

Walmart analysis

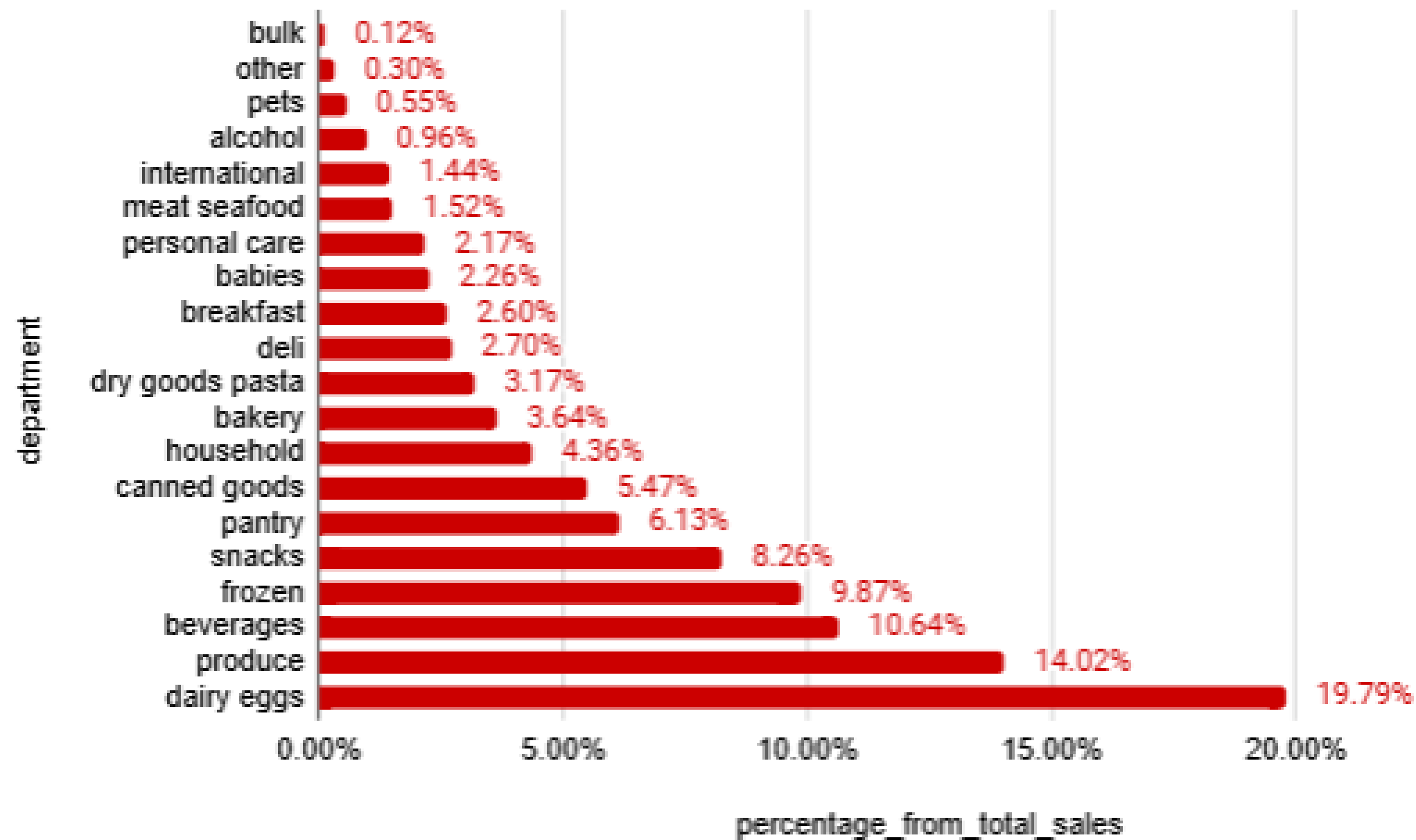
Team Members:

1. Yossr Yasser
2. Arwa khaled
3. Maya Gamaleldin
4. Nada Maher
5. Rawan Saudi



Department sales

percentage_from_total_sales vs. department



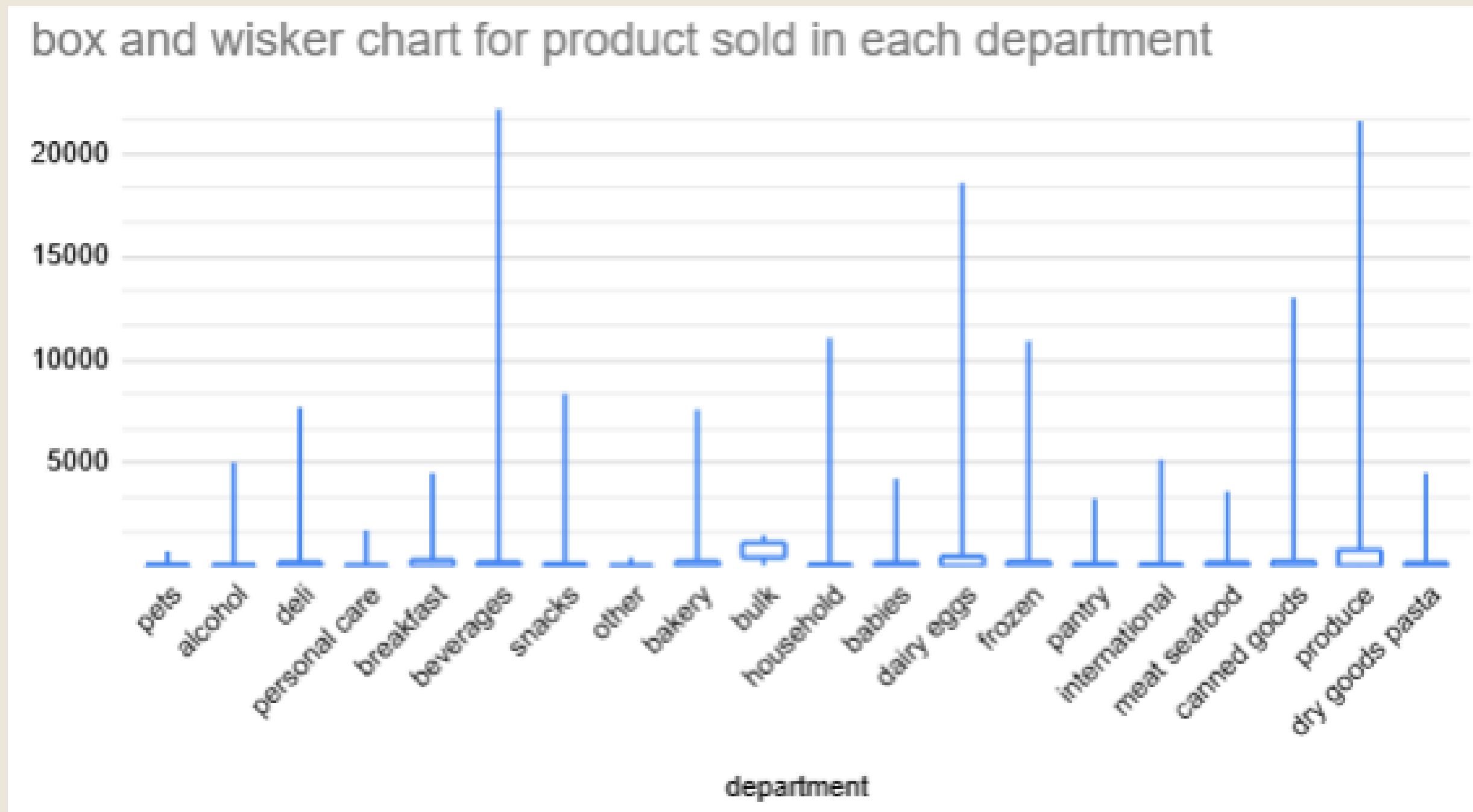
the dairy eggs, produce ,beverages, and frozen department accountants for **54% of total products** sold while other department aren't doing good enough such as the bulk ,others and pets department which only accounts for less than **1% of total units sold**

