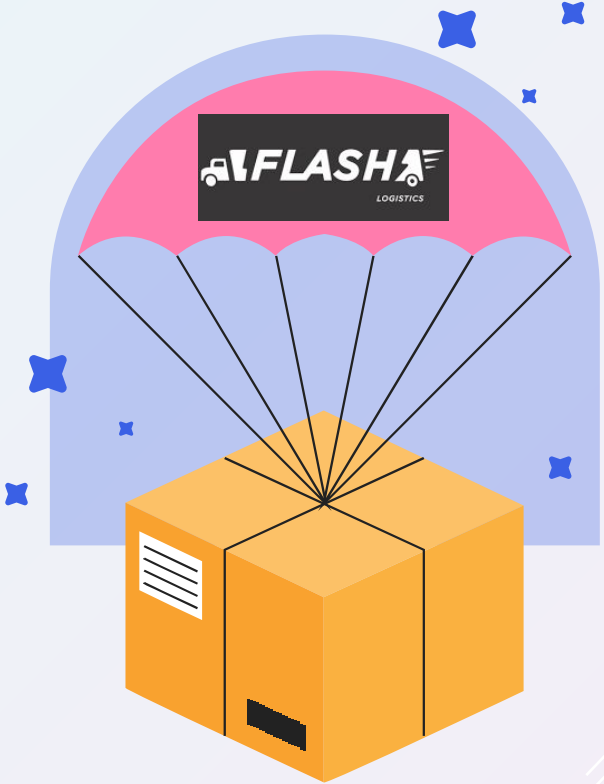

E-commerce Delivery Fleet Deployment in Brazil

Team 7

By: Charlie, Lee Sim, Ma Li, Vania

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Background of the project

02

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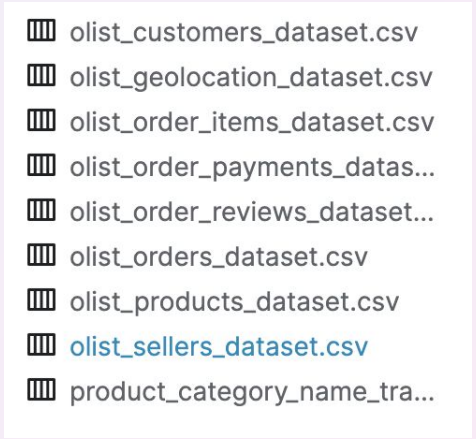
01 Background

Who we are and our goals

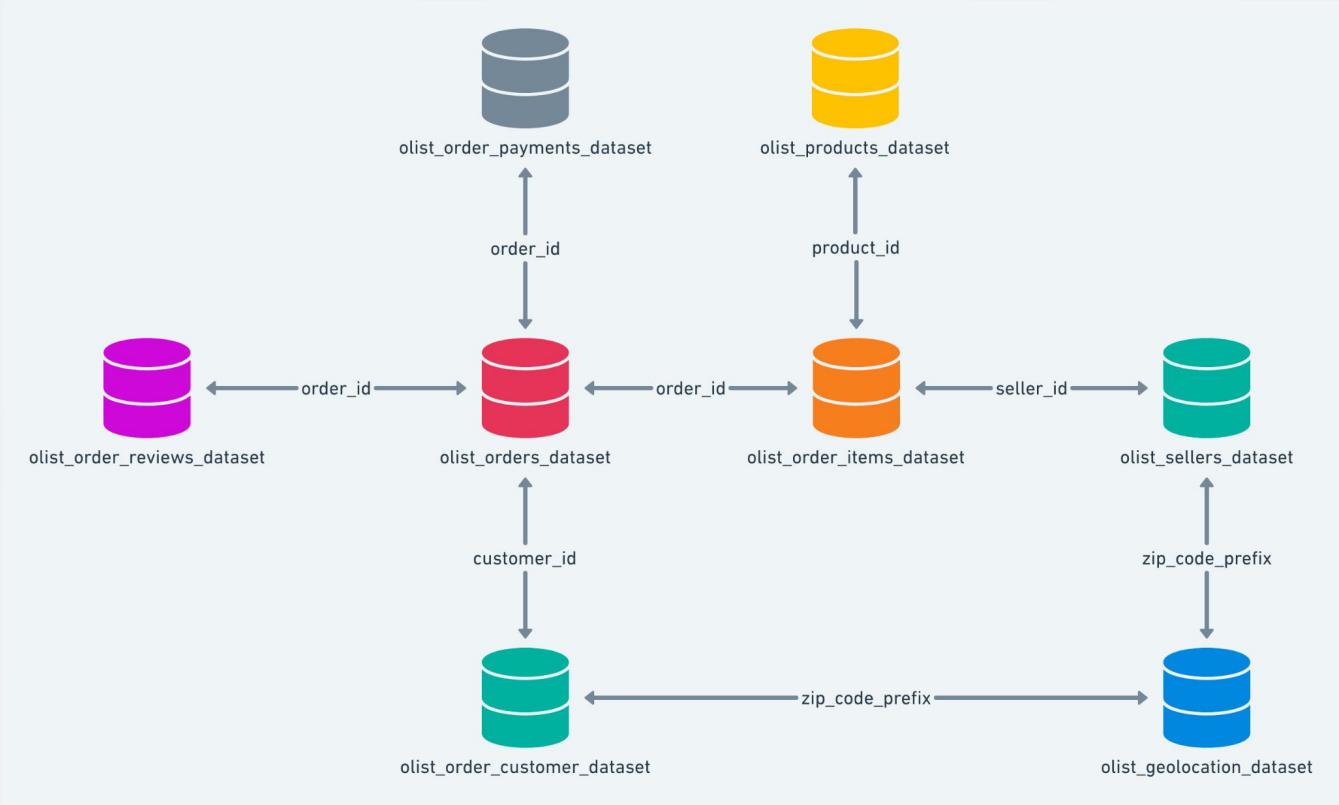
- Who we are
  - Flash Logistics, Brazilian logistics company
  - We have recently secured contract with Olist to take care of their deliveries
- Our goals
  - Increase business revenue
  - Optimise delivery team deployment to better cater to Olist’s delivery needs in the future

Dataset and Tools Used

- **Dataset**
  - Sourced from Kaggle
  - Spans across three years (2016 to 2018)
  - Nine tables
- **Tools Used**
  - Tableau
  - Python/Pandas

