



A Retail Analysis

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Introduction

Background :

- Customer transactions dataset
- Online unique all-occasion gift ware retailer

Data :

- 525461 observations
- Invoice dates ranged from 2009-12-01 to 2010-12-09

Goal :

- Identify types of customers
- Predict future orders

Agenda

Data Analysis

Customer Types

Forecasting

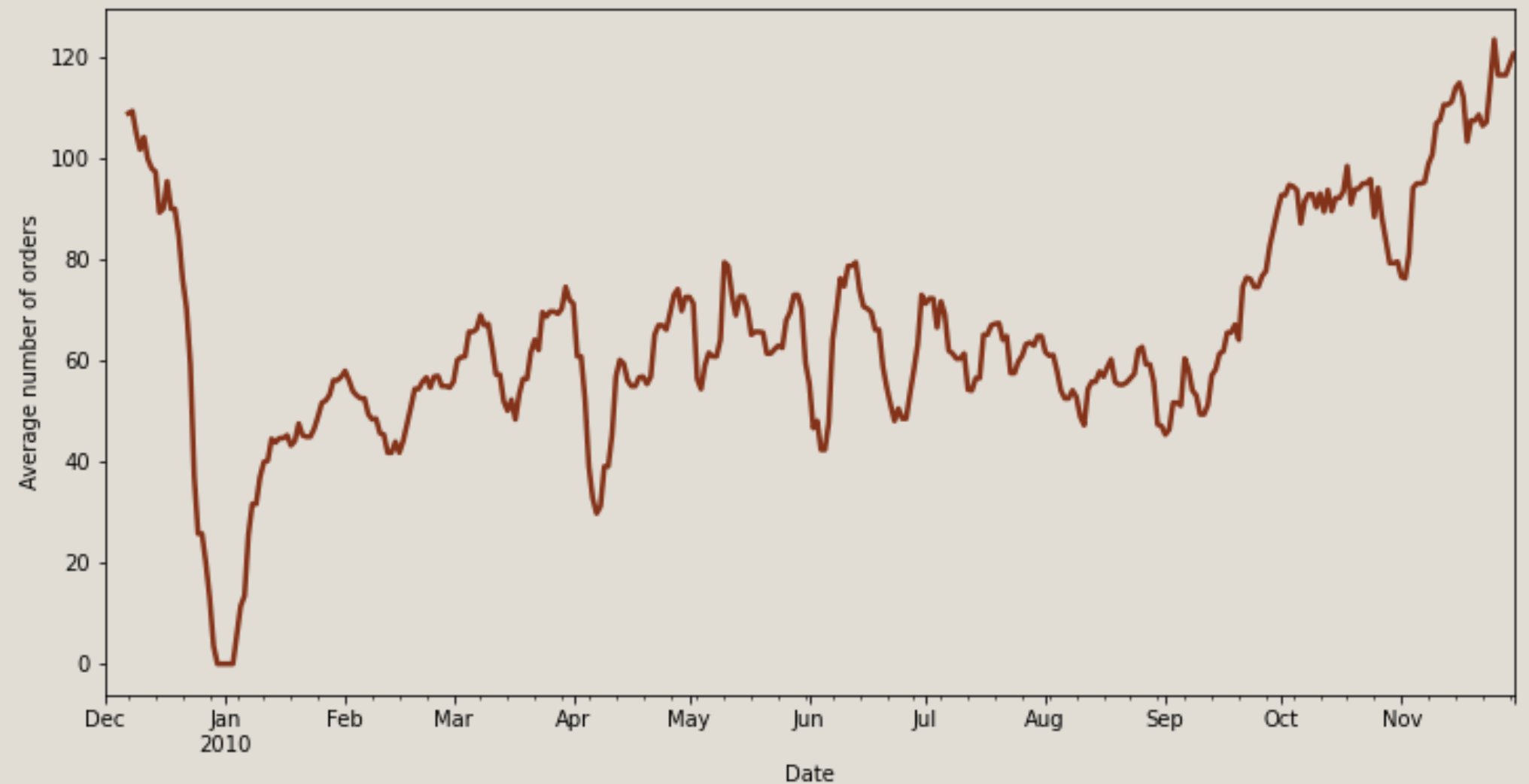
Q & A

Data Analysis

The data

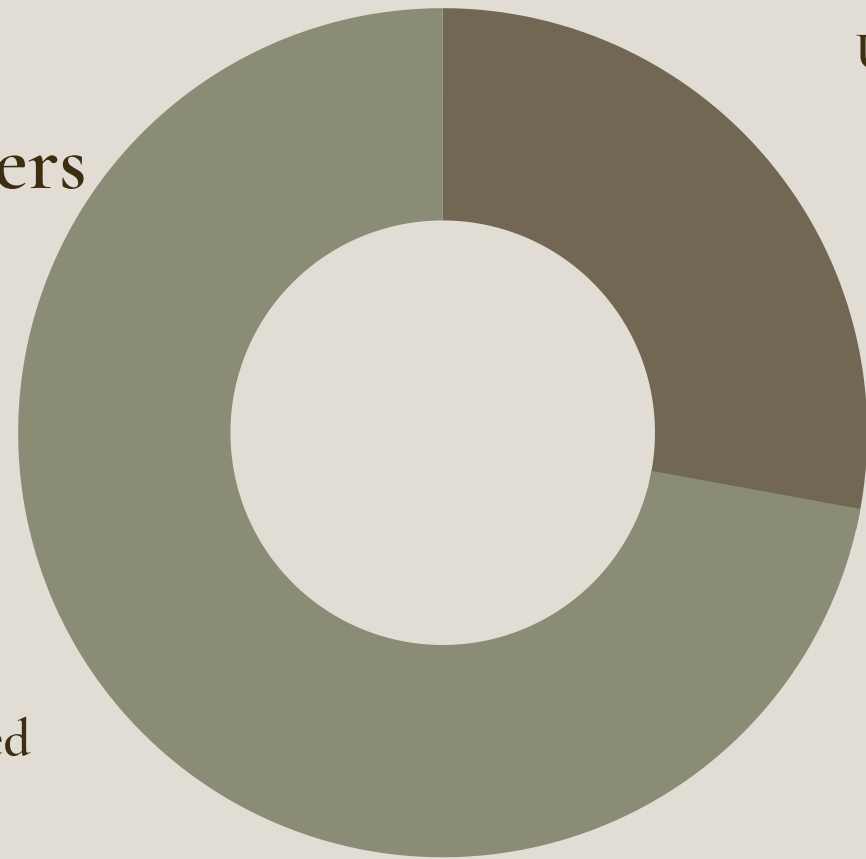
Columns :

