CAPSTONE PROJECT MSBA BUAN 690

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BUSINESS CASE

Customer Segmentation Using RFM Model

The client is an online retailer that sells all kinds of unique gift items. They are planning their marketing activities for the coming year and need insights into their customer profile in order to appropriately plan their sales and marketing strategy to the right customer segment.
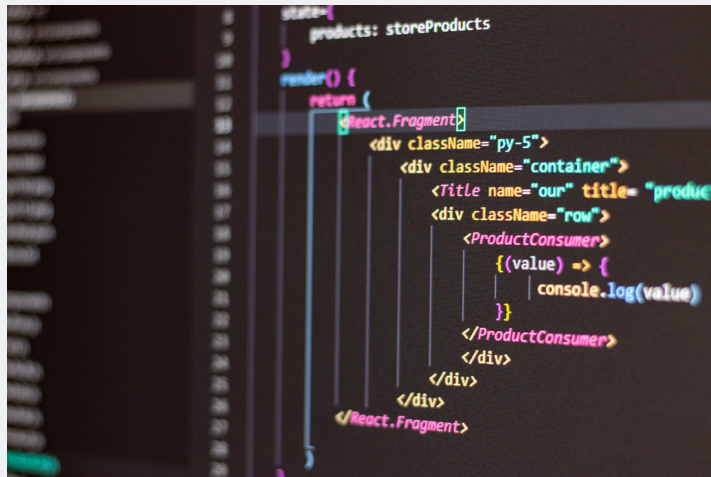
Online Retail Dataset

The Dataset was sourced from UCI and contains **541909** entries and **8** columns that contain the following information;

- Invoice Number
- Stock Code
- Description
- Quantity
- Invoice date
- Unit Price
- Customer Id
- Country

Tools utilized

PYTHON
Data Analysis
Visualization
Cleaning
Modelling

TABLEAU

Visualization

In what country do we have the most sales?

Country	TotalPrice
United Kingdom	8.194778e+06
EIRE	3.522427e+05
Netherlands	2.638634e+05
Germany	1.962904e+05
France	1.307699e+05
Sweden	5.121351e+04
Denmark	4.697295e+04
Switzerland	4.334341e+04
Spain	3.708490e+04
Australia	3.005180e+04

TotalSales By Country

United Kingdom
$8,194,777.53

EIRE
$352,242.73

Netherlands
$263,863.41

Germany
$196,290.35

France

TotalPrice
$37,084.90   8M

The countries with the best sales are the UK, IERE, Netherlands, Germany and France

What products do our customer like best?

Description	TotalPrice	Quantity
WHITE HANGING HEART T-LIGHT HOLDER	157865.43	57733.0
WORLD WAR 2 GLIDERS ASSTD DESIGNS	11310.29	54698.0
BROCADE RING PURSE	8879.82	47647.0
PACK OF 72 RETRO SPOT CAKE CASES	23759.26	46106.0
ASSORTED COLOUR BIRD ORNAMENT	72454.12	44925.0