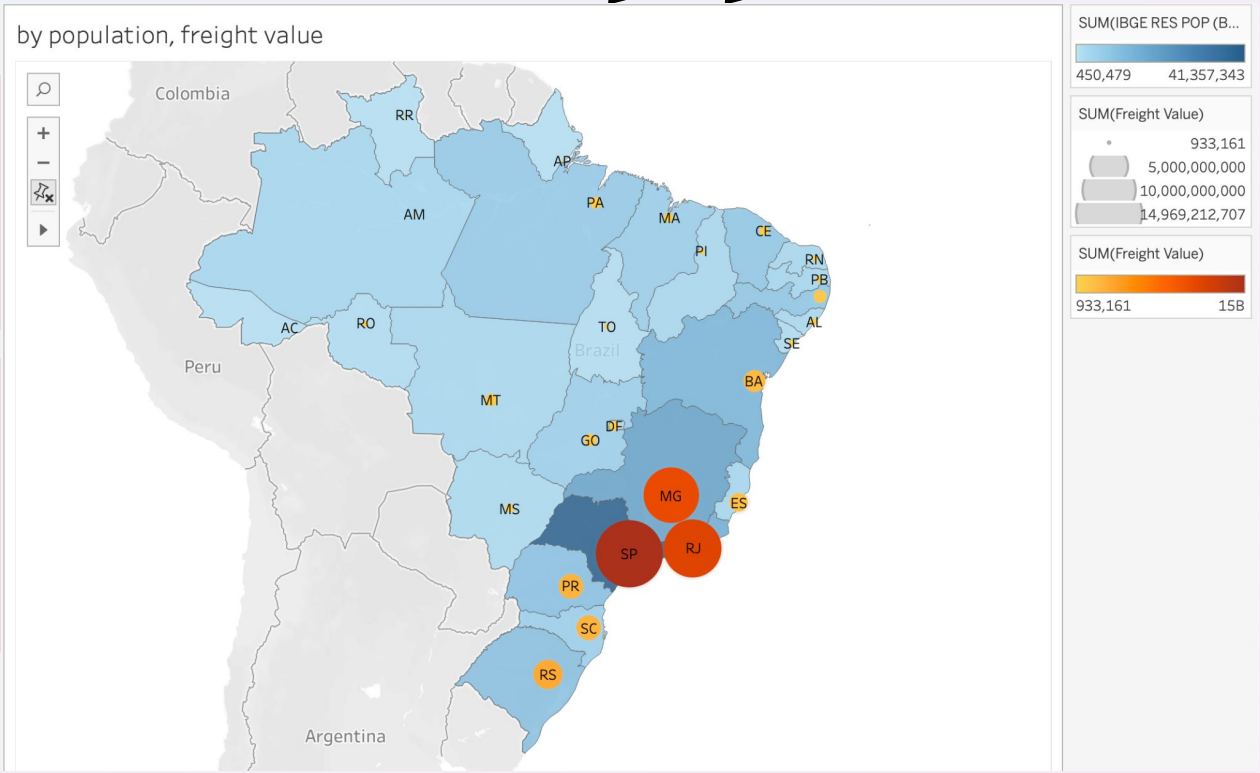


Data Schema


olist_order_payments_dataset
olist_products_dataset
order_id
product_id
olist_order_reviews_dataset
order_id
olist_orders_dataset
order_id
olist_order_items_dataset
seller_id
olist_sellers_dataset
customer_id
zip_code_prefix
olist_order_customer_dataset
zip_code_prefix
olist_geolocation_dataset