- Invoice
- StockCode
- Description
- Quantity
- InvoiceDate
- Price
- CustomerID
- Country



- The retailer is closed on Saturdays, except for the first Saturday of December
- Included returns, postage costs and admin updates
- Customers from 39 countries

Total
Customers



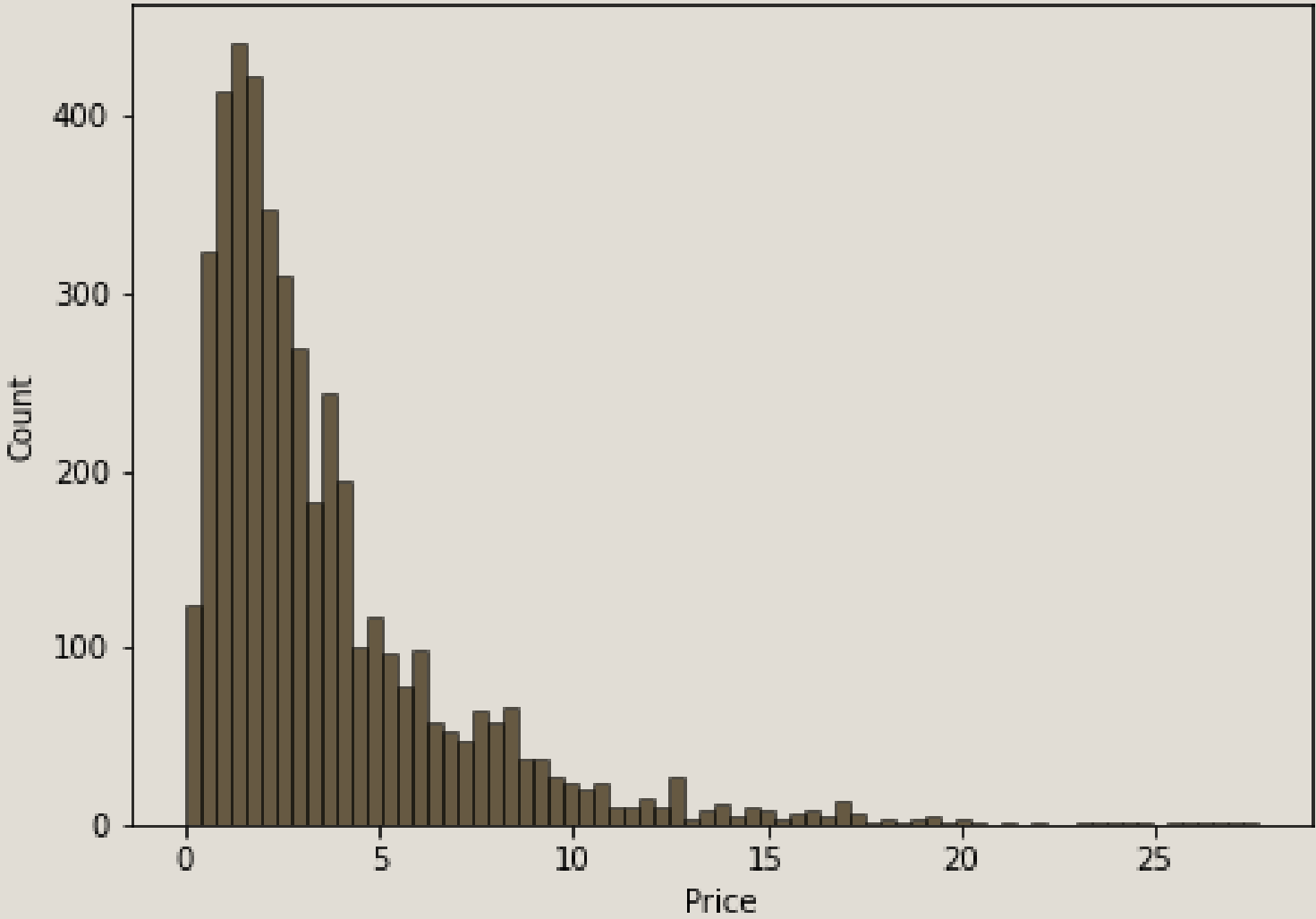
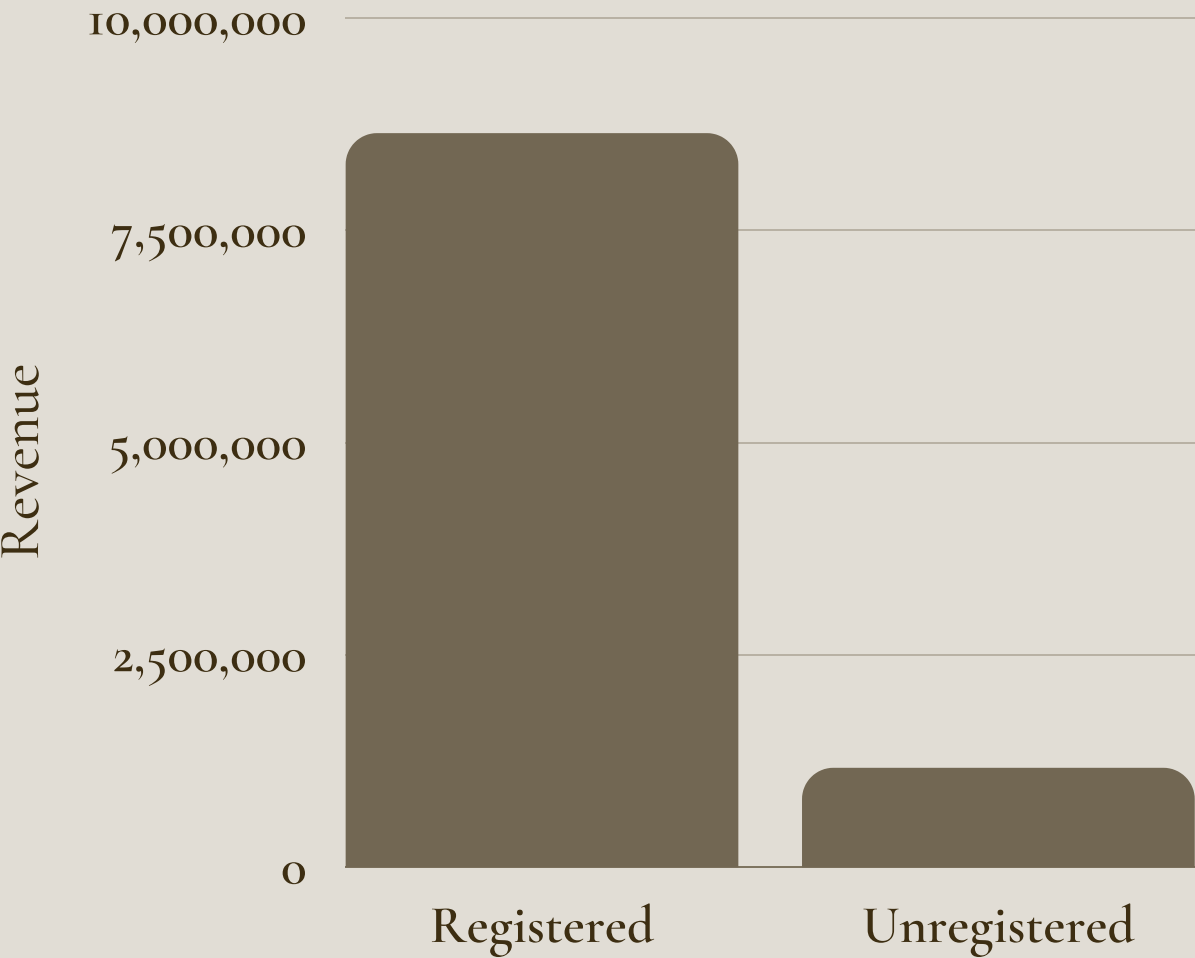
Unregistered
27.9%

