instacart

Title page

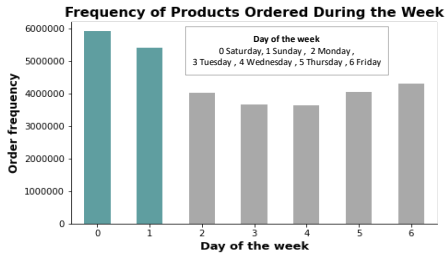
Recommendations

Recommendations based on the analysis carried out only on the active customers files: analysis_active_customer and with profiles analysis_active_customer_profiles.csv

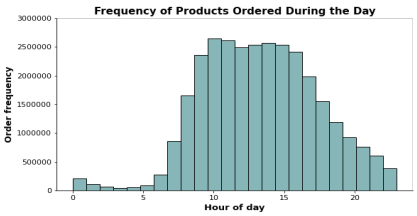
Further visualisations and analysis that informed the key questions can be found here

Key Questions and Recommendations

Key Question 1 • The sales team needs to know what the busiest days of the week and hours of the day are (i.e., the days and times with the most orders) in order to schedule ads at times when there are fewer orders.



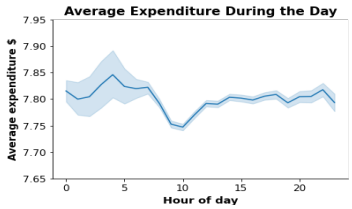
The weekend, **Saturday (day 0) and Sunday (day 1), are the busiest days of the week**. the least busy days are around the middle of the week Tuesday (day 2) and Wednesday (day 3).



The histogram shows that **most of the orders are placed between 9 am and 4 pm** (around 2.5 million orders per hour). This peak tails off around 5 pm and there are fewer orders (below 5 million orders) between 11 pm and 6 am.

Recommendation: Tuesday and Wednesday are the least busy days and there are fewer orders (below 1.5 million) in the period between 6 pm and 9 am, which could be considered a good time to schedule ads. The adverts will reach more customers between 6 pm and 12 am.

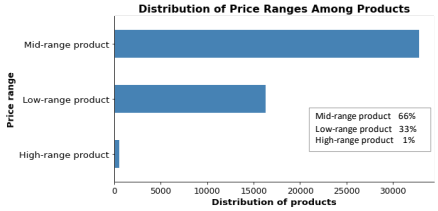
Key Question 2 • They also want to know whether there are particular times of the day when people spend the most money, as this might inform the type of products they advertise at these times.



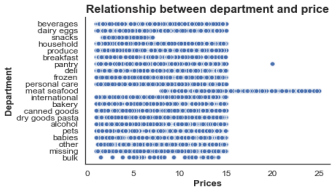
The average expenditure during the day is around 7.80 dollars. There is a slight decrease from **the high (7.85 dollars) around 4 am** to the low point (7.75 dollars) around 9 am. *[NB this chart was produced using a representative sample (70%) of the data.]*

Recommendation: Customers spend slightly more money $7.85 (as opposed to $7.80) around 4 am. However the thicker light blue band shows there is also more uncertainty around this estimate with the range varying from around $7.79 to $7.89. It might be worthwhile investigating the reason for the dip between 7 am and 12 pm, where there is very little uncertainty, and to target adds to increase spending during this period.

Key Question 3 • Instacart has a lot of products with different price tags. Marketing and sales want to use simpler price range groupings to help direct their efforts.



Around two thirds of the Instacart products are Mid-range products (32801) priced between $5 and $15, one third are Low-range products (16280) and only 1% High-range products (547) . *[Excluding the outlier products priced above $25.]*



Within the departments **only 'pantry' and 'meat seafood' have products above $15**. Prices of products in most departments range from $1.00 to $15.00 with the exception of the 'snacks' department $1.60 to $7.00 and bulk $1.4 to $14.