"Department sales"

recommendations:

- **Pets** :to increase the pets department sells send discount and vouchers to your customers that buy pets food and products to encourage them to buy more
- **bulk** : if you look at the graph in you will realize that the majority of our customers buy their products monthly (day since last order equal to 30) which mean that they spend 30 days till they return and when they return they buy groceries at bulk so that they can last them for 30 days till there next return you can send those customers at day 28 information about products in your bulk department to insure they will buy from them when they come

product sales in each department



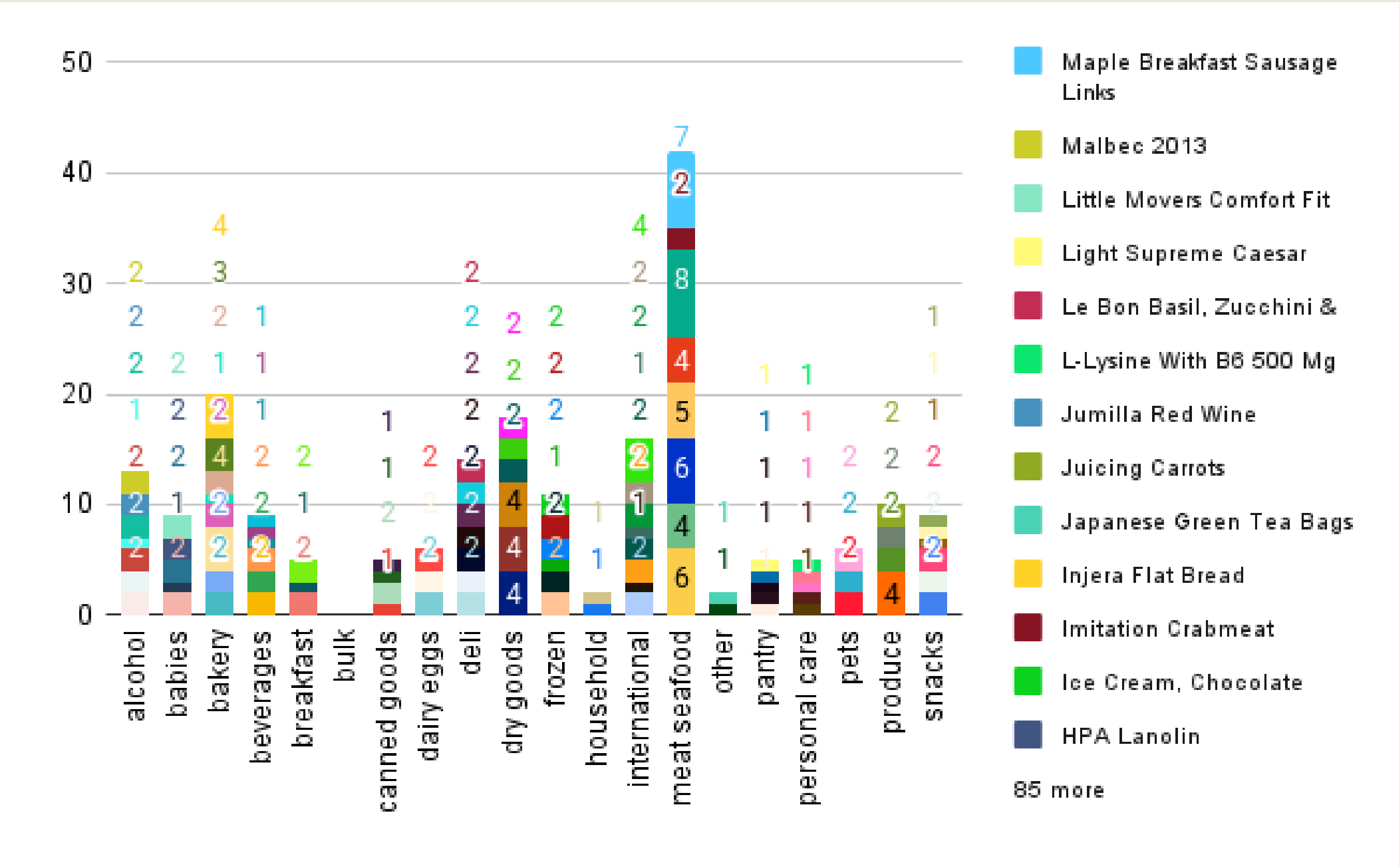
Our box-and-whisker plots show a strong right skew for many departments, indicating that most products in those departments are not purchased frequently. However, a small number of products are purchased at a much higher rate.

product sales in each department

recommendations :

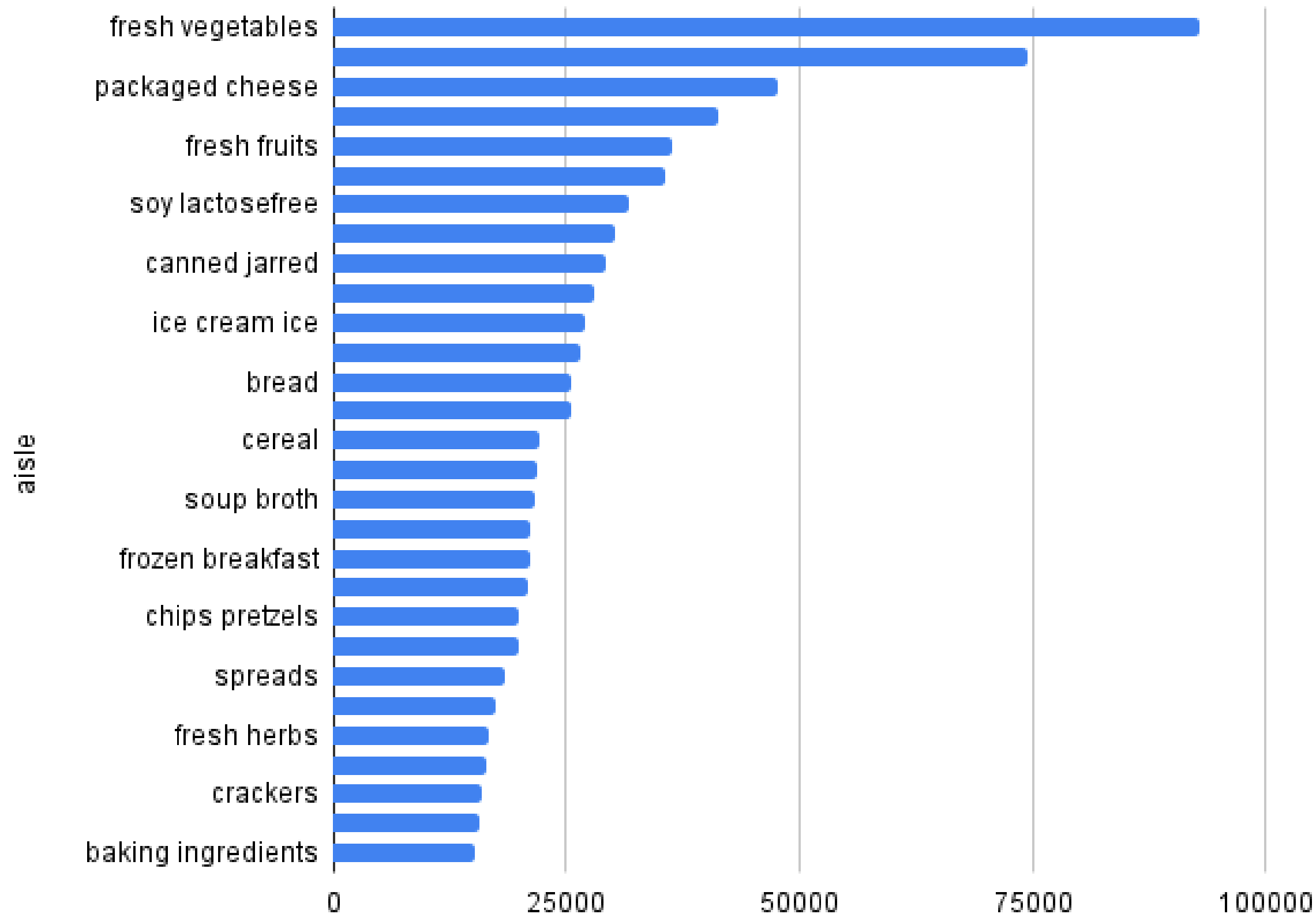
- 1) we should stop selling products that aren't purchased a lot
- 2) try to cross sell products with low purchase rate with products with high purchase rate
- 3) change aisle of low selling products so that they can be more visible or place them near products with high purchase rate