Registered
72.1%

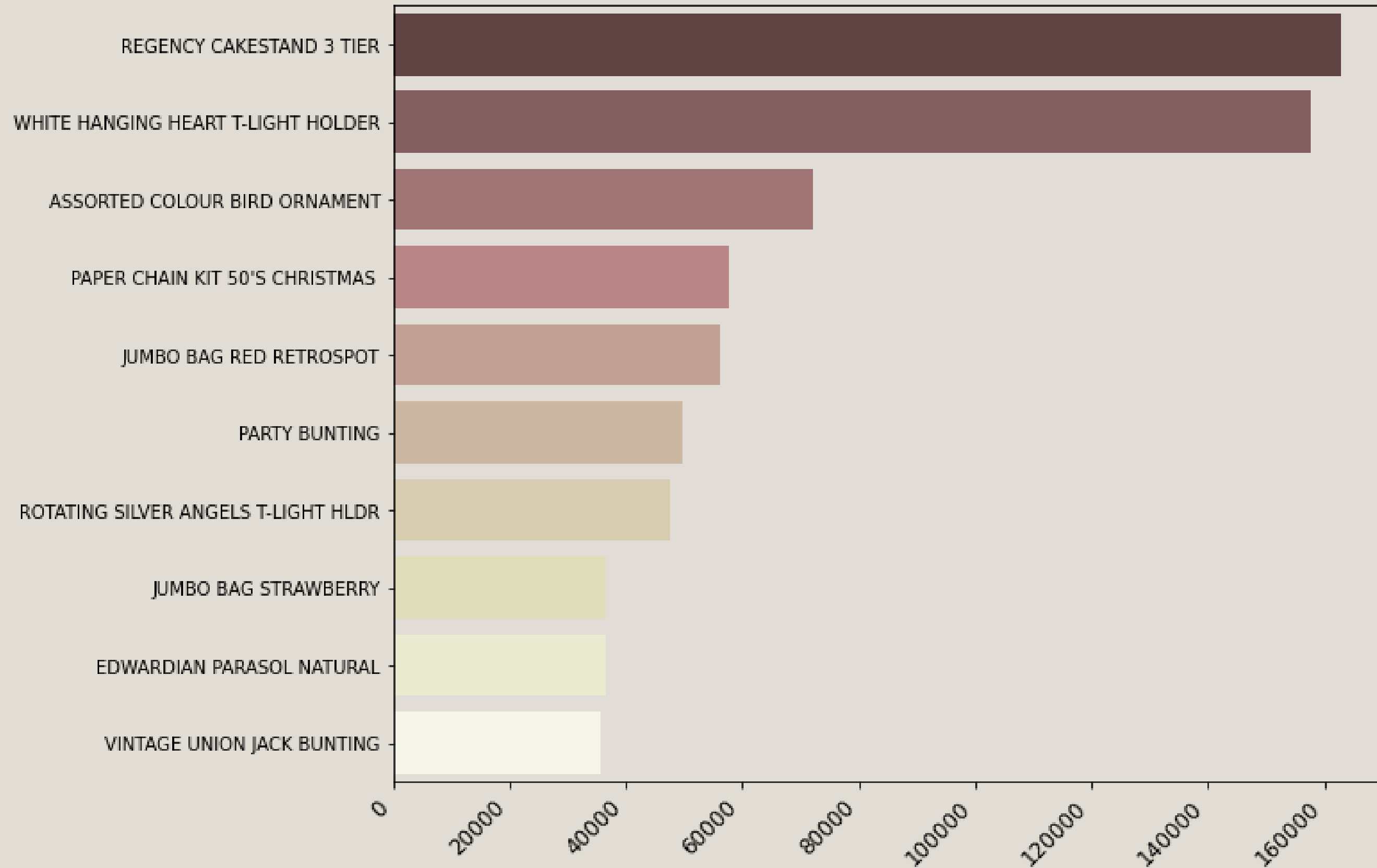
Customers & Products

- The largest orders each consisted of 87167 items across 45 products, purchased by customers 14277 and 13687, at a cost of £11,880.84
- There are 4533 unique products
- 99% of products priced less than £27.67

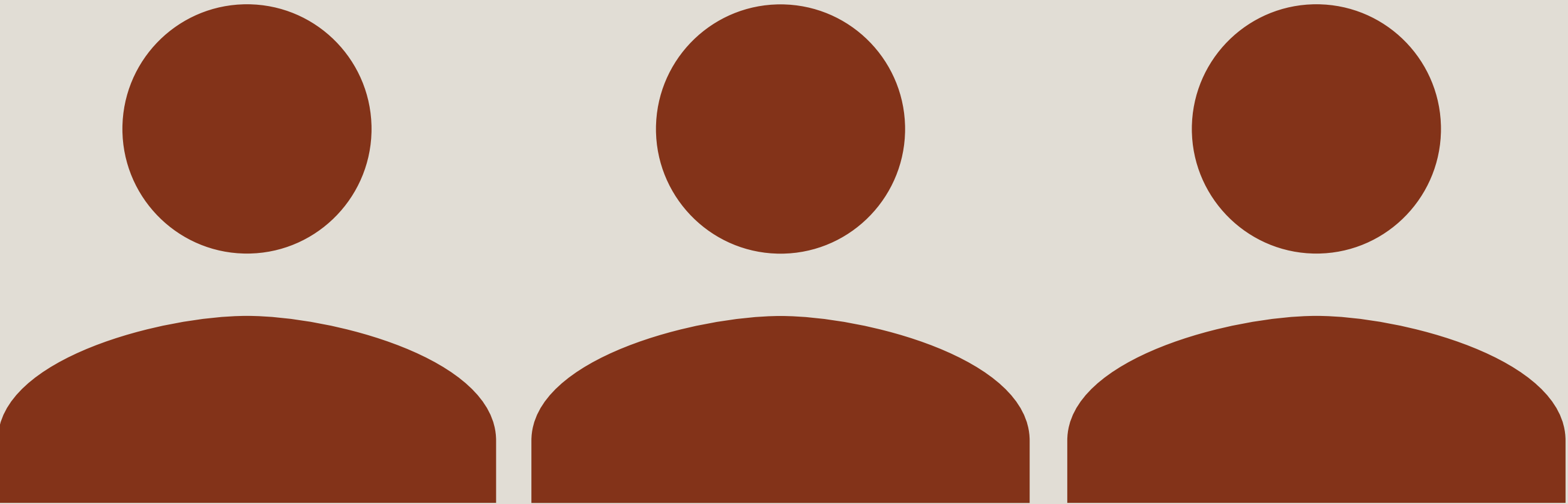
Revenue by Registration



Best Selling Products



Customer Types



Customer Profiles

The Regular Customer

2741 customers
6.3 orders
£2938
82.12%

The One-off Customer

1656 customers
1 order
£703
11.88%

The Low Spending Customer

1544 customers
1.1 orders
£381
6%

Cluster

Number of customers
Number of orders
Yearly spend
Revenue(%)

