



Instacart Basket Analysis

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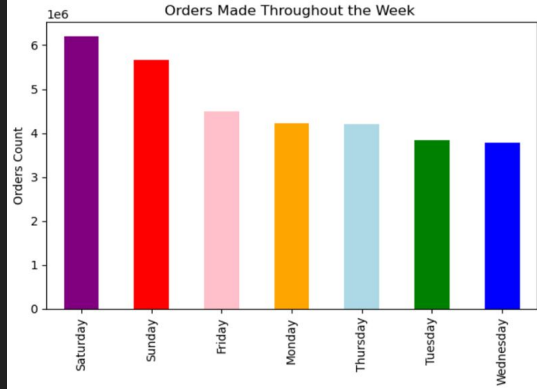
About Instacart Basket Analysis

- Instacart, an online grocery store, has great sales in the United States. They plan to uncover more info about their sales patterns.
- My task is to analyze the sales data in order to derive insights and suggest strategies to further improve profitability.
- The Customers Data Set, which contains users' names, age, income, etc., were created by CareerFoundry for learning purposes only. If my analysis is used publicly, customer names can instead be replaced by using their user ID number for privacy.
- The Instacart Data Set and Data Dictionary used were from Kaggle “The Instacart Online Grocery Shopping Dataset 2017”, Accessed from www.kaggle.com/datasets/instacart/instacart-online-grocery-shopping on March 2024.

Tools used:

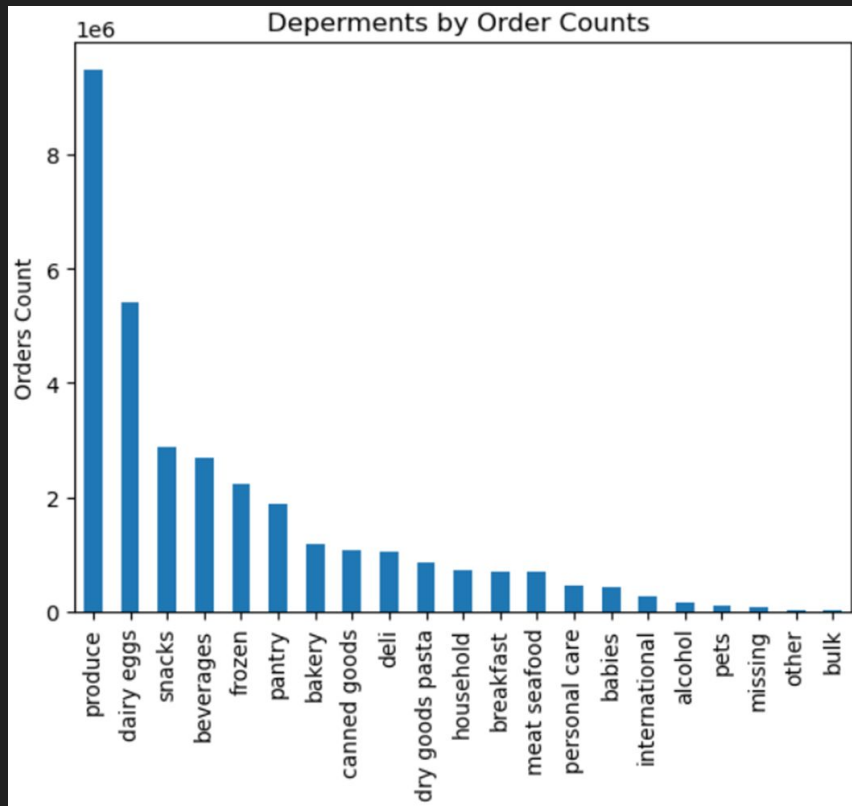
- Python
- Excel

Busy & Slow Days/Times



- The busiest days of the week are Friday, Saturday, and Sunday.
- Peak hours of an average day start at 10 AM and start slowing down at 4 PM.
- We can gather from the first bar chart that most customers stock up on food on the weekends to prepare for the week.
- I looked into the blank space in the histogram and found no missing values in the data. I plan to investigate further with stakeholders to thoroughly analyze.