least 10 selling products in department



We can limit orders for these products since they don't sell well, or we can cross-sell them with high-selling products or offer discounts to help them sell faster

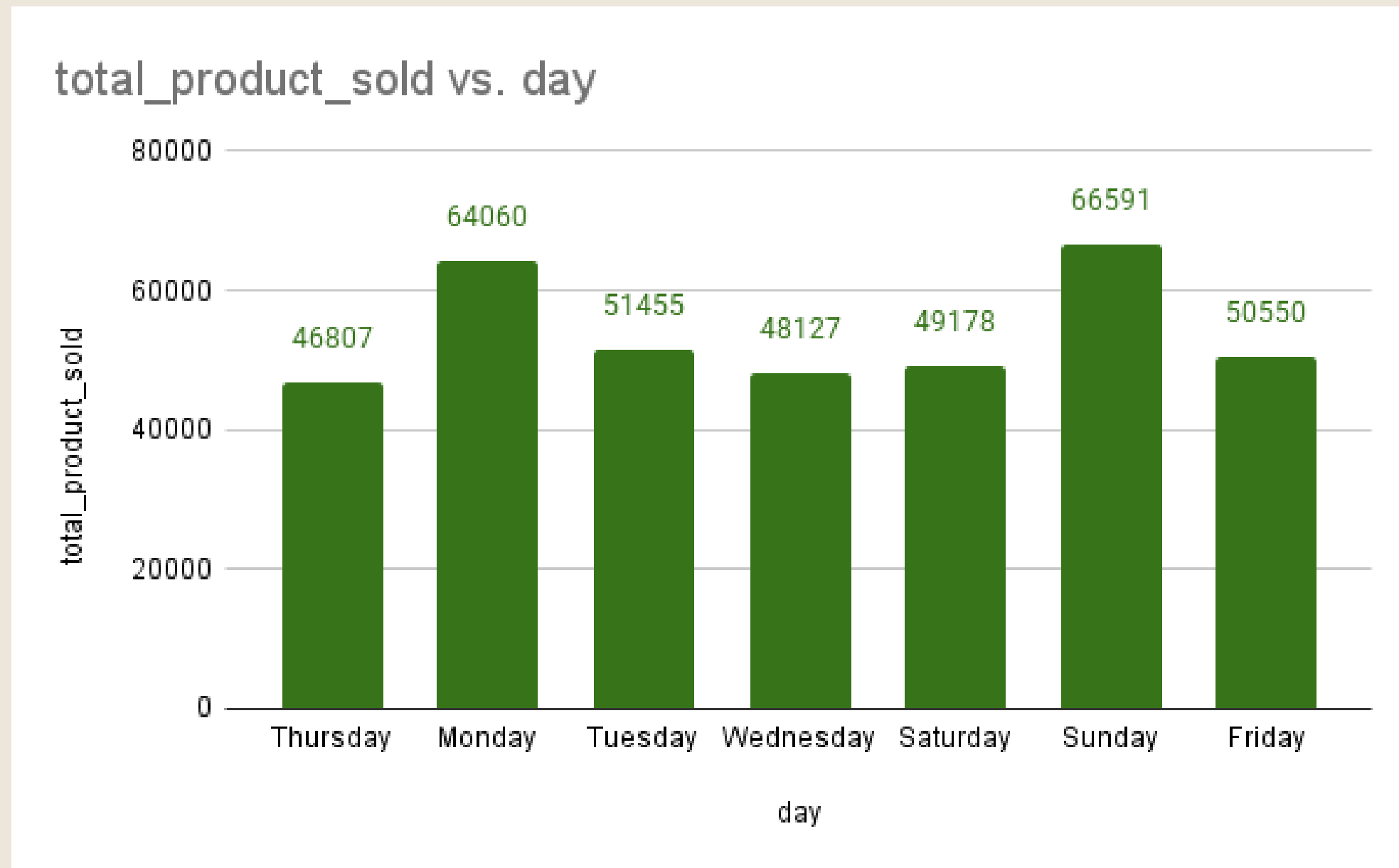
Aisle with maximum total product sold



Recommendations:

- Invest more in marketing for aisles and departments with high sales volume.
- Identify underperforming aisles and evaluate product offerings or placement strategies.
- Reallocate shelf space based on sales performance to improve efficiency.