Best Selling Product by Qty
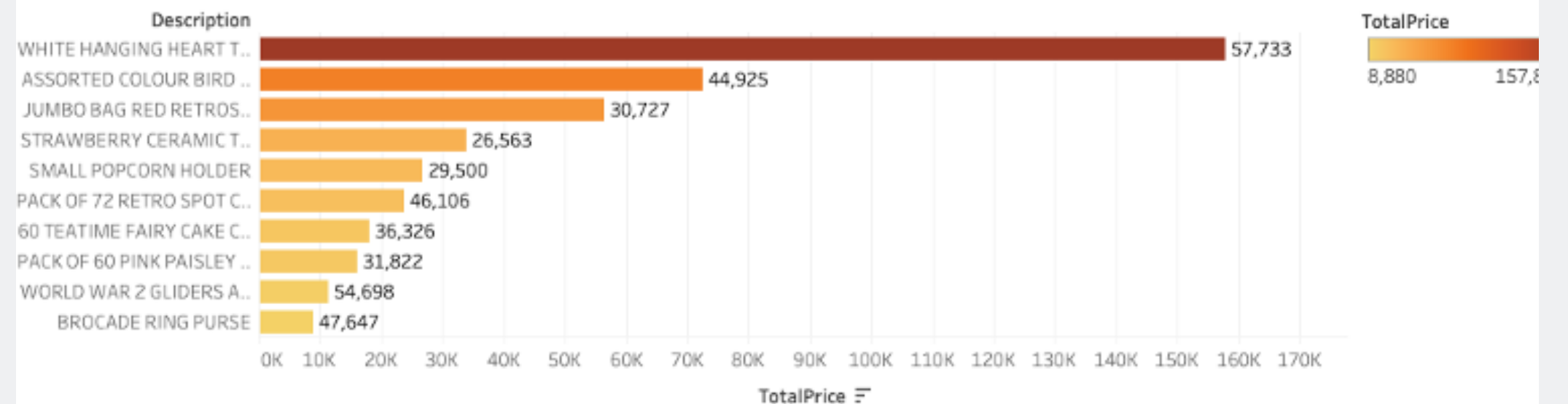
Sum of TotalPrice for each Description. Color shows sum of TotalPrice. The marks are labeled by sum of Quantity. The view is filtered on Description, which has multiple members selected.
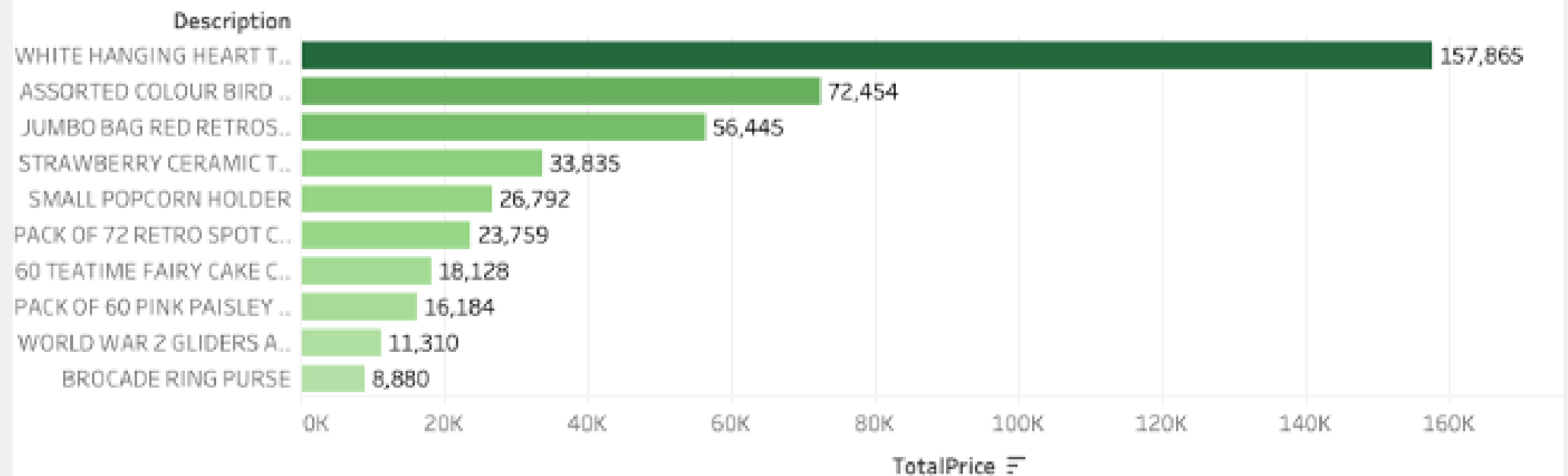
Our best-selling product is the White hanging Heart T-Light Holder, it sold 57,733 pieces and generated $157,865

What product makes us the most money?

Description	TotalPrice	Quantity
REGENCY CAKESTAND 3 TIER	163051.46	13093.0
WHITE HANGING HEART T-LIGHT HOLDER	157865.43	57733.0
DOTCOM POSTAGE	116401.99	731.0
ASSORTED COLOUR BIRD ORNAMENT	72454.12	44925.0
PAPER CHAIN KIT 50'S CHRISTMAS	57870.20	17083.0
JUMBO BAG RED RETROSPOT	56444.61	30727.0
PARTY BUNTING	49645.52	10088.0
ROTATING SILVER ANGELS T-LIGHT HLDR	47672.49	13675.0
POSTAGE	46092.36	2154.0
JUMBO BAG STRAWBERRY	36699.61	19985.0

Best Grossing Product

Description	TotalPrice
WHITE HANGING HEART T..	157,865
ASSORTED COLOUR BIRD ..	72,454
JUMBO BAG RED RETROS..	56,445
STRAWBERRY CERAMIC T..	33,835
SMALL POPCORN HOLDER	26,792
PACK OF 72 RETRO SPOT C..	23,759
60 TEATIME FAIRY CAKE C..	18,128
PACK OF 60 PINK PAISLEY ..	16,184
WORLD WAR 2 GLIDERS A..	11,310
BROCADE RING PURSE	8,880

Sum of TotalPrice for each Description. Color shows sum of TotalPrice. The marks are labeled by sum of TotalPrice. The view is filtered on Description, which has multiple members selected.

Our highest grossing product is the Regency Cakestand which sold 13,093 pieces but generated $163,051

What was the best and worst months of sales and how much did we make?

Based on revenue, November ($1.4m)and December ($1.1m) respectively, are the best selling months of the year.