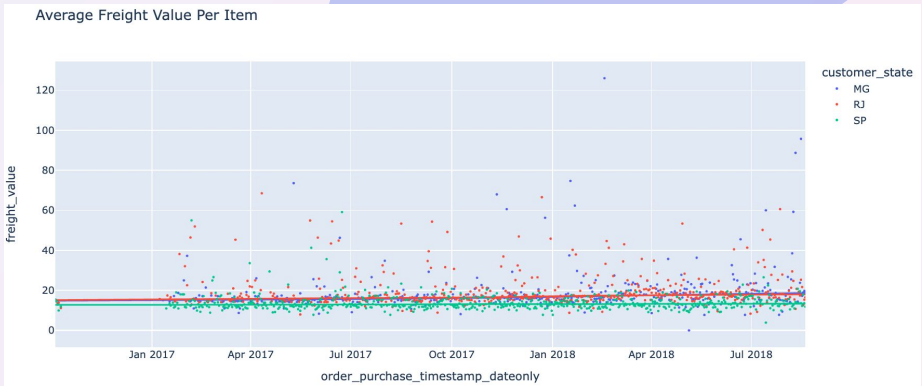
02 Data Analysis

SP, RJ, MG have the highest freight value and population

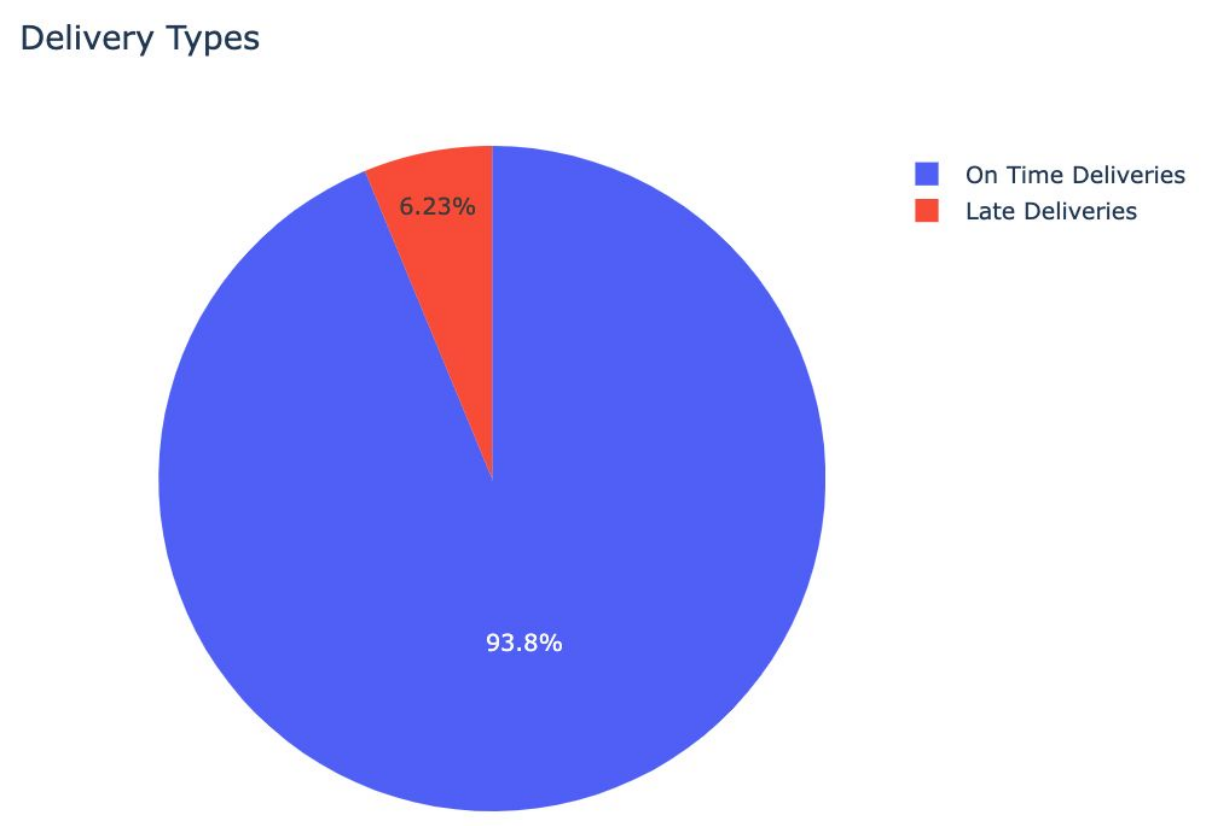


Delivery Fee Analysis

Freight value seems to be correlated with Gasoline and Diesel prices

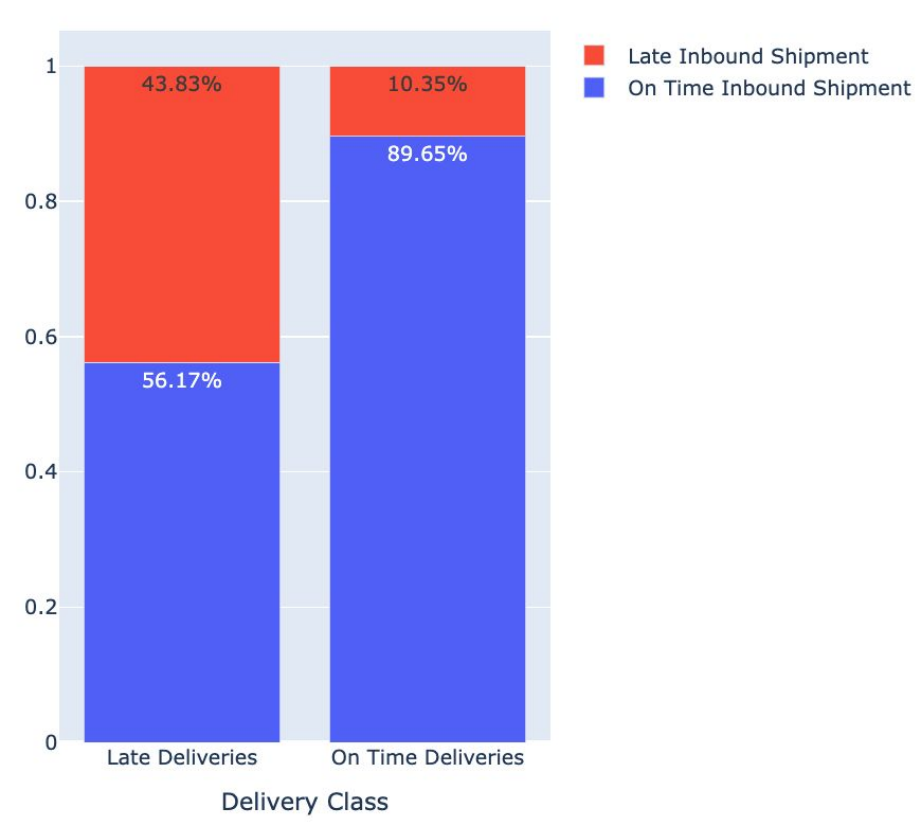


Delivery Data Analysis



Classified based on whether the product was delivered to the customer before/ after the estimated delivery date

Delivery Data Analysis



Inbound shipment

- Sellers handing over the products to the logistics partner (us)
- Classified based on whether the product arrived before/after the shipping limit date
- Possibly other factors resulting late delivery besides late inbound shipment

Delivery Data Analysis

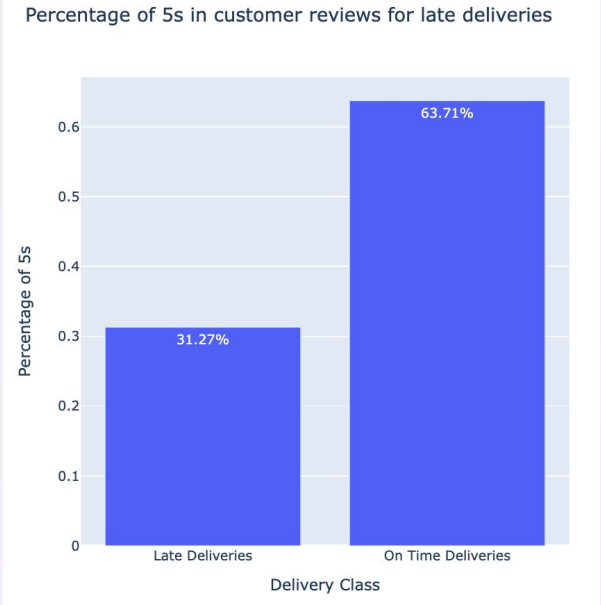
Inbound shipment

- Sellers handing over the products to the logistics partner (us)

Outbound shipment

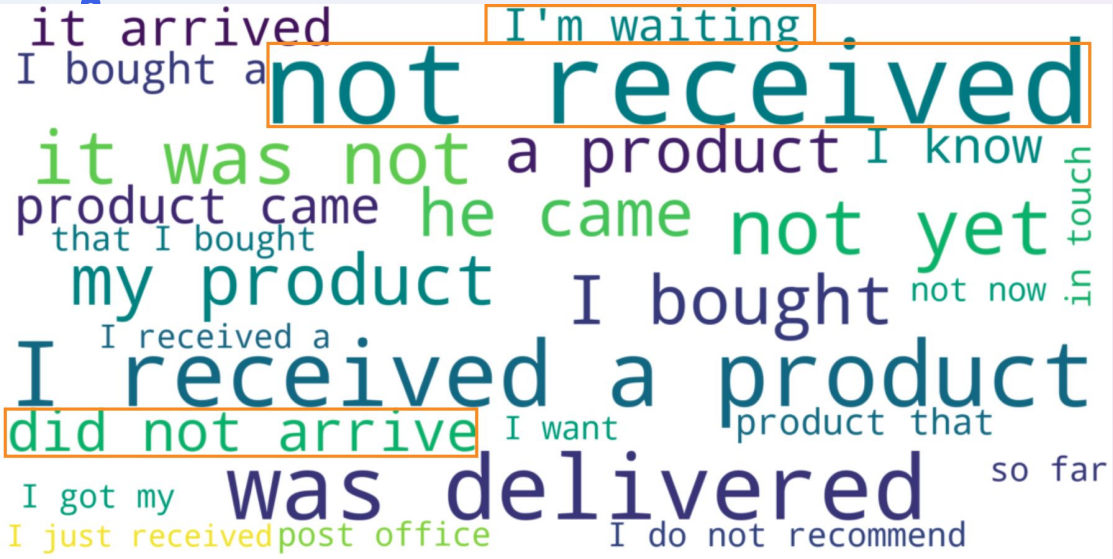
- We delivering the products to customer
- Classified based on whether product was delivered to the customer before/ after the estimated delivery date
- Bottleneck of the delivery chain