products sold vs day of week

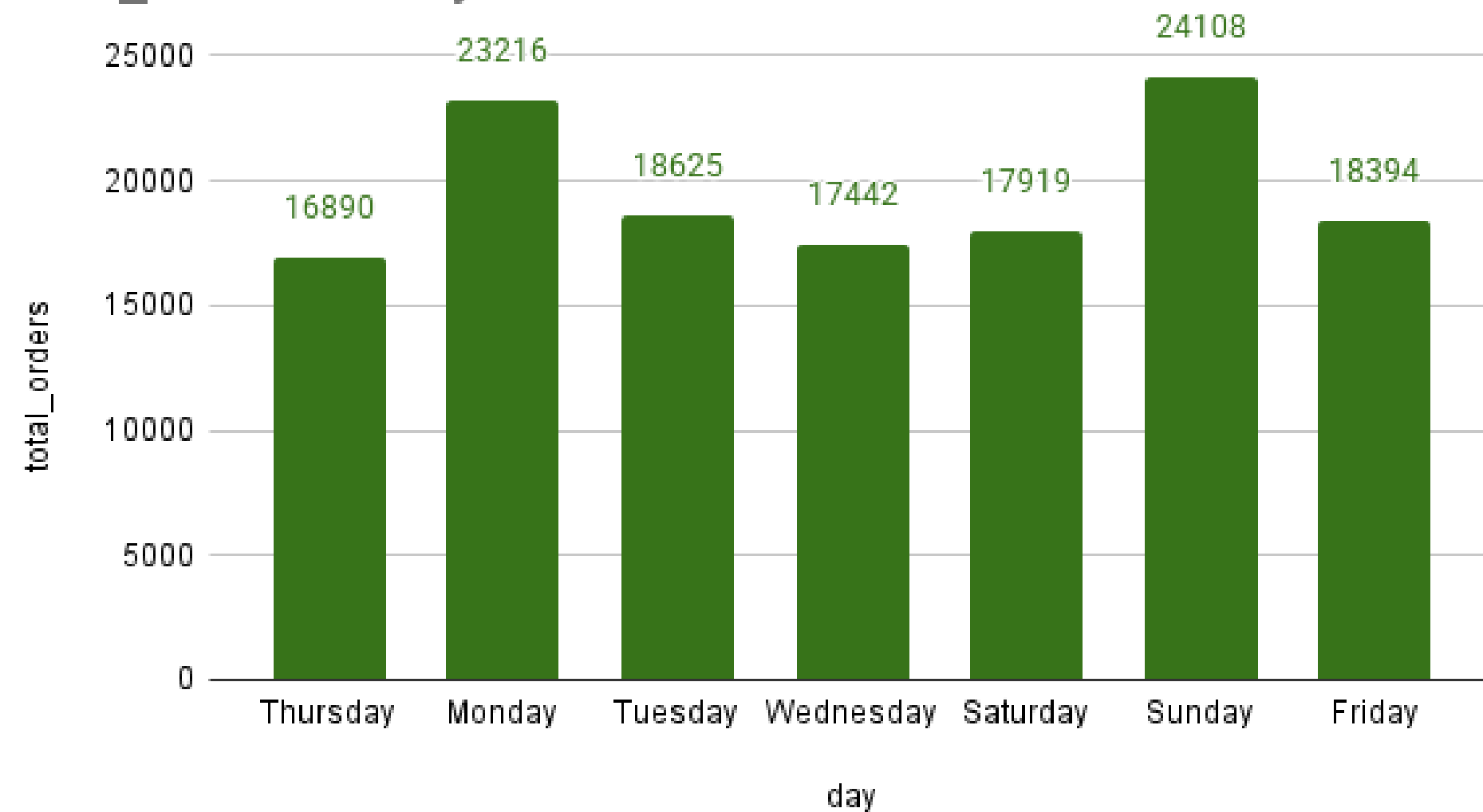


Recommendations:

- **Targeted Promotions:** Offer special discounts or bundles for these days to encourage more sales. For example, promoting "Sunday-Monday Deals" or "Weekend to Monday Specials" could drive even more traffic.
- **Optimizing Staff & Operations:** Knowing these are high-demand days can help you schedule more staff or prepare your operations for increased activity, ensuring smooth service.

orders vs day of week

total_orders vs. day

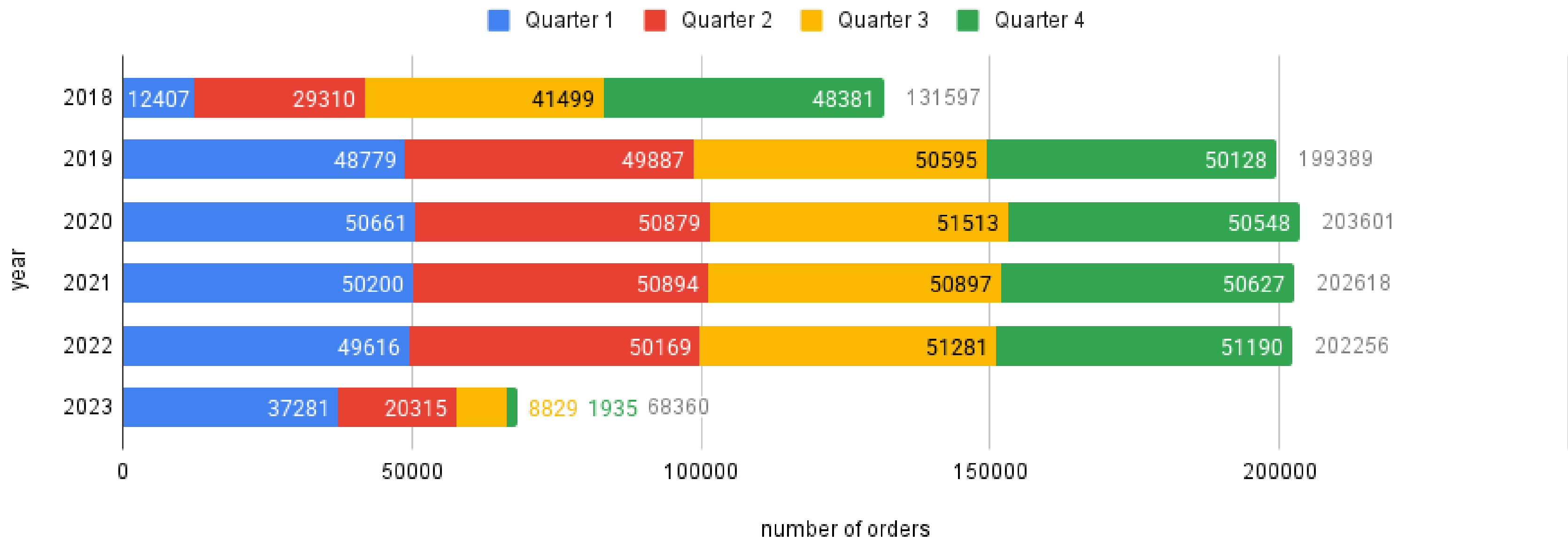


Recommendations:

- **Increase Stock & Prepare for Demand:** You can ensure that popular products are well-stocked ahead of these days, preventing out-of-stock situations and capitalizing on higher demand.
- **Optimizing Staff & Operations:** Knowing these are high-demand days can help you schedule more staff or prepare your operations for increased activity, ensuring smooth service.