July ($533m) is the worst month of sales

July would be a great time to run a sales or discount campaign

Highest Selling Month

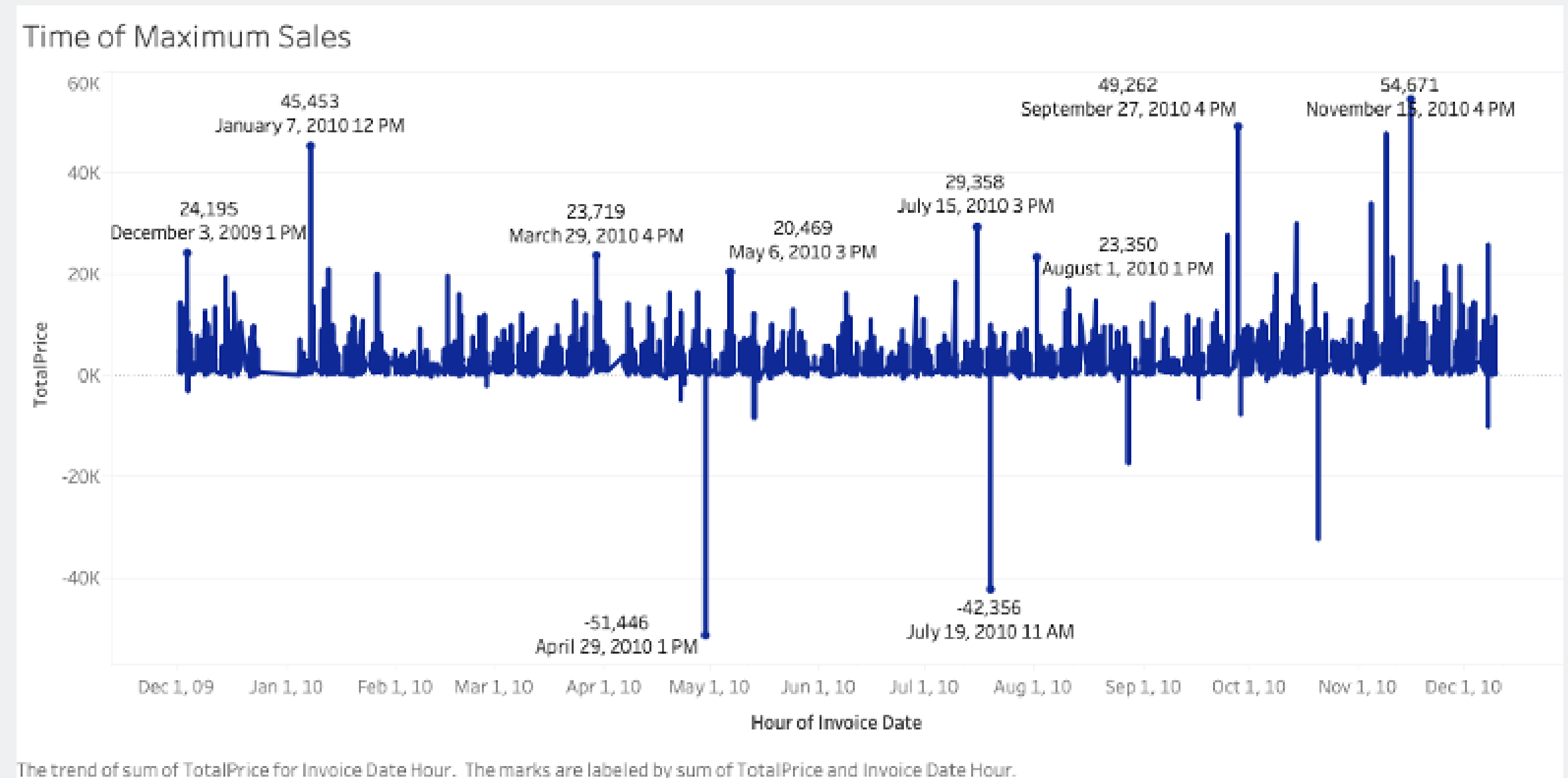The trend of