Preparation

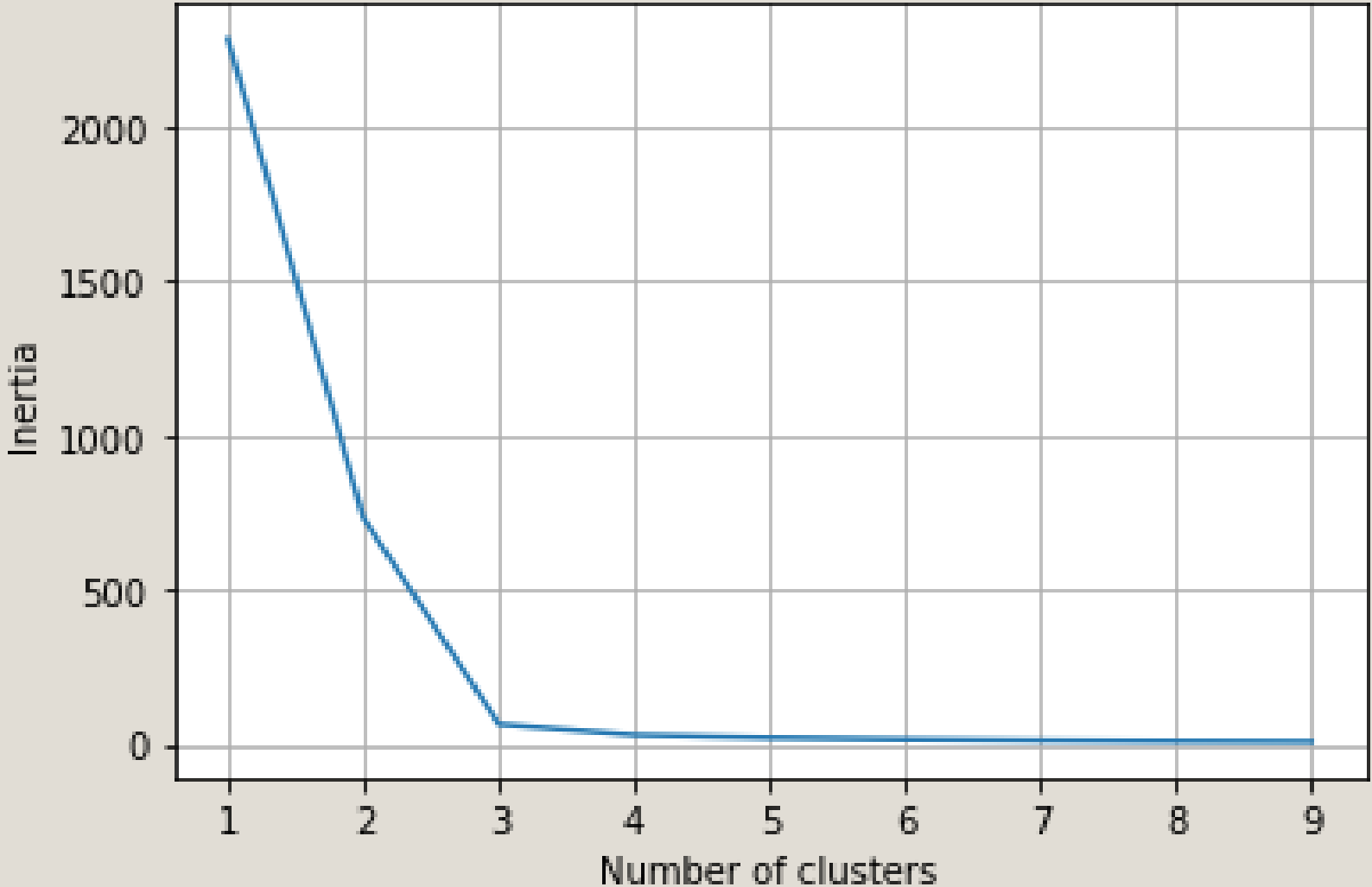
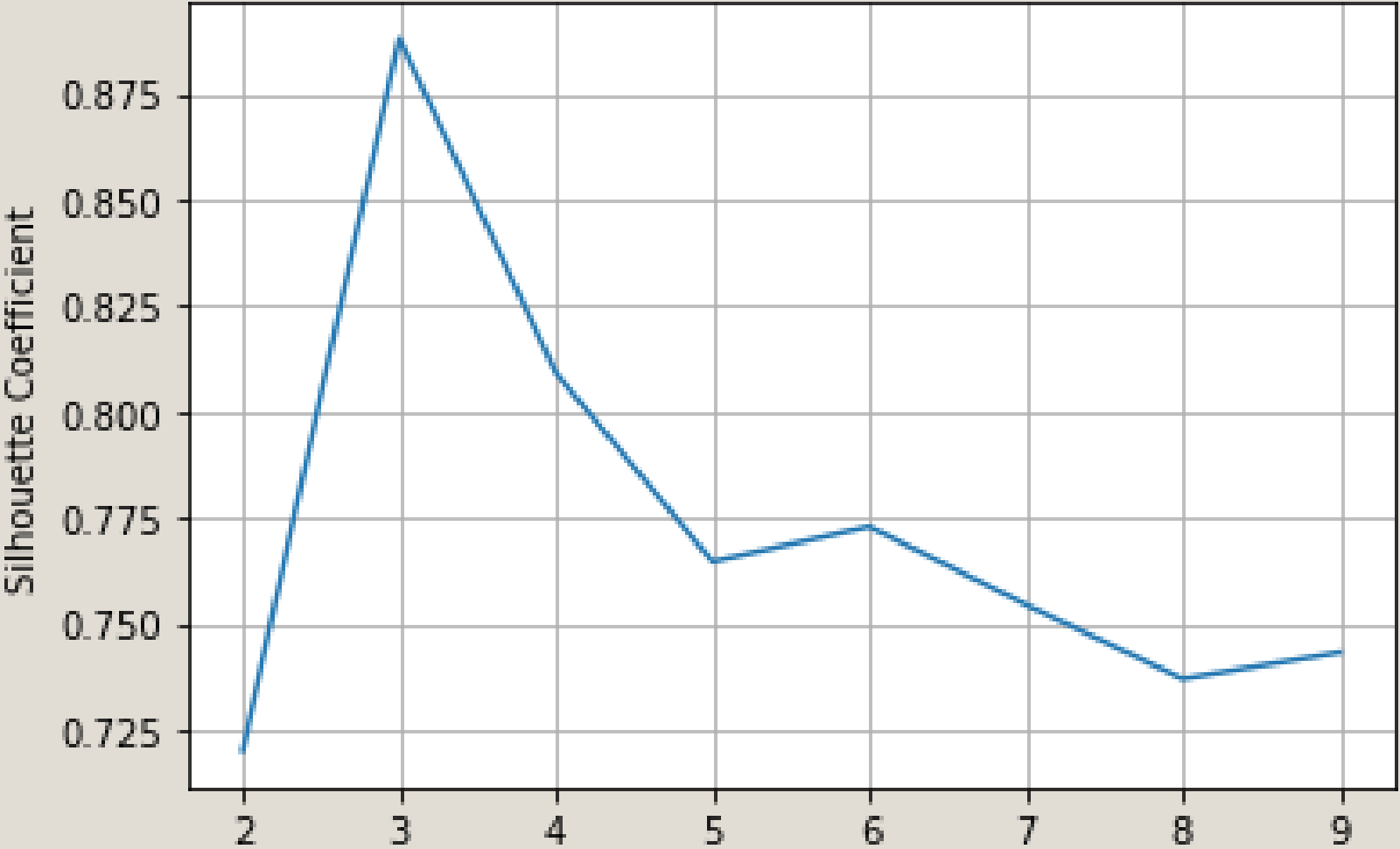
Dropped cancelled orders
Single Customer View
Used MinMax Scaler