Delivery Data Analysis



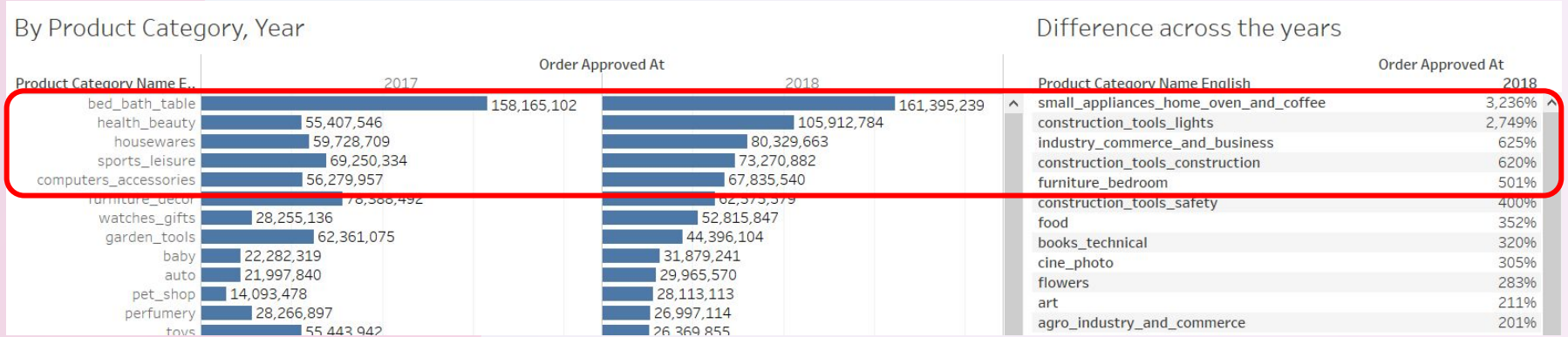
Late delivery increases the chances of low customer review scores

Delivery Data Analysis



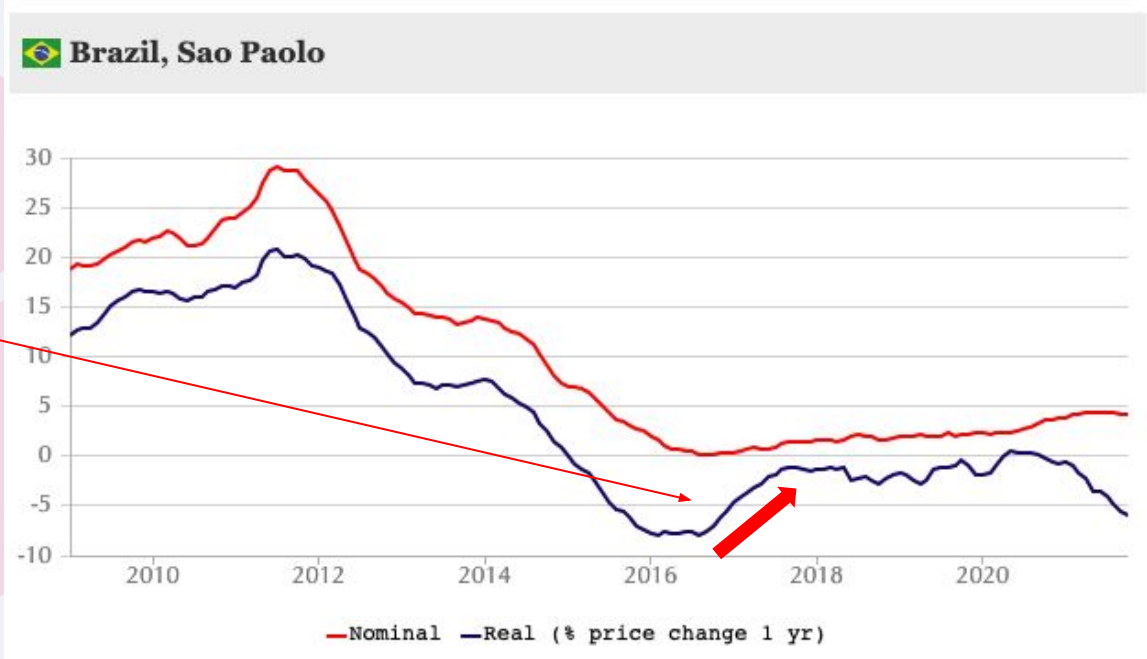
Based on reviews with score of 1, delivery-related complaints are the most frequent