Quantity for Invoice Date Month. Color shows TotalPrice.
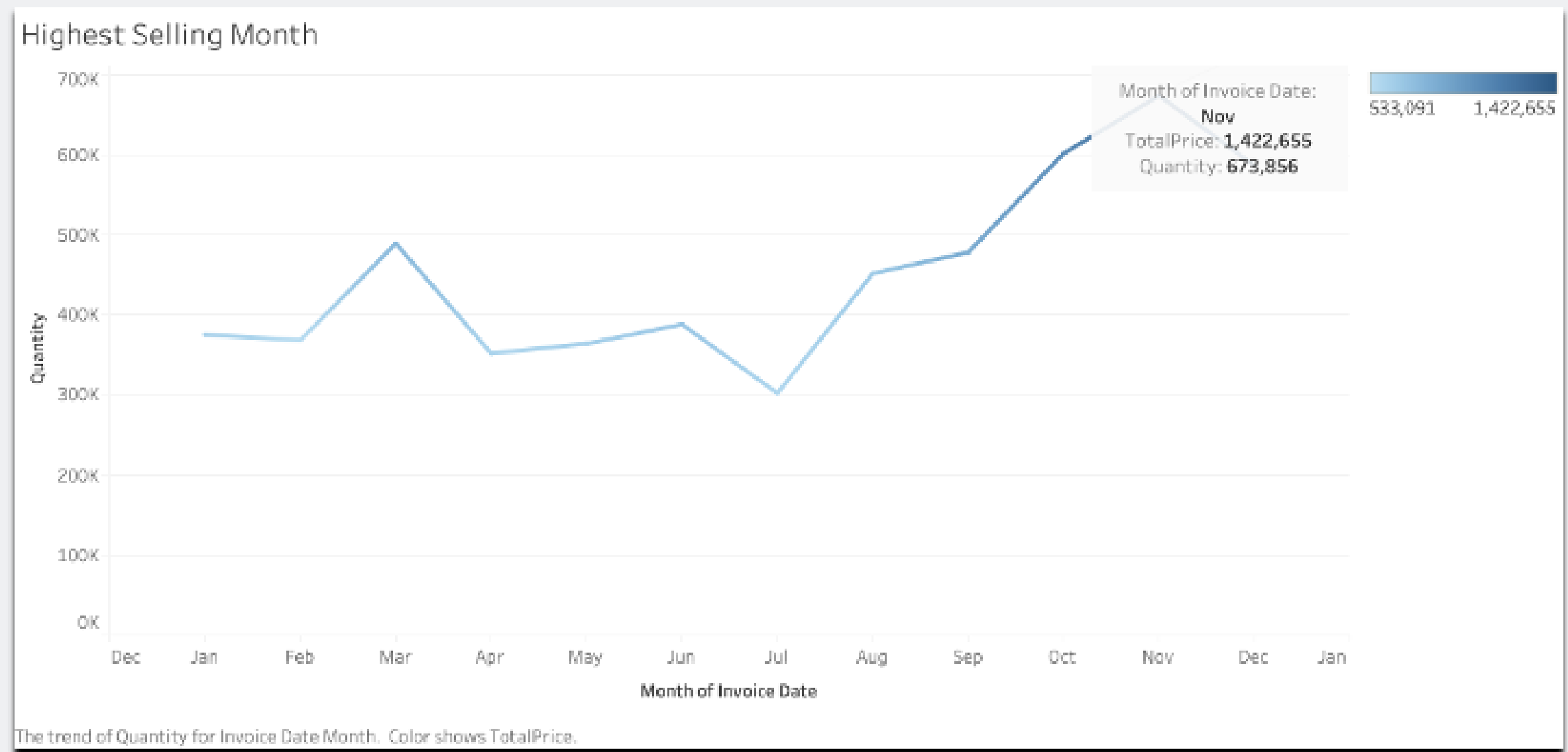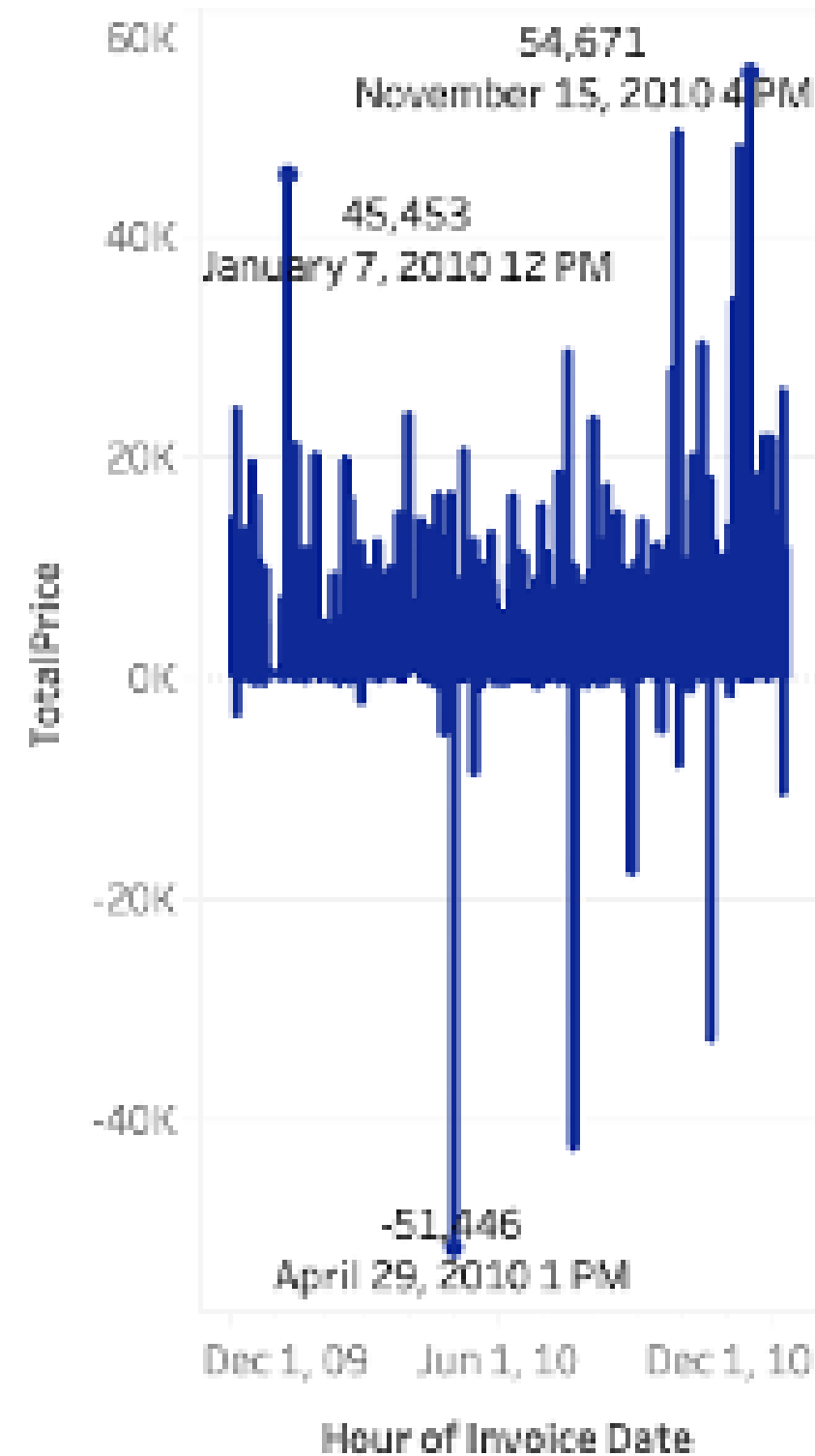
When do our customers spend the most money online?