Features

Revenue
InvoiceCount
AverageDuration
Registered

Model

Kmeans
3 clusters
Silhouette score = 0.893



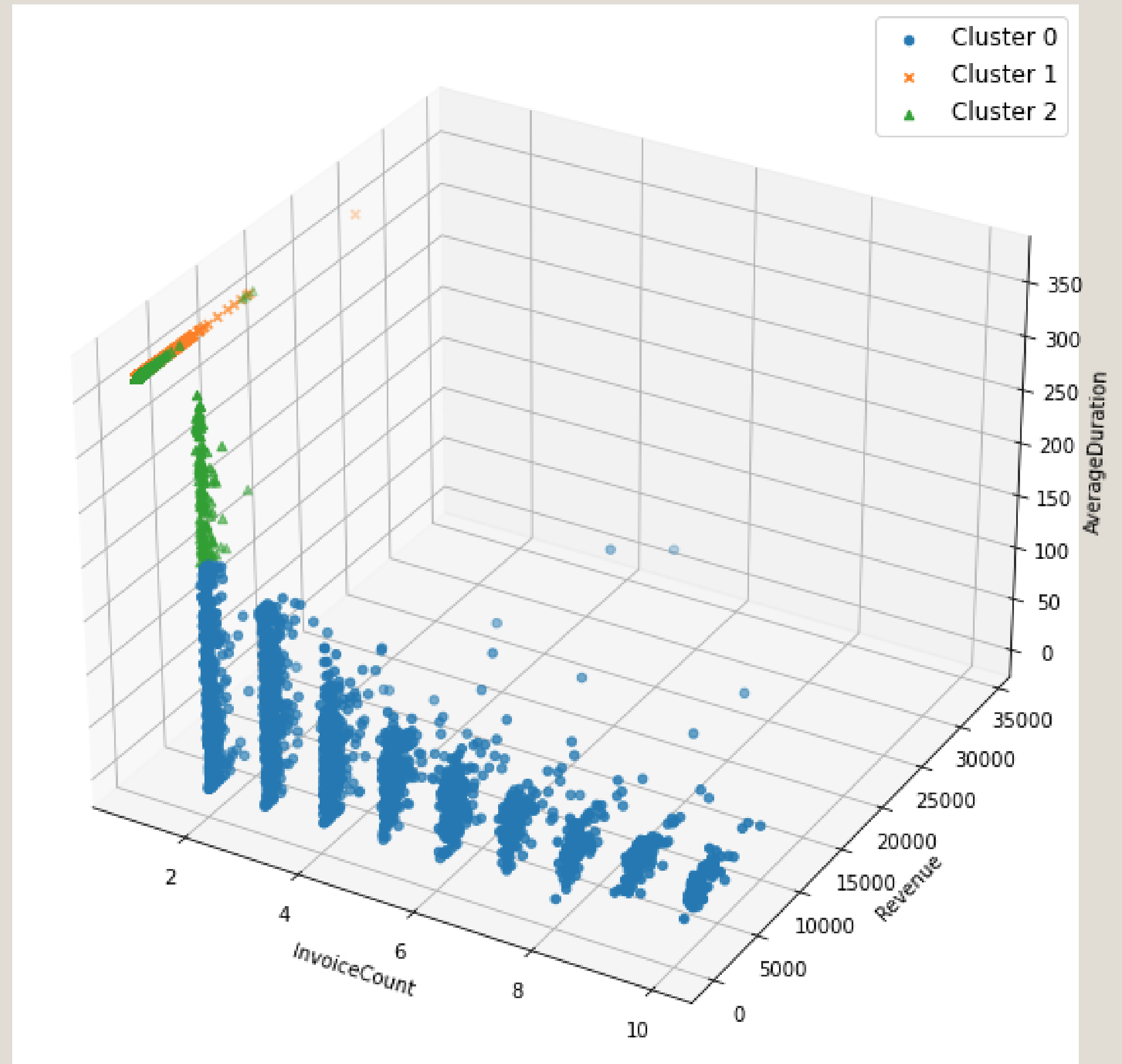
Results

Displaying 5609 customers

Cluster 0 – Regular Customers

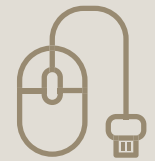