order per each quarter

total orders each quarter in each year



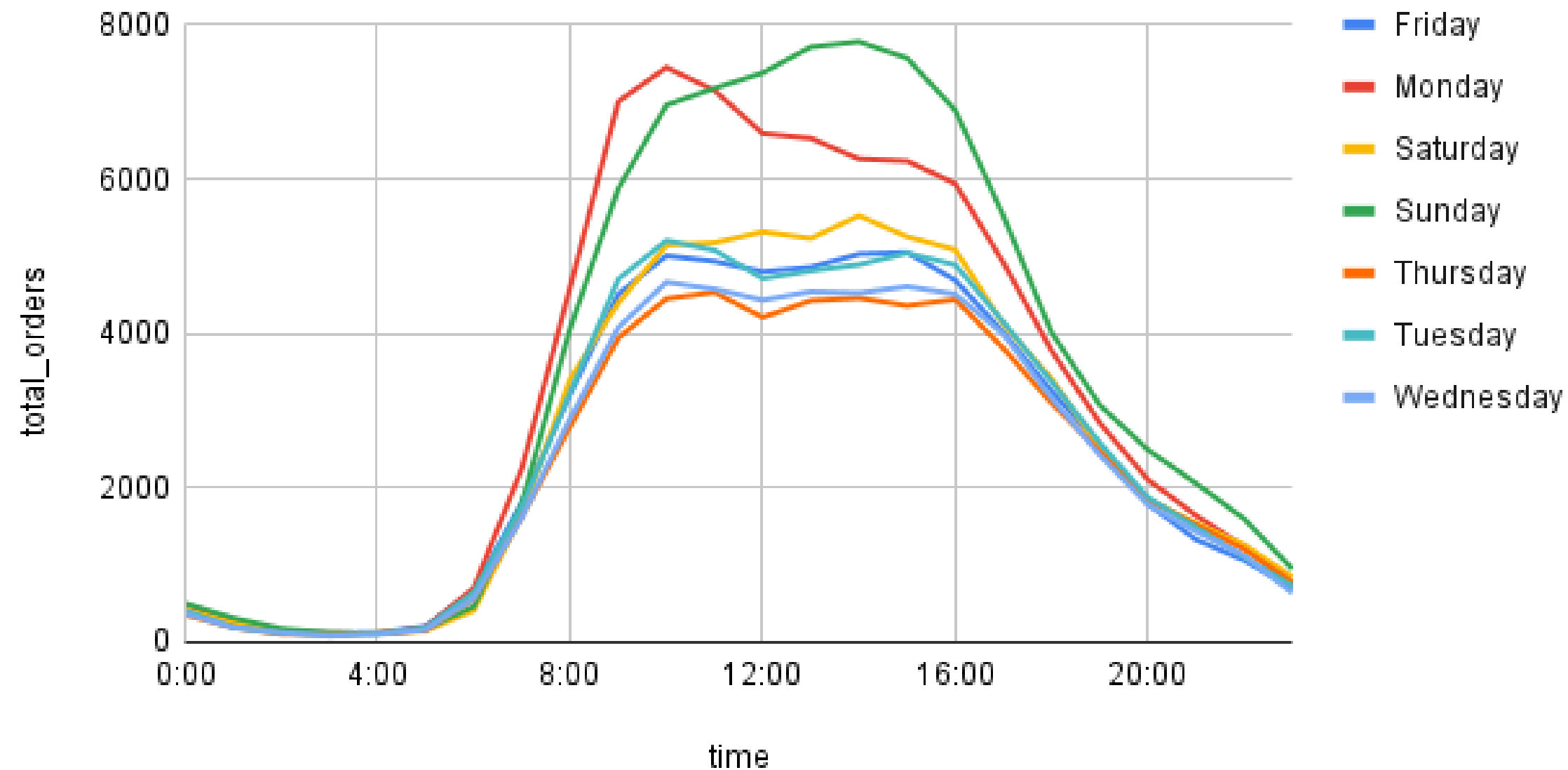
order per each quarter

as you can see in majority of years we have low sells in Quarter one and this is expected since After the holiday season

- customers tend to spend less in January and February due to higher post-holiday debt, tighter budgets, or simply less enthusiasm for shopping.
- If you don't run major sales, discounts, or campaigns early in the year, customers may not be as motivated to buy. (Many businesses offer New Year or post-holiday sales to boost sales)

number of orders in each time of day

Time VS number of orders in each day

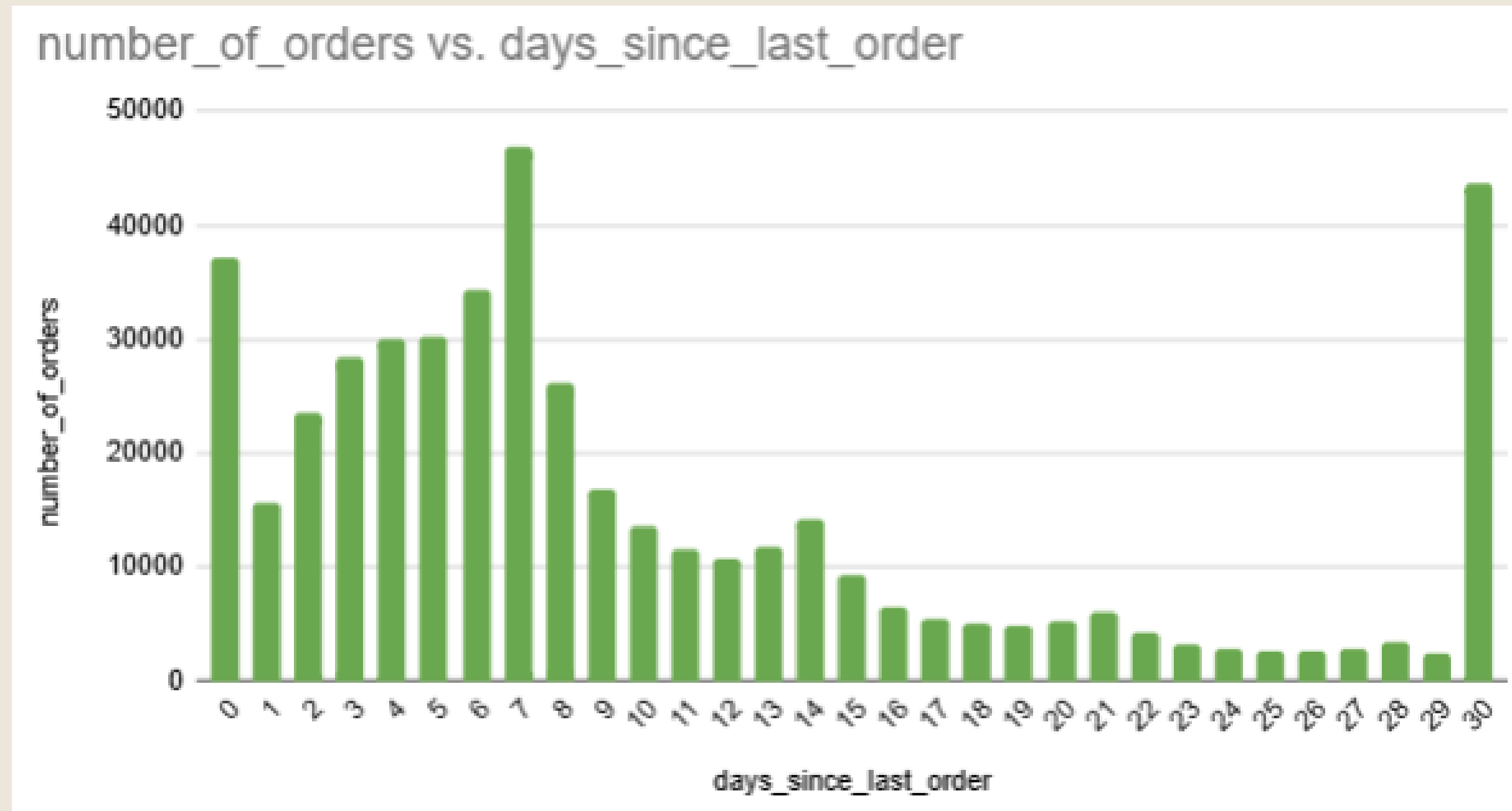


number of orders in each time of day

Recommendations:

- Schedule promotions during peak(such as weekends) buying times to maximize impact.
- Use data to optimize staff scheduling and ensure high-traffic periods are wellcovered.
- Offer loyalty rewards to re-engage customers with longer gaps in purchase
- As shown in the graph, we have a low purchase rate from 4 to 8 AM. We can increase the number of orders during this time by offering promotions in this time for breakfast products.