Product Popularity



- The top 5 most ordered products are:
 - Produce
 - Dairy & Eggs
 - Snacks
 - Beverages
 - Frozen items
 - Considering that bakery, canned goods, and meat/seafood are not higher on the list, I assume users prefer to buy these at in-person groceries and have the rest delivered when needed. In this case, produce and dairy/eggs are the most needed products to have delivered.
- The bottom 5 products ordered are:
 - Bulk
 - Other
 - Missing
 - Pets
 - Alcohol
 - It is understandable that alcohol and pet items aren't ordered often, as alcohol delivery can get complicated and users with pets may go to a pet exclusive grocery, instead.

Brand Loyalty

Loyalty Flag Defined:

New customer = made less than 10 orders

Regular customer = made between 10 & 40 orders

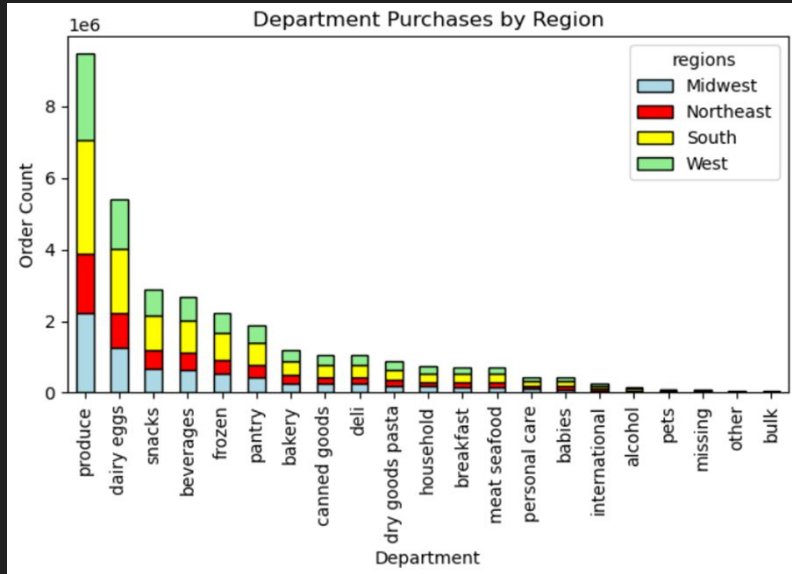
Loyal customer = made more than 40 orders

loyalty_flag	days_since_prior_order			
	mean	min	std	max
Loyal customer	6.026927	0.0	4.561078	30.0
New customer	17.977110	0.0	10.131070	30.0
Regular customer	12.155304	0.0	8.456092	30.0

loyalty_flag	total_spent			
	mean	min	std	max
Loyal customer	6162.800522	156.0	3142.506865	26651.1
New customer	690.924500	3.0	447.178475	3920.4
Regular customer	2446.791137	15.7	1545.585100	12186.6

- On average:
 - Loyal customers order every 6 days.
 - Regular customers order every 12 days.
 - New customers order every 17 days.
- On average:
 - Loyal customer spend \$6,162.80
 - Regular customers spend \$2,446.79
 - New customers spend \$690.92
- Instacart receives most of their profits from loyal customers. They order about 3x as often as new customers and spend money almost 2x more than regular customers.

Ordering Habits by Region

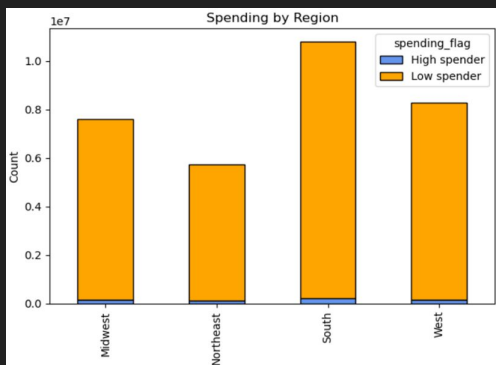


- This stacked bar chart shows what and how much of each department is bought from each region in the U.S.
 - The South Region orders the most from every department.
 - The West and Midwest Regions are almost tied while the Northeast Region orders the least.

