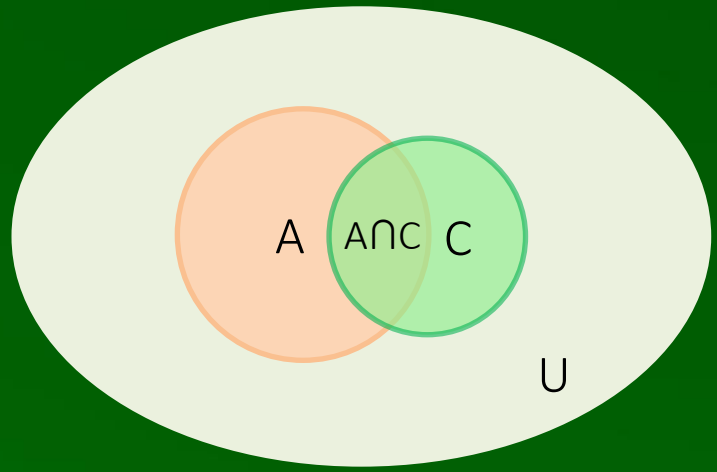
$$\frac{A \cap C}{A}$$

Expected Conf.

$$\frac{C}{U}$$

Lift
Likelihood of consequent increases given an antecedent

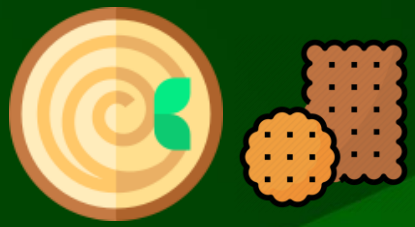
$$\frac{Conf.}{Expected\ Conf.}$$



RESULTS

Complementary Products

Chips pretzels



Fresh dips tapenades

Crackers

Packaged cheese

Lunch meat

Hot dogs bacon sausage

Bread

Cream cheese

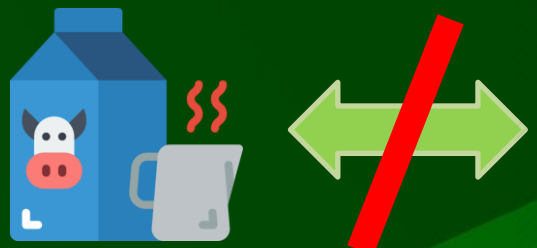
Crackers

26% < Confidence < 43%

Lift > 1.5

RESULTS

Substitute Products



Milk

Soy
Lactose free

Sparkling
water

24% <

Confidence

< 25%

Lift < 1

DEPLOYMENT

- ✓ *Suggestion of products (complementary products)*
- ✓ *Out of Stock pop-up (substitute products)*
- ✓ *Higher variety of yogurt and packaged vegetable fruits*
- ✓ *Bundles to increase popularity of lower selling products*

Thank you!
Any questions?