days since last order



days since last order

This visualization shows the number of days after which a customer returns for a order. Most orders are repeated either after 30 days or after 7 days i.e. most customers shop monthly or weekly

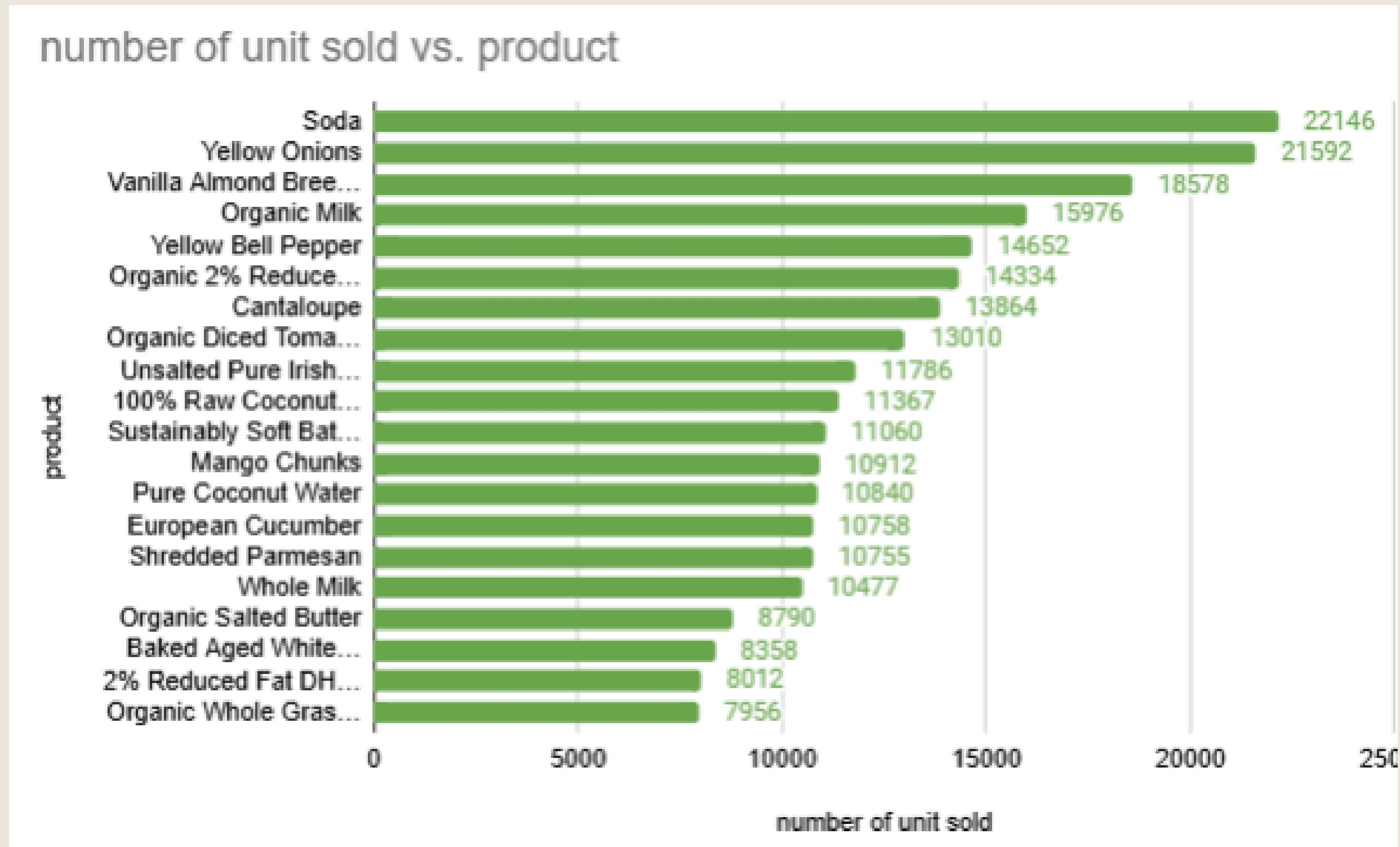
recommendation with monthly customers

- Subscriptions: Offer subscription options where customers automatically receive their products each month, adding convenience and ensuring repeat purchases.

recommendation with weekly customers

- Implement subscription services, weekly promotions, loyalty rewards, or regular customer engagement.

Top 20 selling products

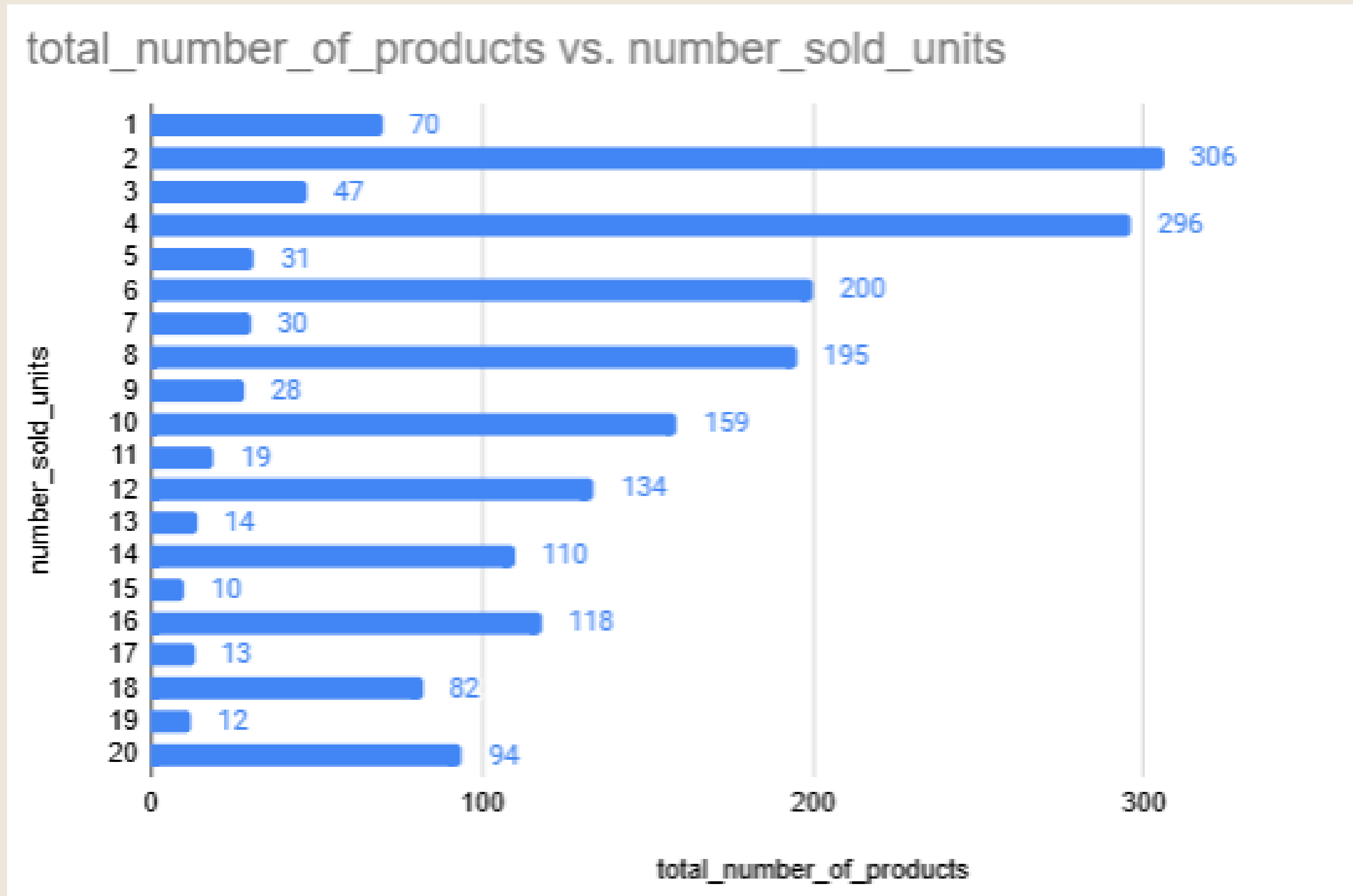


Top 20 selling products

Top-selling products indicate high demand, and we can leverage this demand to increase revenue ($\text{Revenue} = \text{Price} * \text{Quantity}$) in two ways.