Ordering Habits by Region continued

Spending Flag Defined:
Find total price spent & take the mean number:
High spenders = mean price spent \$10 or more
Low spenders = mean price spent less than \$10

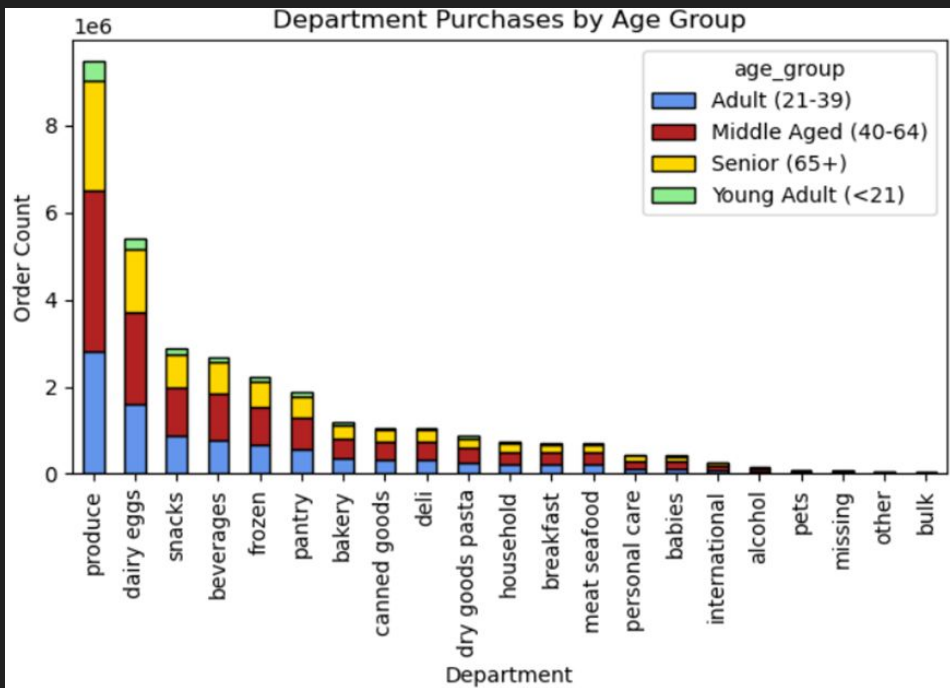
spending_flag	High spender	Low spender
regions		
Midwest	156129	7447681
Northeast	108343	5620004
South	210182	10591428
West	160807	8139638



- This chart depicts how much money each region spends and categorizes users as high or low spenders.
 - The South Region spends about double on Instacart orders compared to the Northeast Region.
 - There are about 50x more low spenders than high spenders on Instacart.