Most Popular Product Category



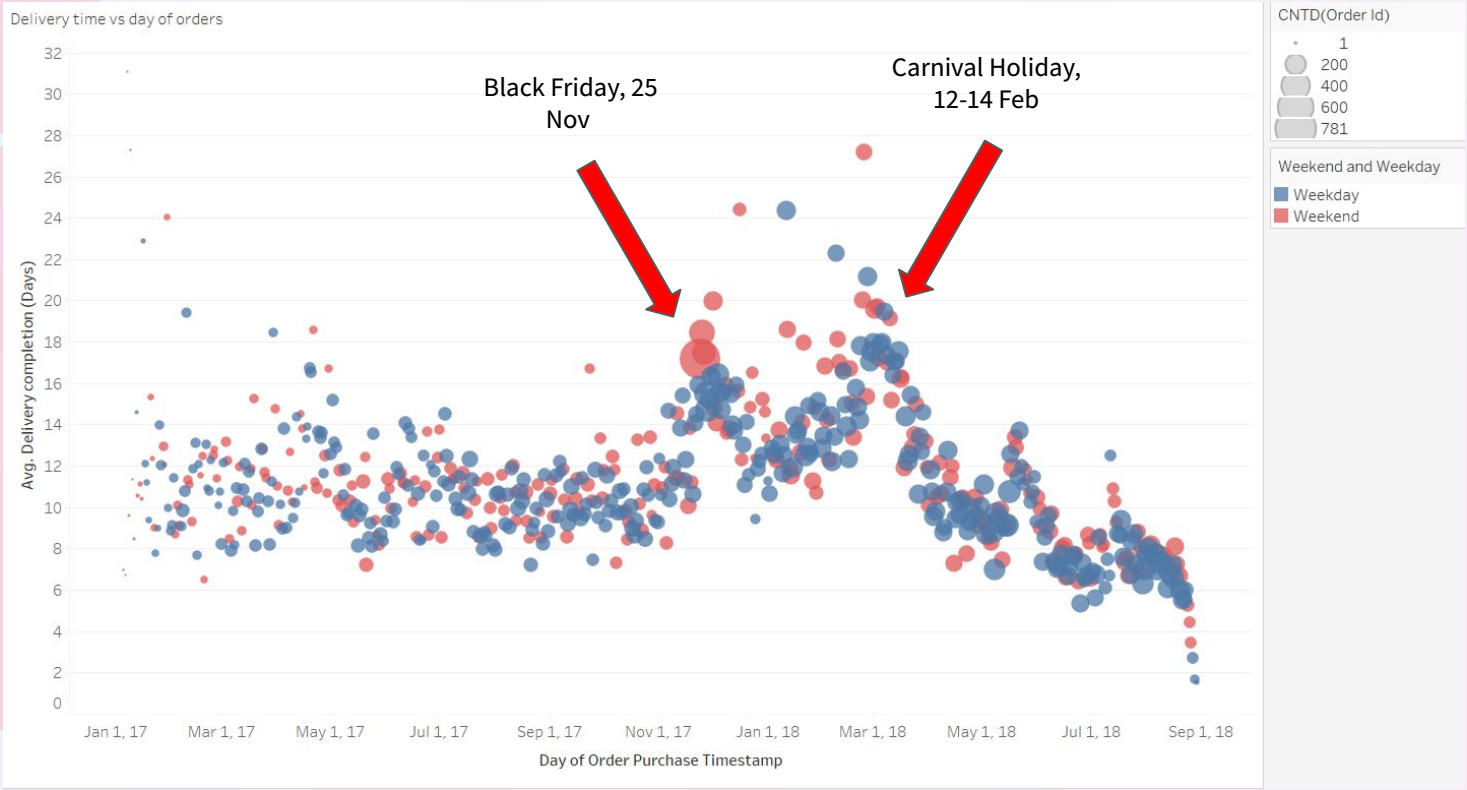
Brazil's Housing Market

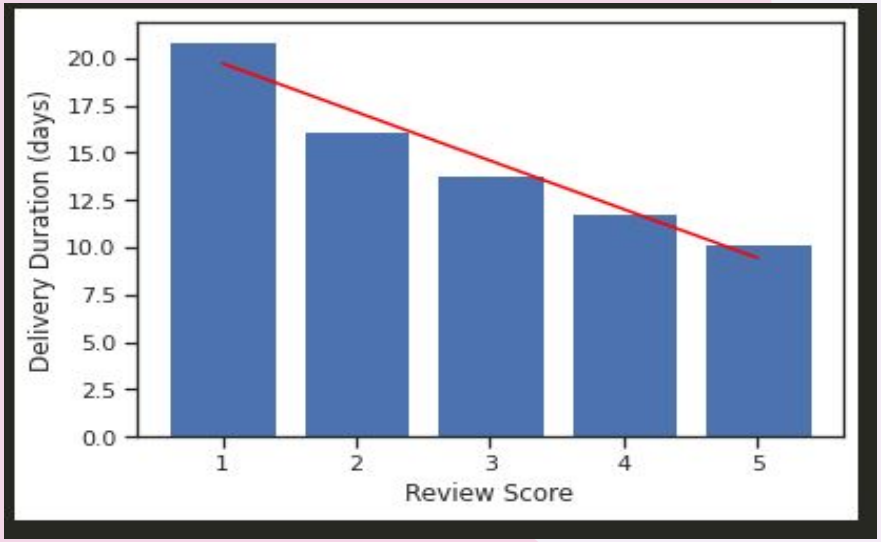
Increase in housing price from 2017-2018