This would make the most appropriate time of the day to display advertising and maximize the likelihood of customers buying

Time	TotalPrice
16:02:00	67594.05
16:45:00	63098.05
12:34:00	62239.45
09:46:00	61764.16
11:36:00	58172.32
...	...
15:04:00	-5170.00
16:52:00	-15673.65
12:04:00	-24155.04
11:24:00	-25912.16
13:36:00	-30609.46

Time of Maximum Sales

The trend of sum of TotalPrice for Invoice Date Hour. The marks are labeled by sum of TotalPrice and Invoice Date Hour.
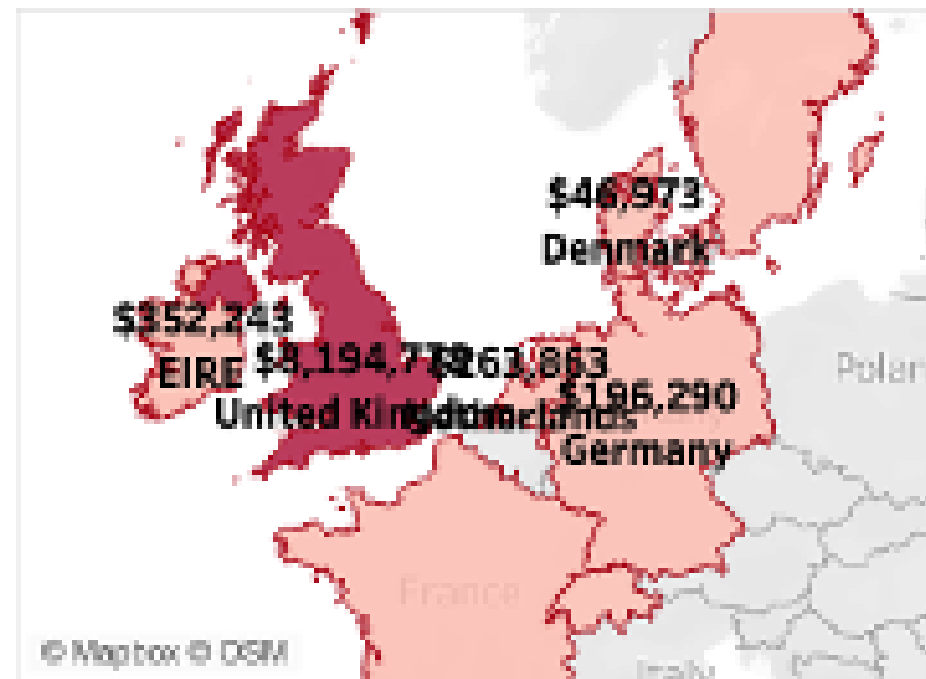
Our best sales are by **4PM - 4:02PM**
Worst sales is by **1:36PM**