- **For elastic products** (those whose demand decreases when the price increases), we can boost the total quantity sold by offering promotions or encouraging bulk purchases.
- **For inelastic products**, such as dairy products that we produce and sell, we can increase the price without significantly affecting demand.

least selling products

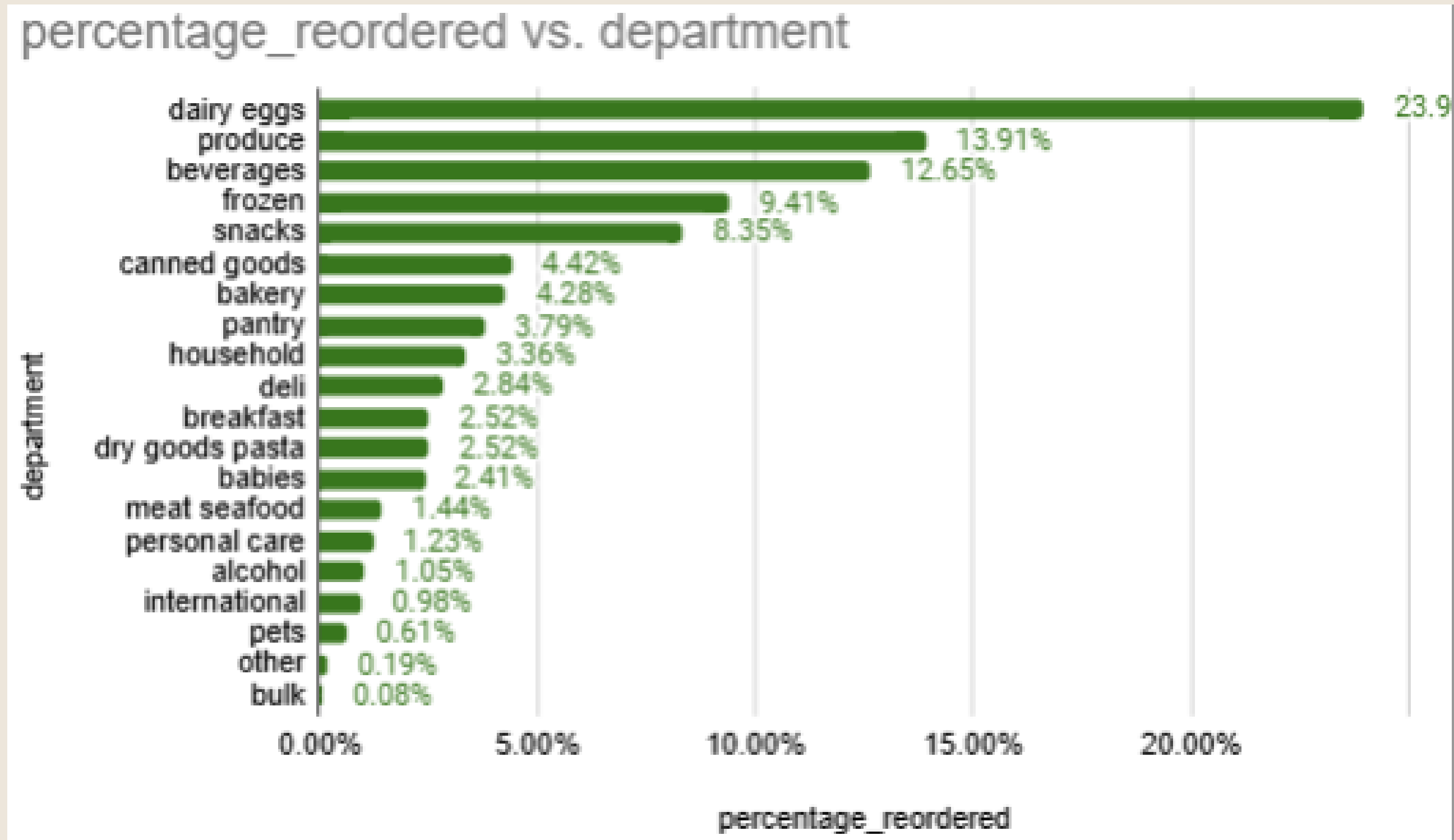


least selling products

There are 70 products that were only bought once and 306 products that were only bought 2 times yet we still offer those products even though they have low selling rate

The best option is to stop selling them

Percentage of reordered from each department



Percentage of reordered from each department

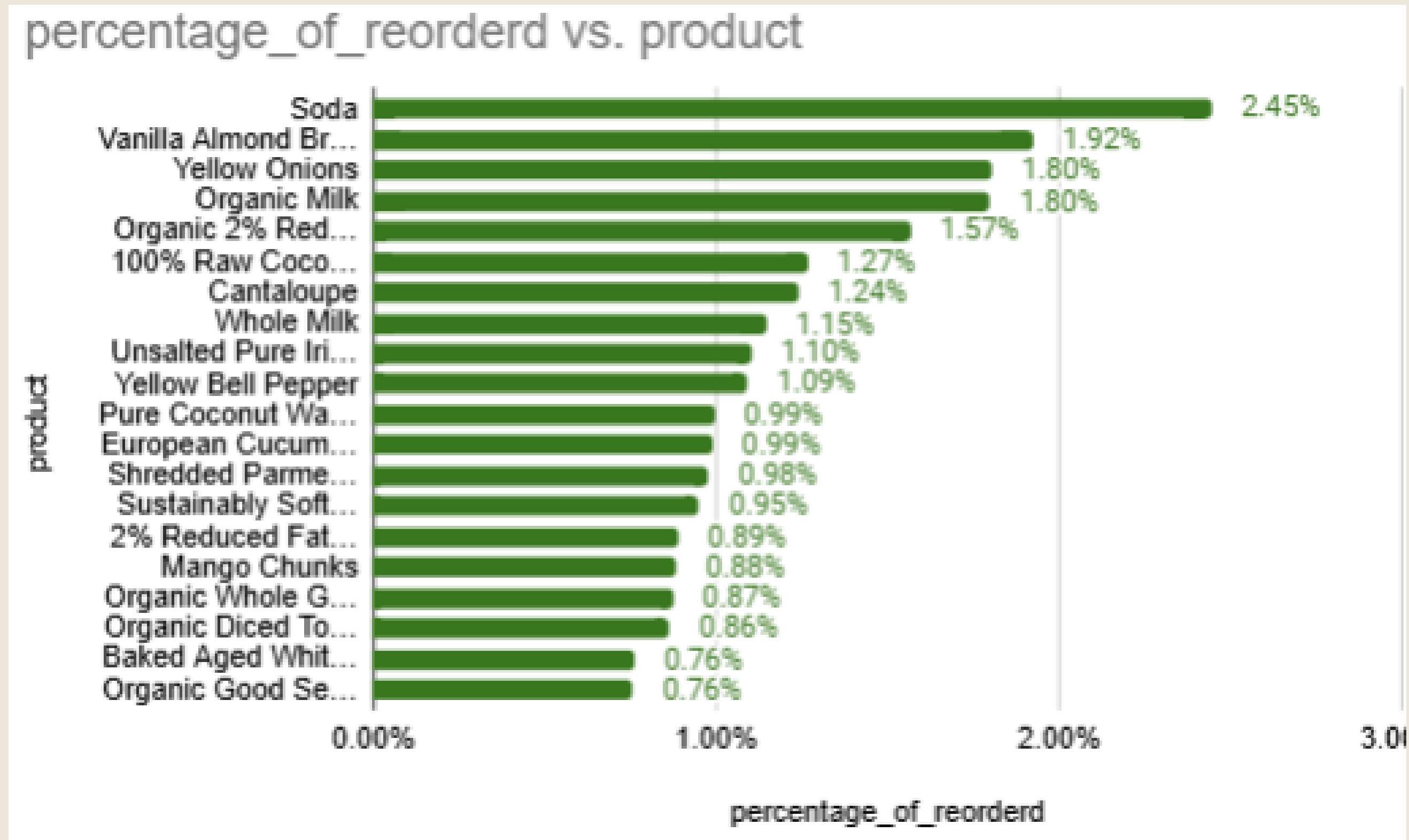
Re-Order means whether a product is purchased in the past by a given customer or not.