Forecast of next 6 Month Order

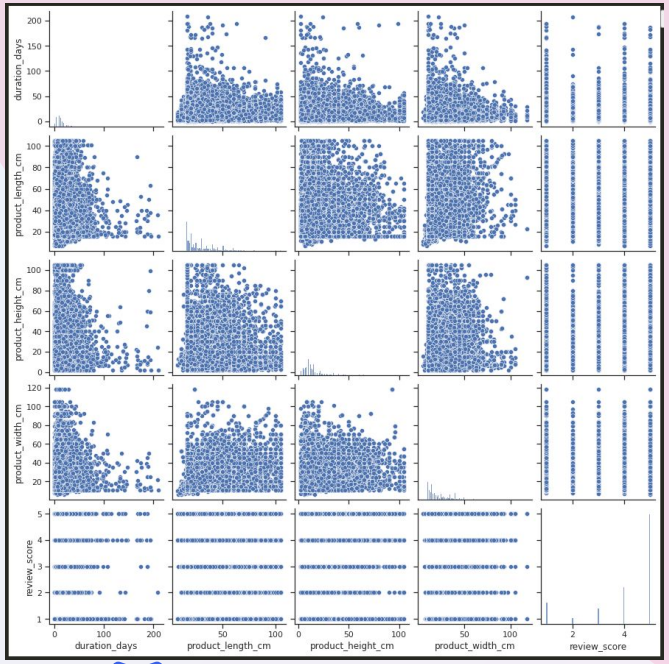
Orders Trend and Popular Order Day

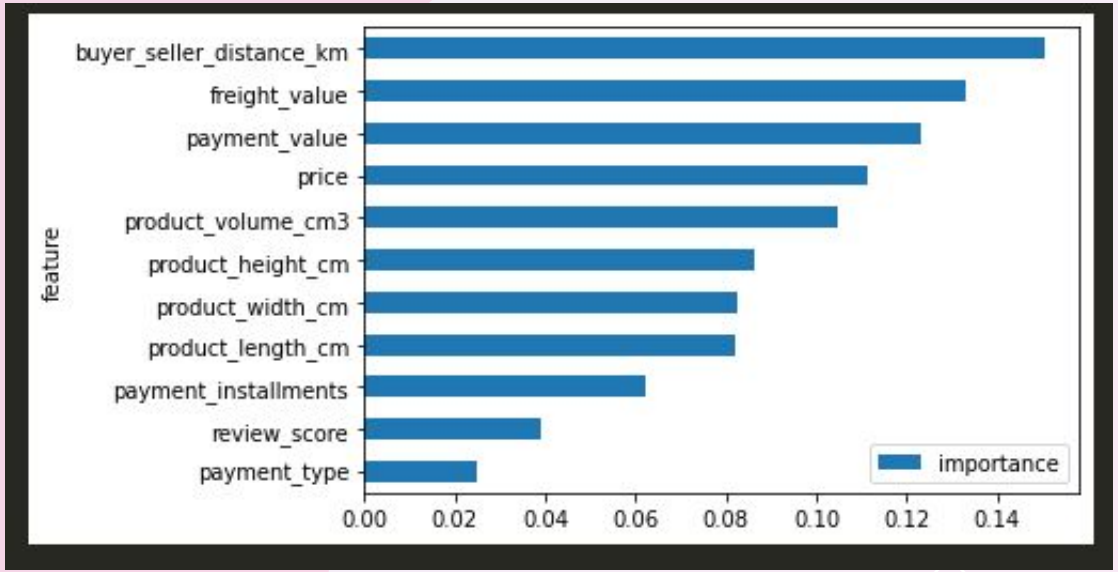




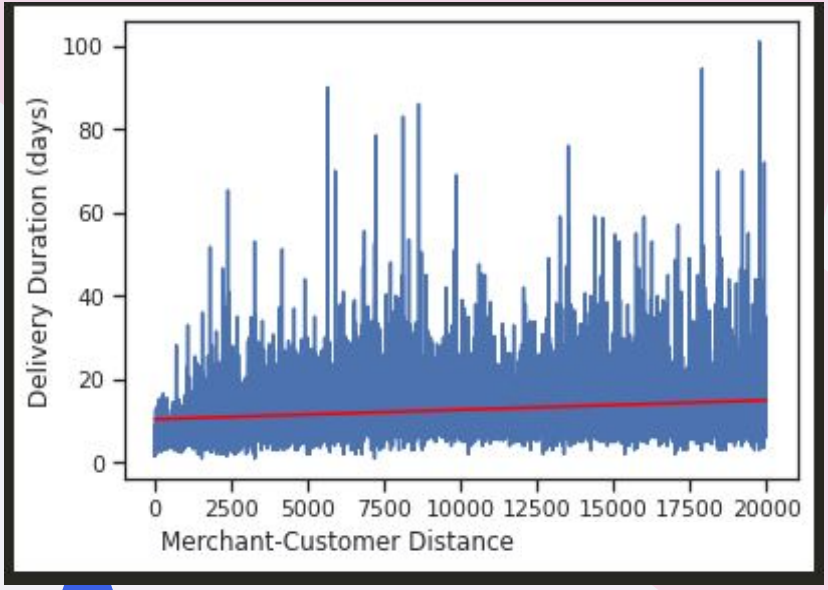
Minimizing Delivery Time

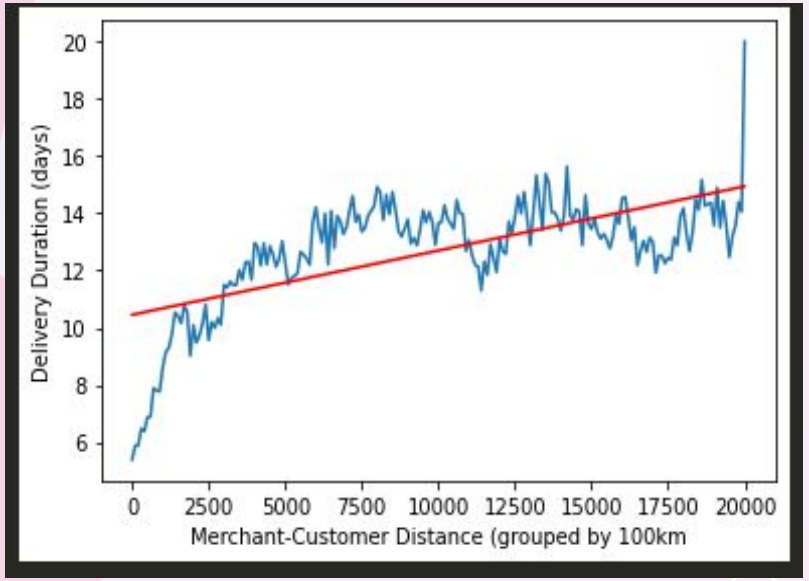
What affects delivery duration the most?



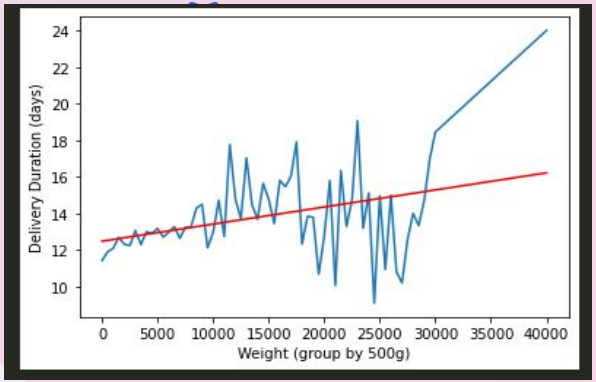


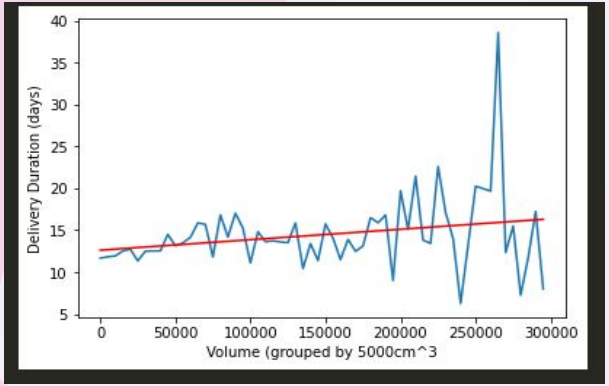
Top Feature from RF:
- Buyer Seller Distance