Time of Maximum Sales

54,671
November 15, 2010 4 PM

45,453
January 7, 2010 12 PM

-51,446
April 29, 2010 1 PM

Hour of Invoice Date

TotalSales By Country

$46,973
Denmark

$352,243
EIRE

$4,194,713 $261,863
United Kingdom Netherlands

$196,290
Germany

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Best Grossing Product

TotalPrice
37K   8M

Description	TotalPrice
WHITE HANGING HEART T..	157,865
ASSORTED COLOUR BIRD ..	72,454
JUMBO BAG RED RETROS..	56,445
STRAWBERRY CERAMIC T..	33,835
SMALL POPCORN HOLDER	26,792
PACK OF 72 RETRO SPOT C..	23,759

0K   100K   200K

TotalPrice

Highest Selling Month

Month of Invoice Date

Best Selling Product by Qty

Description	TotalPrice
WHITE HANGING HEART T..	57,733
ASSORTED COLOUR BIRD ..	44,925
JUMBO BAG RED RETROS..	30,727
STRAWBERRY CERAMIC T..	26,563
SMALL POPCORN HOLDER	29,500
PACK OF 72 RETRO SPOT C..	46,106

0K   100K   200K

TotalPrice

Implementing the RFM Model for Customer Segmentation

Using the Recency, Frequency and, Monetary value model, we got the quartile for each element and used it to create a Customer group.

Customer ID	monetary	frequency	recency	r_quartile	f_quartile	m_quartile	RFM_Group
12346.0	431	46	-64	1	2	2	122
12347.0	367	71	1323	3	2	4	324
12348.0	438	20	222	1	3	2	132
12349.0	407	107	2646	4	1	3	413
12351.0	375	21	300	2	3	4	234

What this tells us about our Customer Segments

RFM_Group Marketing Analysis

| Segment	RFM	Description	Marketing
Best Customers	111	Bought most recently and most often, and spend the most	No price incentives, new products, and loyalty programs
Loyal Customers	X1X	Buy most frequently	Use R and M to further segment
Big Spenders	XX1	Spend the most	Market your most expensive products
Almost Lost	311	Haven't purchased for some time, but purchased frequently and spend the most	Aggressive price incentives
Lost Customers	411	Haven't purchased for some time, but purchased frequently and spend the most	Aggressive price incentives
Lost Cheap Customers	444	Last purchased long ago, purchased few, and spent little	Don't spend too much trying to re-acquire

What does the data say?

Most of our customers fall between big spenders and those who do not buy frequently. We can break them down further based on their level of loyalty to different customer group
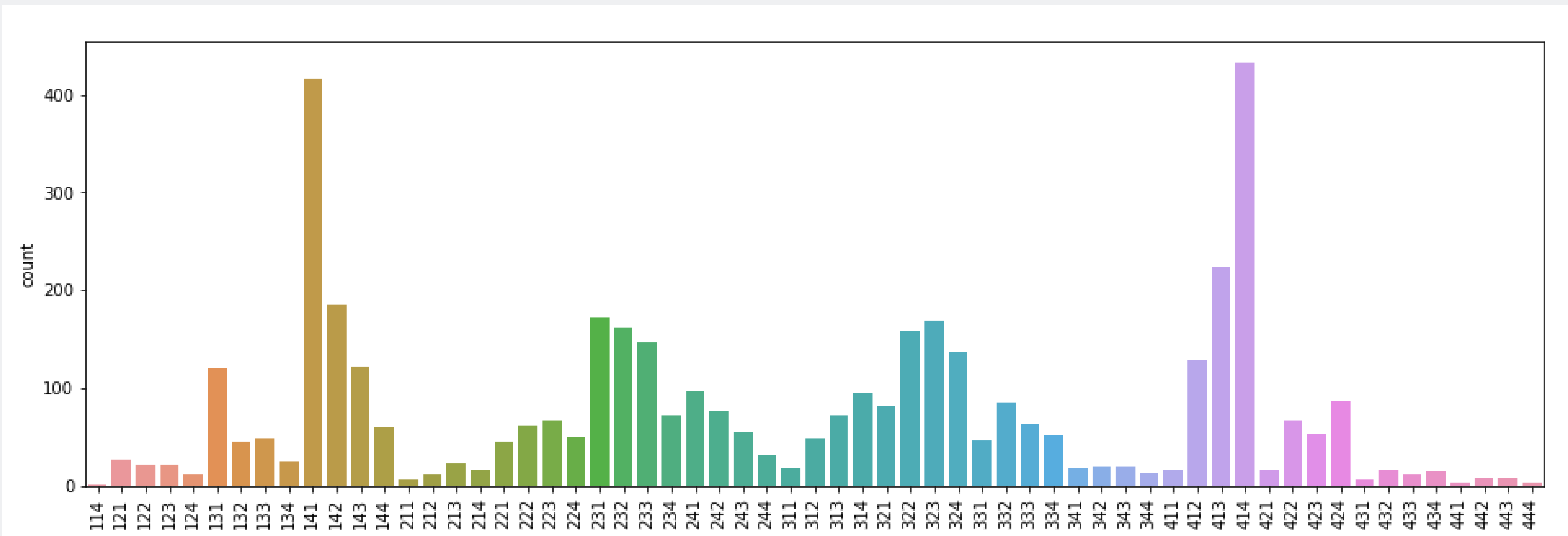
Our most valued customers have an RFMScore of 4 & 5