Cluster 1 – One-off Customers

Cluster 2 – Low Spending Customers



Forecasting

Timeseries



Features

InvoiceCount



Time

12 month period from
December 2009



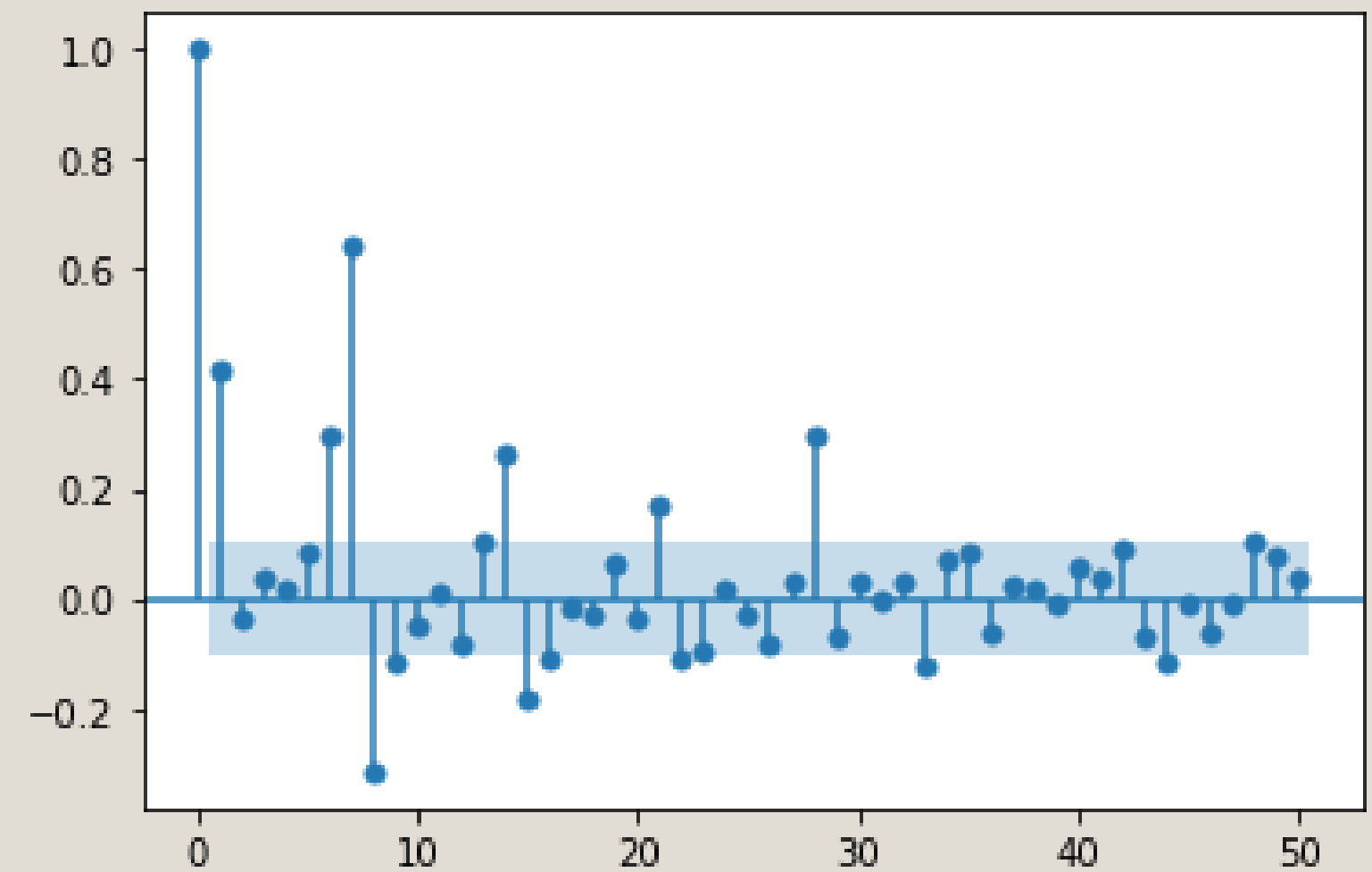
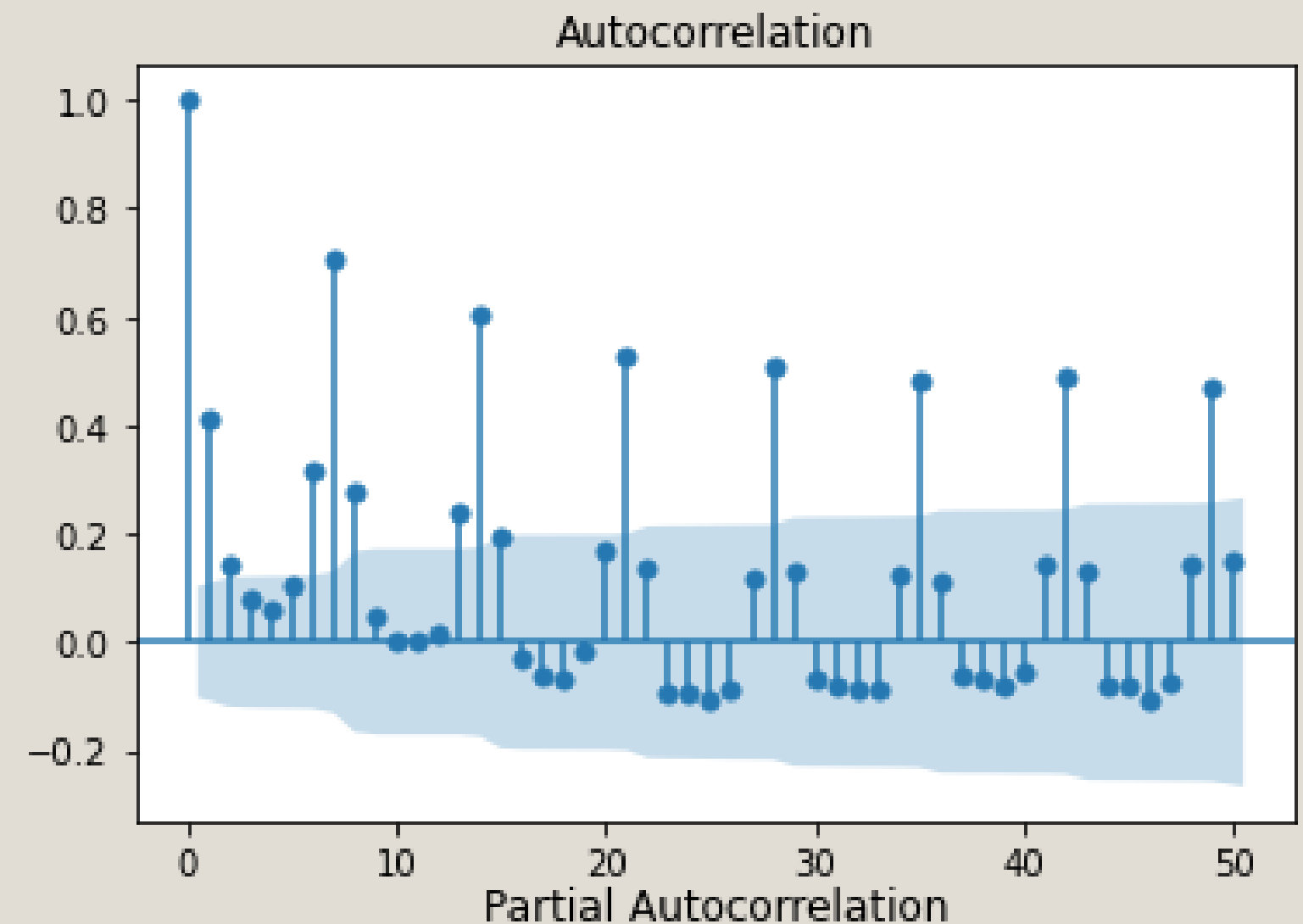
Model