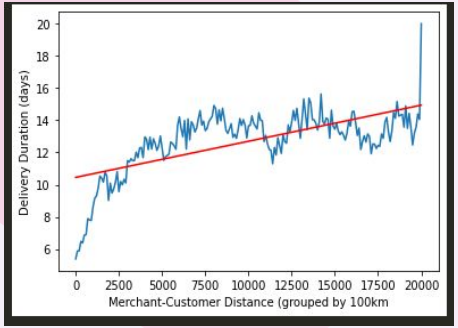




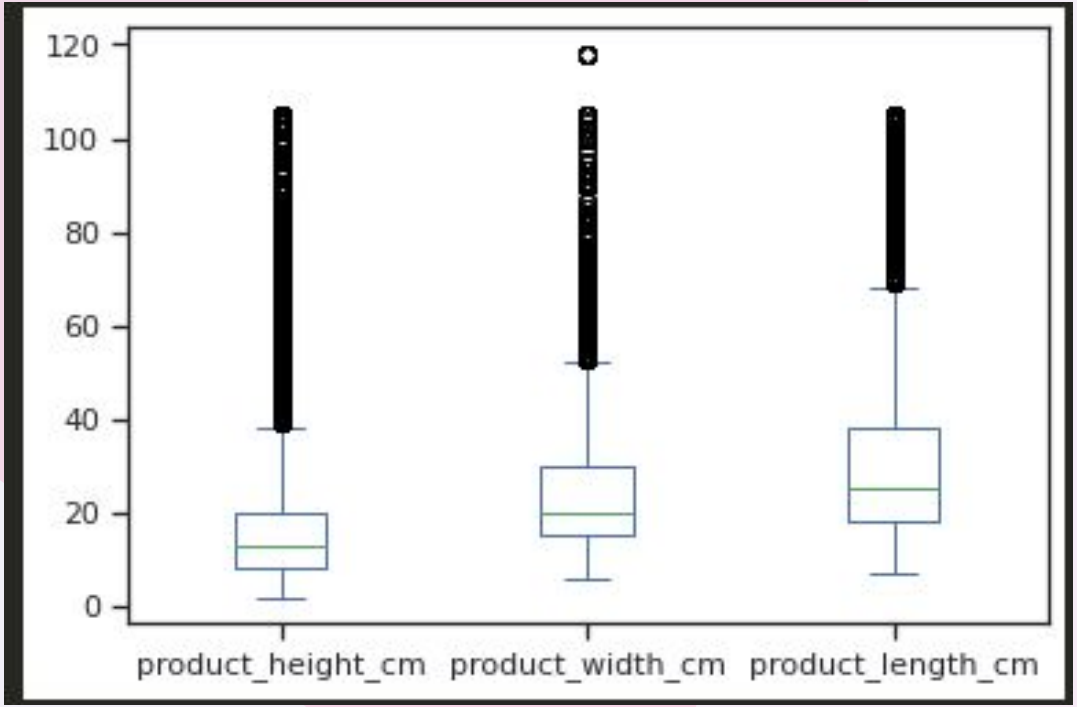
Other Features from RF:



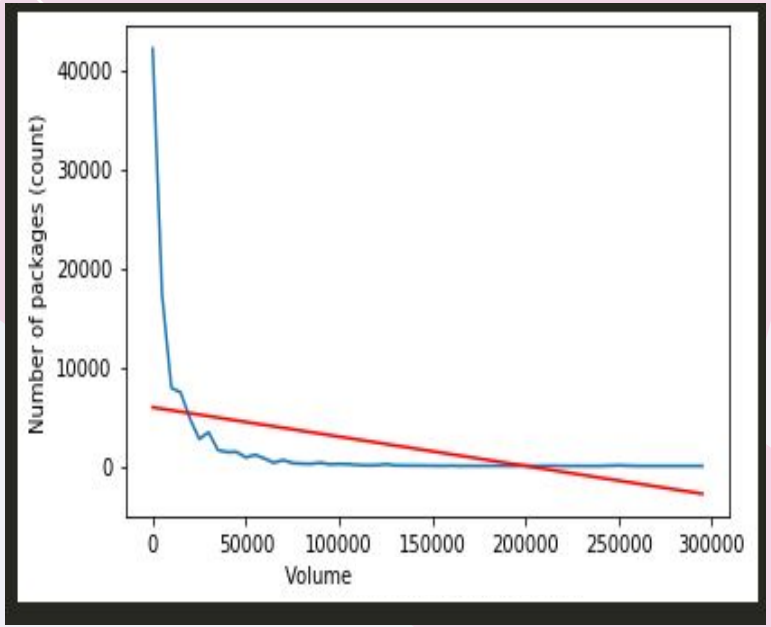


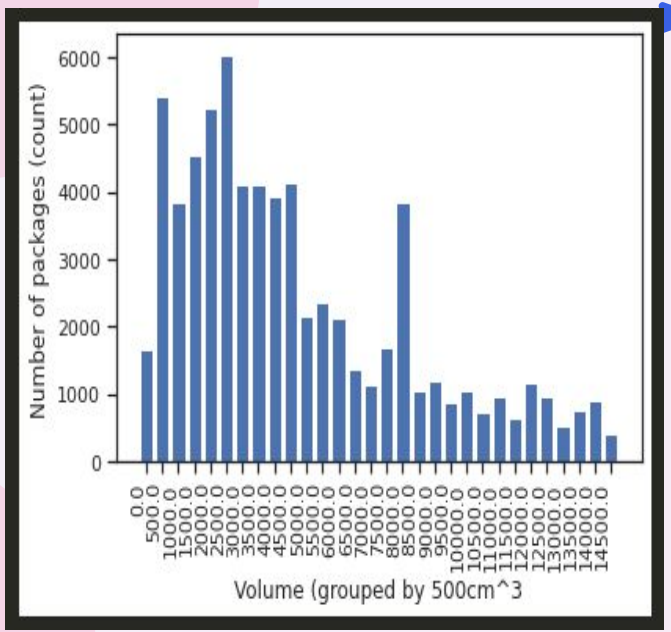


Box Dimension?



Small Boxes


Number of packages (count)
40000
30000
20000
10000
0
0
50000
100000
150000
200000
250000
300000
Volume