Our most valued customers are less than 5% of our entire customer base
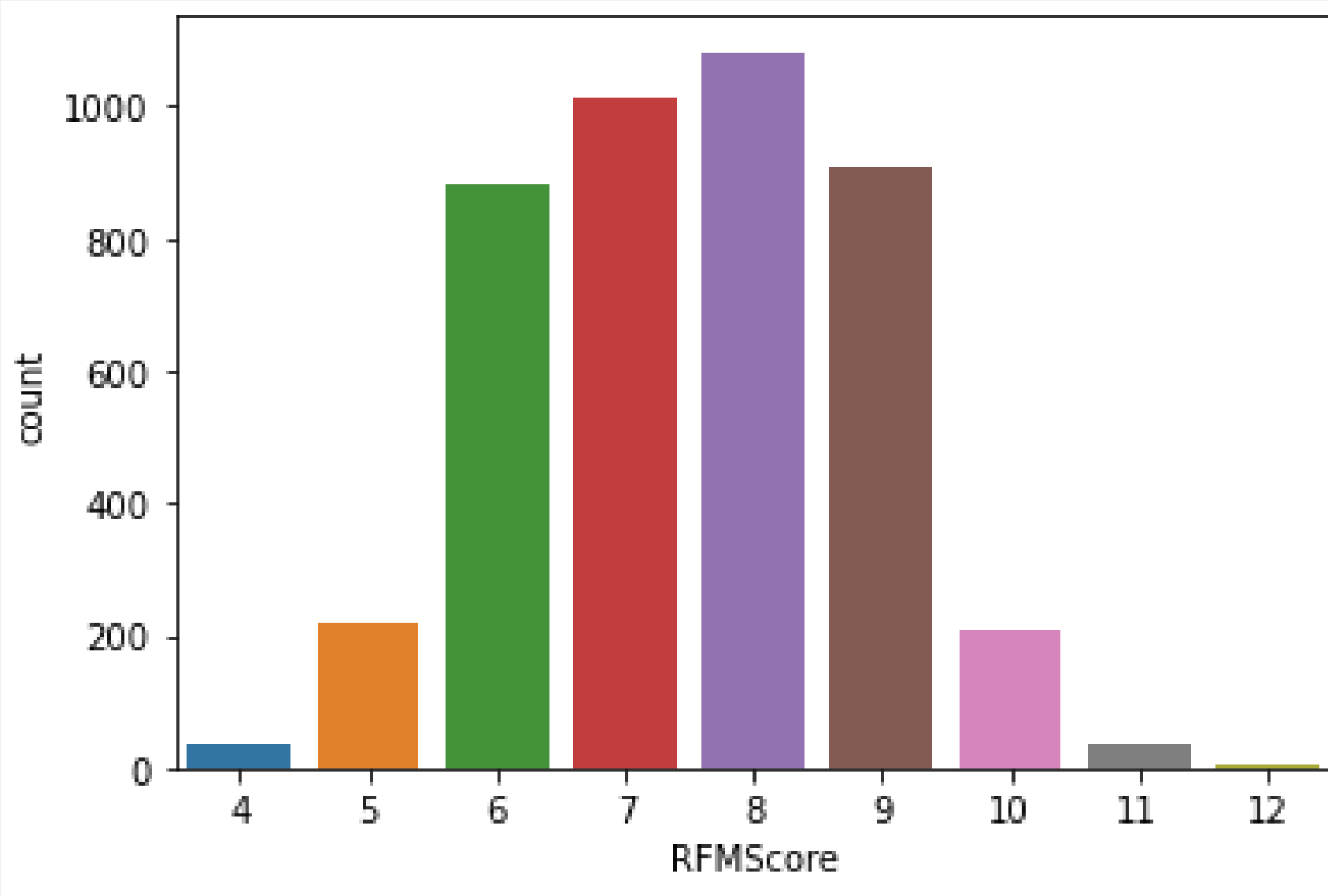
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12346.0	431	46	-64	1	2	2	122	5
12347.0	367	71	1323	3	2	4	324	9
12348.0	438	20	222	1	3	2	132	6
12349.0	407	107	2646	4	1	3	413	8
12351.0	375	21	300	2	3	4	234	9
12352.0	375	18	343	2	4	4	244	10
12353.0	408	20	317	2	3	3	233	8
12355.0	567	22	488	2	3	1	231	6
12356.0	380	84	3562	4	2	4	424	10
12357.0	388	165	12079	4	1	3	413	8

In what category do most of our customers fall?