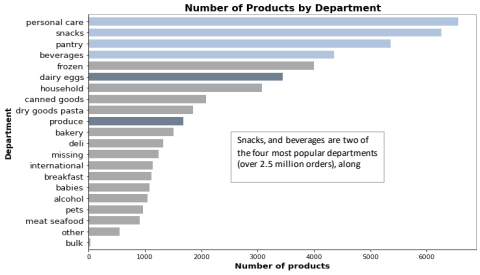
Recommendation: Only 1% of the products are above $15 and they are mainly in the 'meat seafood' department, while around two thirds are Mid-range products. Where possible increase the maximum price in more departments and increase the number of products in the High-range product group.

Key Question 4 • Are there certain types of products that are more popular than others? The marketing and sales teams want to know which departments have the highest frequency of product orders.

In descending order **the four most popular departments with over 2.5 million orders are produce, dairy eggs, snacks and beverages**. Alcohol, pets, missing, other and bulk have the lowest product orders.

Product	Percentage	Mean Price $	
produce	29%	7.98	
dairy eggs	17%	8.34	
snacks	9%	4.28	lowest
beverages	8%	7.68	
frozen	7%	7.73	
pantry	6%	8.01	
bakery	4%	7.86	
canned goods	3%	7.55	
deli	3%	7.78	
dry goods pasta	3%	7.35	
household	2%	7.38	
meat seafood	2%	16.30	highest
breakfast	2%	8.03	
personal care	1%	8.00	
babies	1%	7.63	
international	1%	7.68	
alcohol	0%	8.15	
pets	0%	7.89	
missing	0%	8.86	
other	0%	6.96	
bulk	0%	8.35	

Recommendation: The four departments with the highest number of orders are 'produce' (29%), 'dairy eggs' (17%), 'snacks' (9%) and 'beverages' (8%). The 'snacks' department has a mean price of $4.28 and the other three departments around $8.00. The 'meat seafood' department with a mean price of $16.00 only accounts for 2% of the total orders. As recommended above, where possible increase prices, especially in the top departments and also the frequency that customers purchase from the other departments.

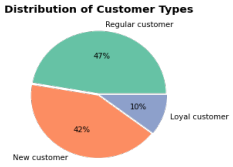


The personal care department has 13% of the total number of products, followed by snacks (13%), pantry (11%) and beverages (9%). The dairy and eggs department has 7% of the total number of products and produce has 3%. **Despite having the most products the personal care department only accounts for 1% of the total orders** compared to produce with 29% of the total orders. **The items in the personal care department are not as popular.**

Recommendation: Look at increasing orders or reducing the number of items stocked in departments such as personal care, where orders are low, but there is a large range of products.

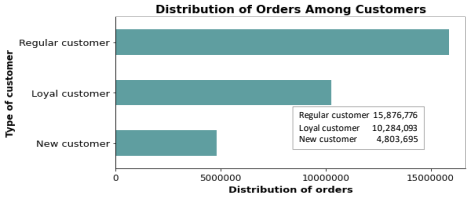
Key Question 5

- The marketing and sales teams are particularly interested in the different types of customers in their system and how their ordering behaviours differ. For example:
  - What's the distribution among users in regards to their brand loyalty (i.e., how often do they return to Instacart)?



Only 10% (17017) of the active customers are Loyal customers with maximum orders over 40, while nearly half (76864) are classified as Regular customers i.e. customers with maximum orders over 10 and less than or equal to 40. The remaining 42% (68750) are classified as New customers.

- Are there differences in ordering habits based on a customer's loyalty status?



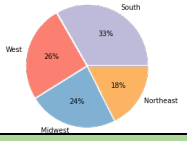
Regular customers place the highest number of orders among the three customer groups. 51% of the orders placed are by Regular customers, 33% by Loyal customers and 16% by New customers .

Recommendation: Although Loyal customers are only 10% of the total number of customers they account for one third of the orders placed. Therefore an analysis on the profiles of these customers and their ordering habits is recommended and then to target similar customers in the Regular and New customer groups with the aim of converting them to Loyal customers.

- Are there differences in ordering habits based on a customer's region?