Produce and dairy eggs are the departments with highest number of re-orders

They both combine to account for approximately 50% of total re-orders.

This is intuitive since both these departments contain food consumables that are used by people on daily basis.

Top 10 re-ordered products



Top 10 re-ordered products

In this graph we have the most reordered products we need to

- Highlight these products in promotions, marketing campaigns or create premium shelf space
- Make sure they are never out of stock especially in days busy days
- Use them in an bundle offer with product that have low selling rate for example Vanilla Almond Breeze Almond Milk can be sold with a creamer that has low low selling rate

Products with High Association

Our Results :

PRODUCT_A	PRODUCT_B	LIFT
0% Fat Blueberry Greek Yogurt	0% Fat Superfruits Greek Yogurt	2339.09939019561
Sweet Potato, White Beans & Cinnamon Stage 2	Organic Stage 2 Apple Oatmeal With Cinnamon Baby Food	1608.00348432056
Organic Vitality Snack Chia Squeeze Strawberry Banana	Green Magic Chia Squeeze	1515.49844816884
Kiwi Spinach Peas & Green Apple	Organic Creamies Strawberry, Raspberry & Carrot Freeze-Dried Fruit Snacks	1489.51373018558
Homestyle Savory Chicken Bone Broth	Turkey Cranberr Sage Bone Broth	1478.3856812933
Frozen Desserts, Fit, Salted Caramel	Frozen Desserts, Cookies and Cream	1431.29043052438
Salted Caramel Lean Protein & Fiber Bar	Lean Protein & Fiber Bar Honey Drizzle Peanut	1050.88948643411
Vanilla Bean Natural Lowfat Yogurt	Yogurt, Organic, Lowfat, Plain	980.675552979813
Chunky Classic Chicken Noodle Soup	Creamy Chicken & Dumplings Soup	974.779141914191
Organic Raw Pomegranate Kombucha	Super Tea Power Greens	917.546070208139
Pomegranate Blueberry Sparkling Water	Orange Mango Sparkling Water	747.210175250562
Organic Raspberry Yogurt	Whole Milk Yogurt	715.643052005858
To Go Creamy Peanut Butter Cups	Regular Cream Cheese Spread	650.428375680226
Pomegranate Blueberry Pistachio Plus Antioxidants Fruit & Nut Bar	Plus Cranberry Almond + Antioxidants with Macadamia Nuts Bar	612.240918035687
Berries GoMega Smoothie Blend	Mango Tango Fruit Smoothie Blend	486.476710369039

Products with High Association

Our Results :

PRODUCT_A	PRODUCT_B	LIFT
Root Veggie Burger	The \"World's Best\" Veggie Burger	475.557853862056
Chicken Apple Sausage Egg White Breakfast Burrito	Eggs, Cheese & Turkey Sausage Breakfast Burrito	450.95131558858
Energy Tropical Citrus Vitamin Water Drink	vitaminwater® XXX Acai Blueberry Pomegranate	406.482397133112
Mango Sparkling Water	Club & Cheddar Sandwich Crackers	399.495325484765
Coconut Pineapple Sparkling Water	Orange Mango Sparkling Water	390.279326693836
Wild Chanterelle Mushroom Ravioli	Basil, Asiago & Pine Nut Pesto Ravioli	363.177568622513
Wheat Sandwich Bread	Bag of Oranges	346.371704662726
The \"World's Best\" Veggie Burger	Hemp & Greens Burger	336.874492449473
Regular Cream Cheese Spread	Classic Roast	316.714618422878
Club & Cheddar Sandwich Crackers	Diet Dr.Pepper Soda Pack	275.751075525813
Lowfat Raspberry Kefir Probiotic Cultured Milk Smoothie	Low Fat Kefir Cultured Milk Smoothie Lowfat Probiotic Blueberry	275.419975771828
Kombucha Gingerade	Trilogy Kombucha	269.956789338488
First Prunes	Organic Stage 2 Pears Baby Food	232.185809313906
Mint Chip	Lemon Cake Ice Cream	207.371338996452
Organic Cashew Carrot Ginger Soup	Organic Roasted Red Pepper & Tomato Soup	203.754501623043

Products with High Association

Our Results :

PRODUCT_A	PRODUCT_B	LIFT
Peach-Pear Sparkling Water	Mango Sparkling Water	186.113335404835
Dry Pasta Lasagne	Whole Milk Ricotta Cheese	183.104720141769
Organic Raw Pomegranate Kombucha	Pink Lady Apple Kombucha	175.102086820667
Dark Red Kidney Beans	Garbanzo Beans	166.393267342319
Jumbo Grade A Eggs	Milk Whole	150.906425418279
Beyond Beef Beefy Crumble	Home Style Beefless Tips	139.653221106429
Stage 1 Just Butternut Squash Baby Food	Broccoli & Apple Stage 2 Baby Food	133.207954666044
Salted Caramel Lean Protein & Fiber Bar	Strawberry and Banana Fruit Puree	127.604957290278
California Merlot	Sauvignon Blanc	121.946935782564
Cherry Pomegranate Greek Yogurt	Nonfat Vanilla Fudge Swirl Frozen Yogurt	110.143533589819
Cabernet Sauvignon, Central Coast, 2011	Sauvignon Blanc	104.553451784104
Sparkling Orange Juice & Prickly Pear Beverage	Arancita Rossa	97.20901727418
Broccoli & Apple Stage 2 Baby Food	Organic Apple Raisin & Quinoa Stage 2 Baby Food	96.2562732640226
Regular	Diet Dr.Pepper Soda Pack	96.1676799477355