Silver and Gold!
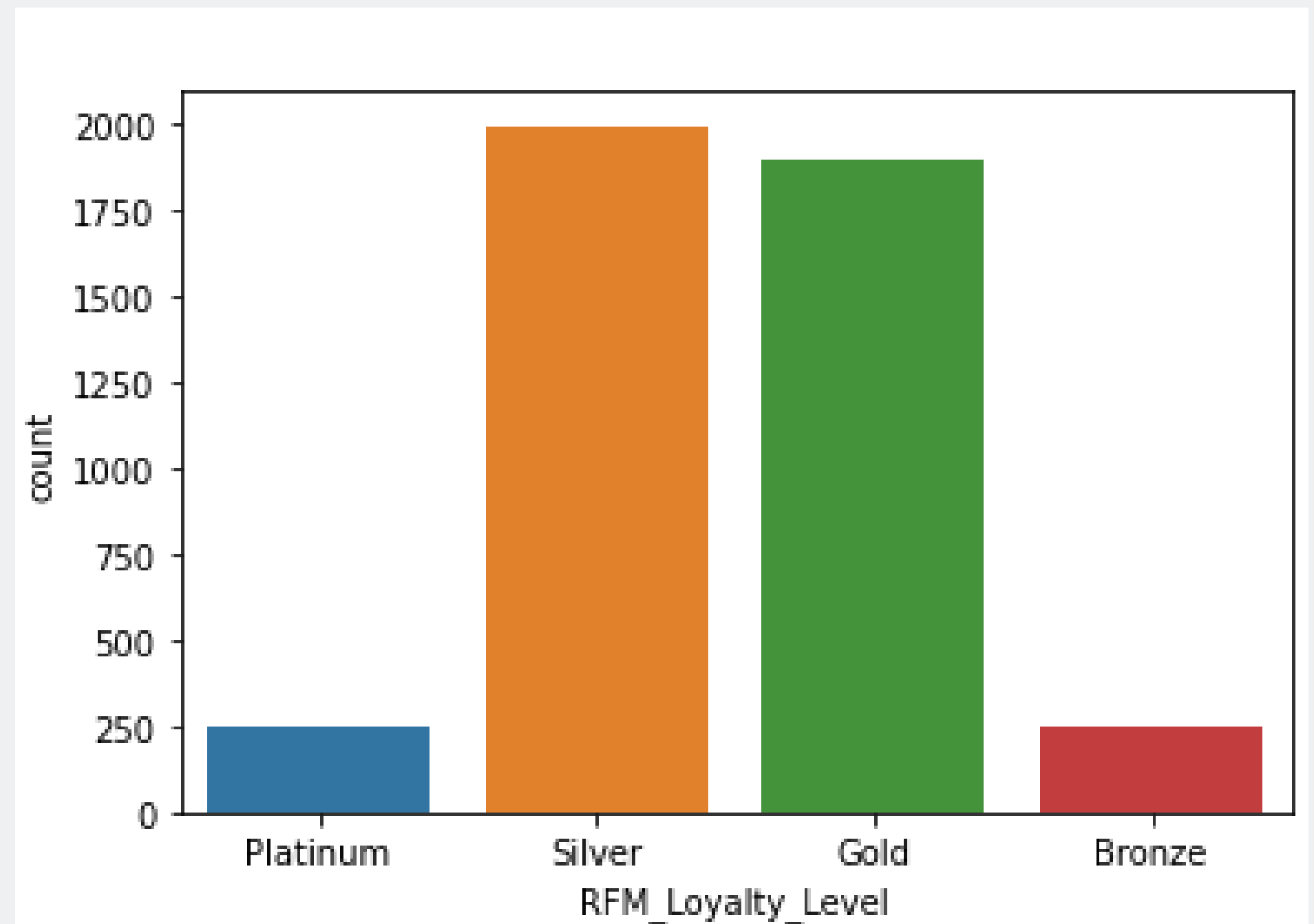
How do we implement?

Platinum - High valued customers (*Reward*)

- Avoid price incentives
- Offer loyalty and rewards/customer retention programs
- Engage regularly i.e emails, events
- Offer high-level customer service

Silver & Gold - One-hit buyers/big spenders (*Keep engaged*)

- Offer price incentives
- Aggressive targeting and remarketing ads
- Consistent engagement and communication i.e social media, emails, newsletters
- Offer referral bonus
- Upsell and cross-sell

Bronze - Gone too soon (*Reacquire*)

- Offer incentives such as free shipping, deep discounts, personalized offers, sampling
- Consistent email sequence for to win them back
- Avoid spending too much to reacquire

References

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Thank you!