Spending habits based on individual user_id

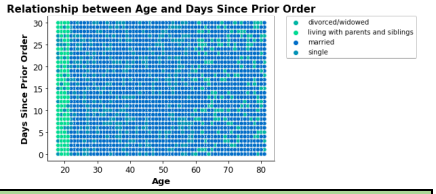
Region	Spending Flag			
	High spender		Low spender	
	%	Count	%	Count
Midwest	3	885	97	37,491
Northeas	2	614	98	27,967
South	3	1,264	97	52,929
West	3	948	97	40,533



Most (33%) Instacart customers live in the South region, followed by the West and Midwest regions, while the Northeast region has the least (18%). **Although the number of customers in the regions differ, the spending habits across the regions are similar** with the proportion of high spenders (around 3%) and low spenders (around 97%).

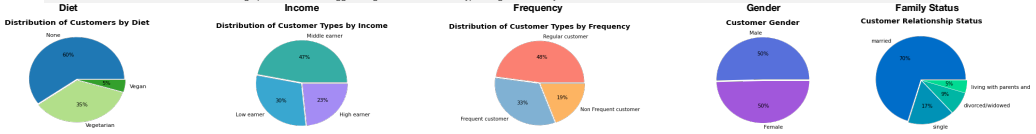
When examined in more detail by the different classifications, such as loyalty, family status and generation, there are some regional differences. However similar to spending the overall percentages per region for each classification are more or less the same.

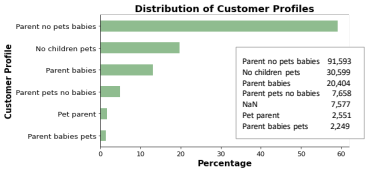
- Is there a connection between age and family status in terms of ordering habits?

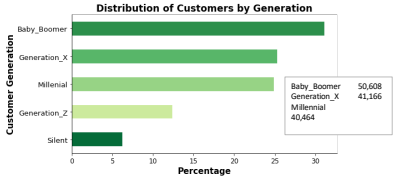


There are clear age ranges within the family status groups with the married group having the largest age range and the living with parents and siblings group the smallest age range. **No relationship exists between age and the maximum order number per customer** or **age and the number of days since prior order**.

- What different classifications does the demographic information suggest? Age? Income? Certain types of goods? Family status?

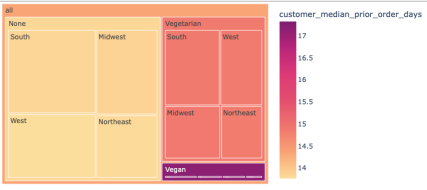






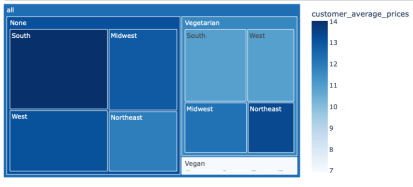
- What differences can you find in ordering habits of different customer profiles? Consider the price of orders, the frequency of orders, the products customers are ordering, and anything else you can think of.

Treemap showing the relationship between diet, customer median prior order days and region



The interactive file can be downloaded and then viewed using this link:
https://drive.google.com/file/d/15HgjhDFFKl6tdKX12BeqN-xY2iG_s_iH/view?usp=sharing

Treemap showing the relationship between diet, customer average prices and region



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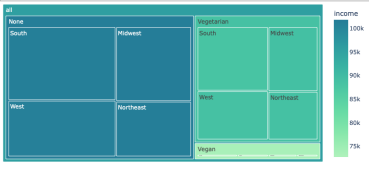
Diet

In all three charts there are clear differences between the diet classification groups. The **Vegan group on average wait more than 2 weeks (17 days) to place an order, they also spend less ($7) and earn less** ($73, 518) than the other groups in this classification. The vegetarian group earns ($88,682) less than the average income $95,686.

The diet flag classification was derived by grouping customers based on which departments they ordered from. The vegan group excludes the 'meat seafood and 'dairy eggs' department, and the Vegetarian group only excludes the 'meat seafood' department. The Vegan group excludes one of the most popular departments 'dairy eggs' and the one with the highest prices 'meat seafood'.

Treemap showing the relationship between diet, income and region



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Some of the questions raised: Which groups are online when - target specific groups? Which items are not selling at all or in very low numbers - why? What do the loyal customers have in common? Are some departments, such as personal care, overstocked with similar items? What customer classifications would help marketing?