Key Demographics

Connection between age and ordering habits

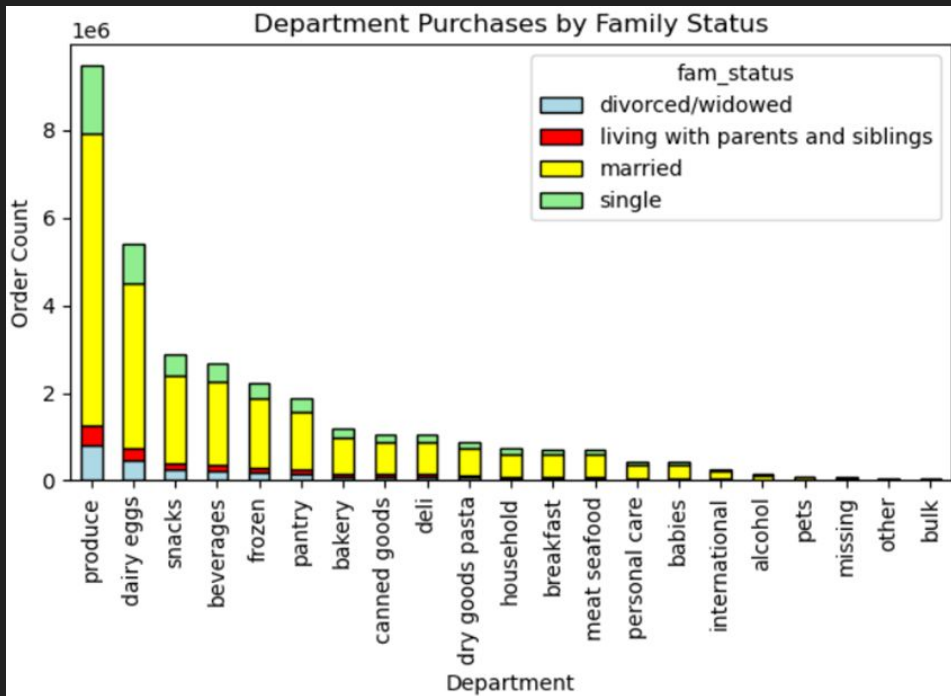


age_group	days_since_prior_order			
	mean	min	std	max
Adult (21-39)	11.098938	0.0	8.752963	30.0
Middle Aged (40-64)	11.117828	0.0	8.797748	30.0
Senior (65+)	11.079006	0.0	8.771372	30.0
Young Adult (<21)	11.165224	0.0	8.828628	30.0

- We can see that Middle Aged customers make up about 40% of orders in each department.
- On average, all age groups order every 11 days.

Key Demographics continued

Connection between family status and ordering habits

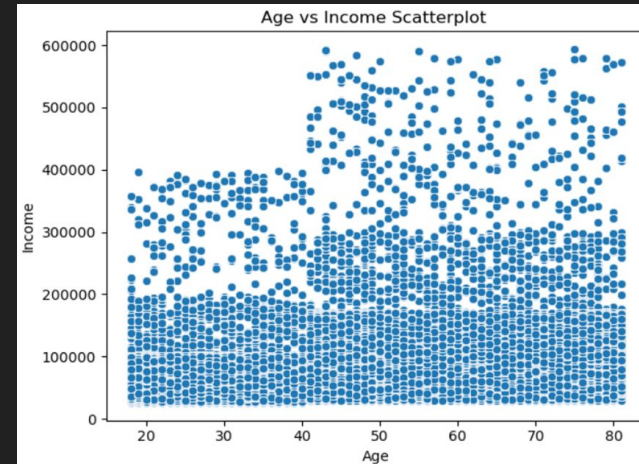
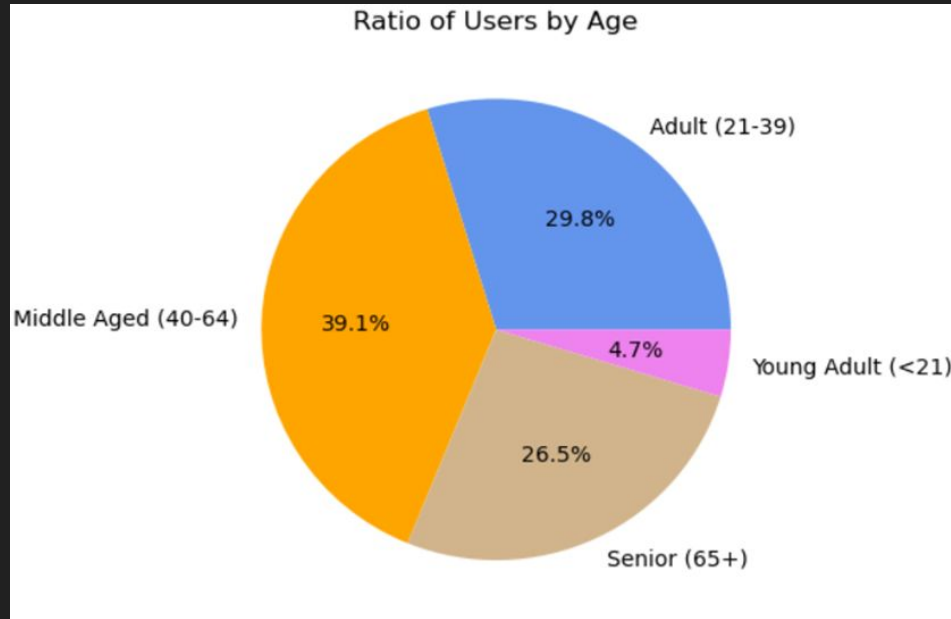