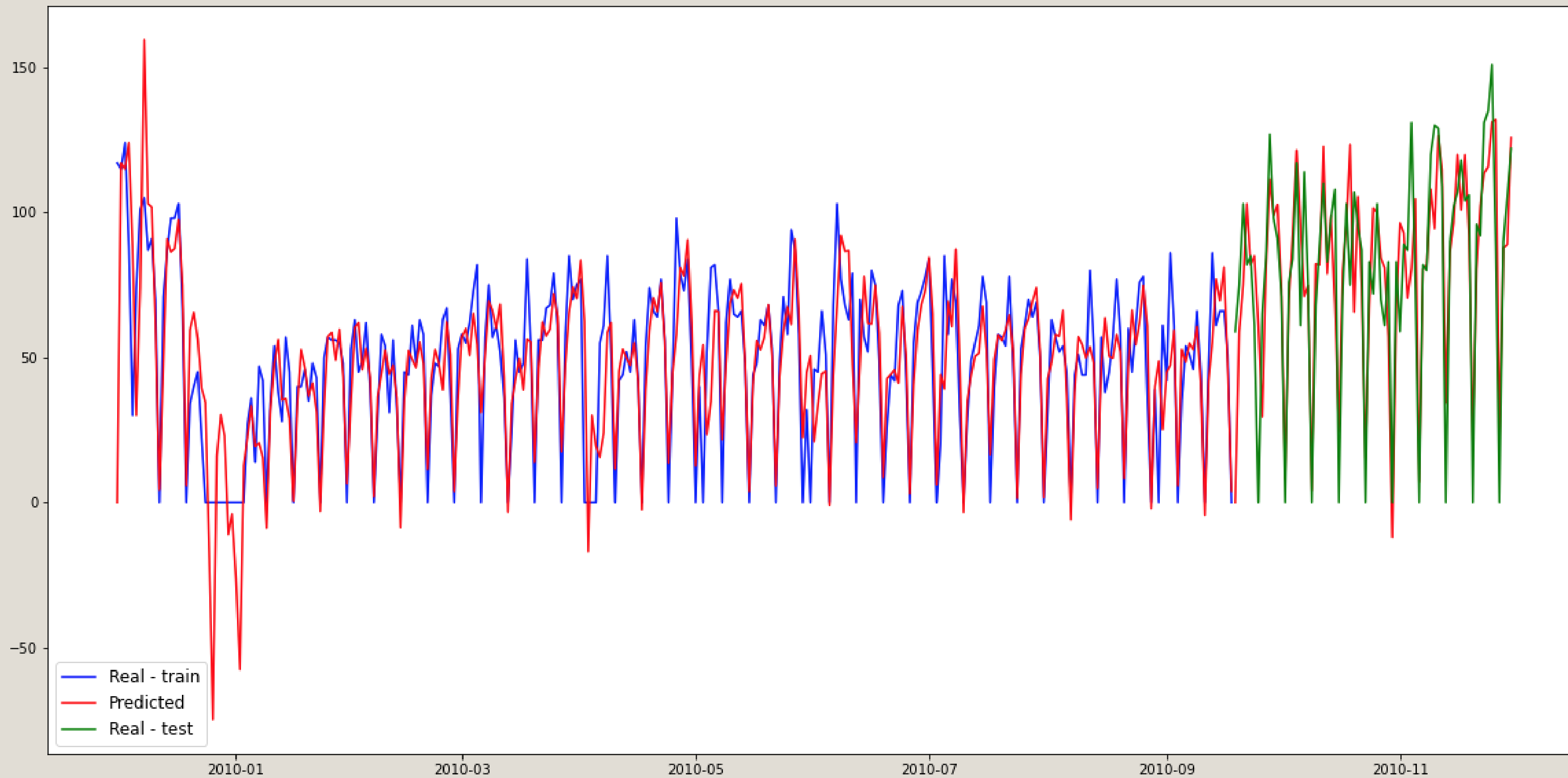
$\text{SARIMAX}(2, 1, 1), (0, 1, 1, 7)$



Evaluation

Rsquared 0.6825





Real vs Predicted

Thank you for listening