Number of packages (count)
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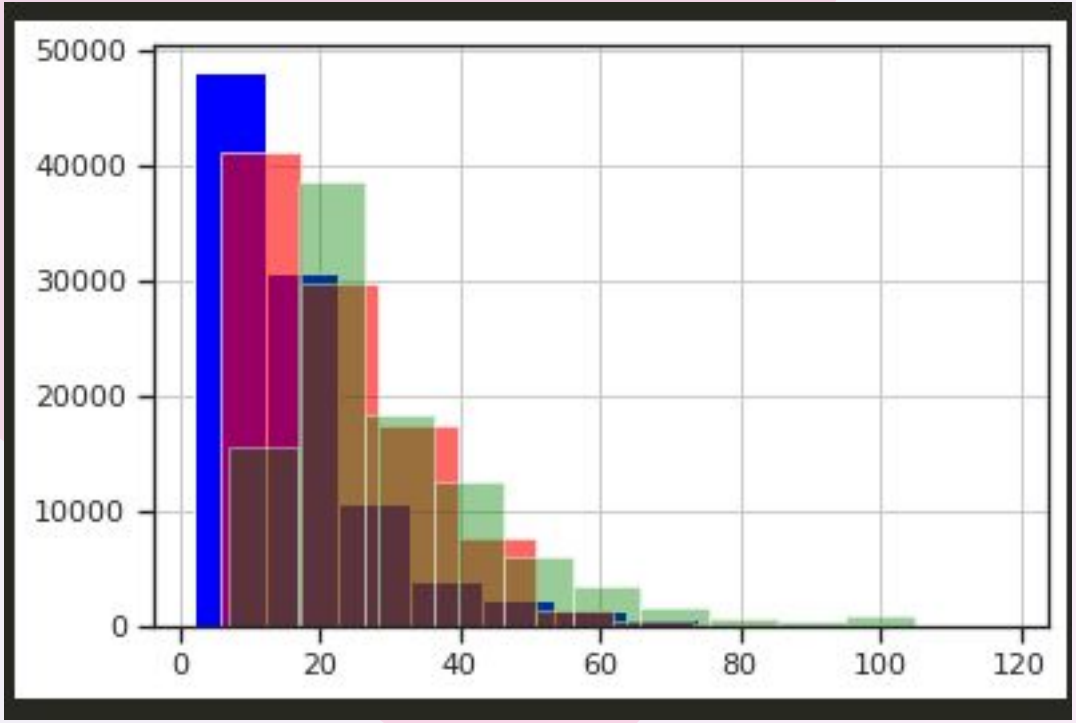
5000
4000
3000
2000
1000
0
0.0
500.0
1000.0
1500.0
2000.0
2500.0
3000.0
3500.0
4000.0
4500.0
5000.0
5500.0
6000.0
6500.0
7000.0
7500.0
8000.0
8500.0
9000.0
9500.0
10000.0
10500.0
11000.0
11500.0
12000.0
12500.0
13000.0
13500.0
14000.0
14500.0
Volume (grouped by 500cm^3

Product Size Overlap

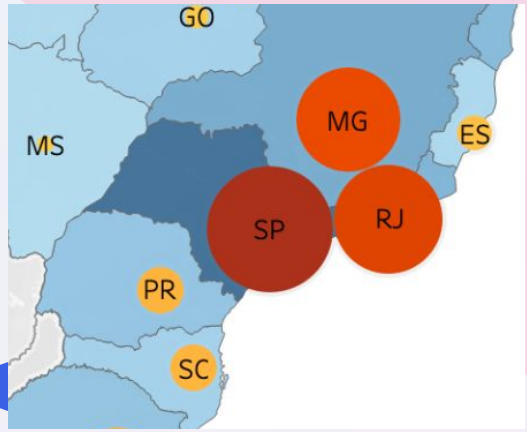


03 Recommendations

Recommendations

Insight

SP, RJ and MG make up the biggest freight values



Recommendation

Focus our resources on them

Sao Paolo

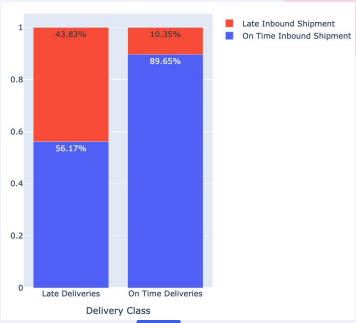
Rio de Janeiro

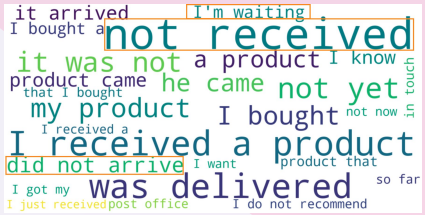
Minas Gerais

Recommendations

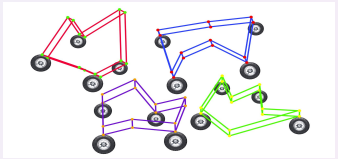
Insight

Missing &/or late deliveries leads to unhappy customers





Recommendations



Cluster delivery points based on distance

Work with Olist to remind sellers to send items to the warehouse on time

Incorporate IoT to track goods on every stage of delivery

Recommendations

Insight

Top 5 up-and-coming categories are *Small Appliances Home Oven and Coffee, Lights, Industry Commerce and Business Items, Construction Tools, Bedroom Furniture*

Difference across the years

	Order Approved At
Product Category Name English	2018
small_appliances_home_oven_and_coffee	3,236%
construction_tools_lights	2,749%
industry_commerce_and_business	625%
construction_tools_construction	620%
furniture_bedroom	501%

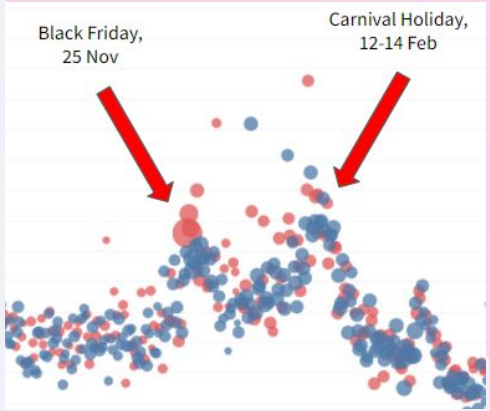
Recommendation

Increase staff training on handling fragile items

Recommendations

Insight

Delivery demands spike on Black Friday and Carnival Holiday



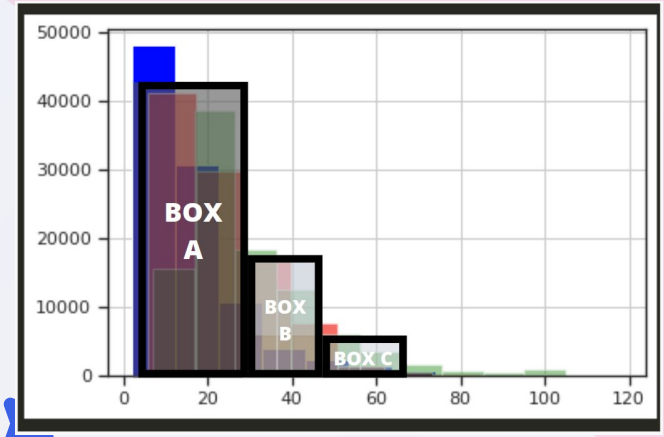
Recommendation

Increase deployment during holiday periods

Recommendations

Insight

Most common overlaps of box sizes



Recommendation

Create standardized boxes

24x24

45x45

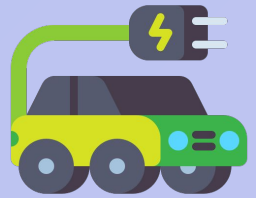
65x65

04 Future Works

Things that we can explore further

Incorporate weather data into our analysis

Plan delivery route in advance



Keep fuel costs low

Research how to reduce fuel consumption e.g. use of electric vehicles (EVs)

Thank you!