fam_status	days_since_prior_order			
	mean	min	std	max
divorced/widowed	11.047967	0.0	8.786195	30.0
living with parents and siblings	11.047919	0.0	8.764030	30.0
married	11.116379	0.0	8.780993	30.0
single	11.097592	0.0	8.770563	30.0

- In terms of family status, users who are married make up about 80% of orders.
- Similar to age groups, on average, all family groups order every 11 days.

Key Demographics continued

Further analyzing Middle Aged Married users:



- Majority of Instacart's profits come from users who are middle aged, which alone are 39.1% of all users.
- This demographic also reports that they have a higher income than others.

Key Demographics continued

Further analyzing Middle Aged Married users:

fam_status	divorced/widowed	living with parents and siblings	married	single
age_group				
Adult (21-39)	0	389886	6837748	2422159
Middle Aged (40-64)	652296	0	9478660	2546462
Senior (65+)	2122132	0	6460505	0
Young Adult (<21)	0	1162216	0	362148

fam_status	divorced/widowed	living with parents and siblings	married	single
income_profile				
High Income	1929691	49024	11054836	1793786
Low Income	226906	235753	2457229	677983
Middle Income	617831	1267325	9264848	2859000

Income Profile Defined:

High income = income greater than or equal to \$100,000

Middle income = income between \$50,000 and \$999,999

Low Income = income less than \$50,000

- Of all married customers, 55.8% of them are middle aged.
- 48.5% of married users also fall into the high income category.
- We can assume that users who have these demographics lead to more spending in Instacart.
- This is likely due to:
 - Being well into their career and having high income.
 - Being married and having children, which means getting groceries delivered is convenient, saves time, thus using Instacart more.

Recommendations

- Advertisements
 - In order to maximize ads, they should be pushed during the slower parts of the day and slower parts of the week.
 - Ads should be pushed often on Mondays, Tuesdays, Wednesdays, & Thursdays.
 - Ideally as early as 7 AM and slow around 9:30 AM while peak hours occur (10 AM - 4 PM)
 - Then continue pushing ads as the day slows down from 6 PM - 8 PM.
 - Ads should still be pushed during peak hours and weekends, but less frequent.
 - These slower ads should consist of deals or promotions on less bought items.
- Most ordered and least ordered products
 - In efforts to save money, we can remove products and items that are not doing well for long periods of time.
 - Alternatively, we can promote low selling items with frequently bought items, like beverages paired with alcohol.
 - Or produce paired with international
 - We can market as “Frequently bought together”

Recommendations continued

- Brand loyalty
 - Since loyal customers bring the most revenue, we should incentivise these users with special promotion:
 - Coupons
 - Happy hour deals
 - Invite friends to sign up rewards
 - We can also incentivise regular and new customers with the same rewards if they order a certain amount of times per week.
- Ordering habits
 - Seeing how 90% of customers are low spenders, I don't see the need to provide high priced items, like expensive meats or high-end shampoo.
 - However, if Instacart does want to continue having these higher priced items, I suggest we advertise these products solely to users who have a history of buying items over \$10. This way, these items can continue to be purchased by high spenders and irrelevant ads won't be pushed towards low spenders.

Recommendations continued

- Key demographics
 - Although Middle Aged Married High Income users are the largest demographic in Instacart, there are still other profiles that can be improved on.
 - Single customers have the second largest amount of orders after married customers and have high-to-middle income, which means they use Instacart just as often.
 - We should further analyze what single customers buy often and repeat advertisement strategies like “Order again” or “Frequently bought together.”

THANK YOU FOR READING