# In VODKA We Trust

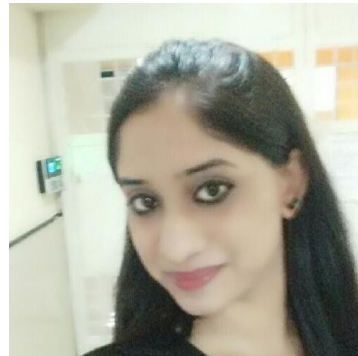# Final project presentation

# BIA 672-A

# (MARKETING ANALYTICS)

## Under the guidance of Prof. Khasha Dehnad

## Presented By:

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# Objectives/Business needs

Use robust marketing analytic strategies like Clustering, Segmentation, Forecasting, Price elasticity, etc. to:

- Provide better ways for liquor stores to make significant profits from vodka sales.

- Provide stores entering the liquor market with a platform to compete with existing stores.

- Help stores at a nascent stage to concentrate on areas in Iowa where they can boost their sales and branding.

- Develop better pricing models for existing and/or new liquor stores.

- Help stores target audience with specific demographic attributes and preferences.

# Target Market - State of IOWA

- Existing retail liquor stores who approach consultants for boosting their sales, profits and customer base

- New retail liquor stores who wish to establish a customer base through the opening of a new store

# Data Source

- The Iowa Department of Commerce requires that every store that sells alcohol in bottled form is required to log every sale of alcohol

- This data is published as open data by the State of Iowa and has been republished as-is on Kaggle

- The analysis is performed on 414193 rows of data for the period of 2014 to 2017

- The dataset contains information on the date of sale, name of the brand, price, quantity, city, number of bottles sold and volume of liquor sold in gallons

# Dataset Variables

Below is a list of all 13 variables in the dataset that we have used for our analysis:

| VARIABLE | DESCRIPTION |
| --- | --- |
| Country | Name of the country (Is for US only) |
| State | Name of the state (Is for Iowa only) |
| City | Name of the city in Iowa |
| Date | Date of sale of liquor |
| Zip Code | Zip code of the area |
| Item Description | Mentions the brand of vodka |
| Pack | Mentions the number of packs sold |
| Bottle Volume (ml) | Volume of bottle |
| State Bottle Cost | Cost of the bottle in state |
| State Bottle Retail | Retail cost of the bottle in state |
| Bottles Sold | Number of bottled sold |
| Sale (Dollars) | Sale price in dollars |
| Volume Sold (Gallons) | Volume of liquor sold in gallons |

# Visualizations

Based on the variables and data described, we have performed marketing analysis on the existing trends of vodka sales of **6 specific brands** viz:

1. Absolut,
2. Svedka,
3. Smirnoff,
4. GreyGoose,
5. New Amsterdam and
6. Five O'Clock

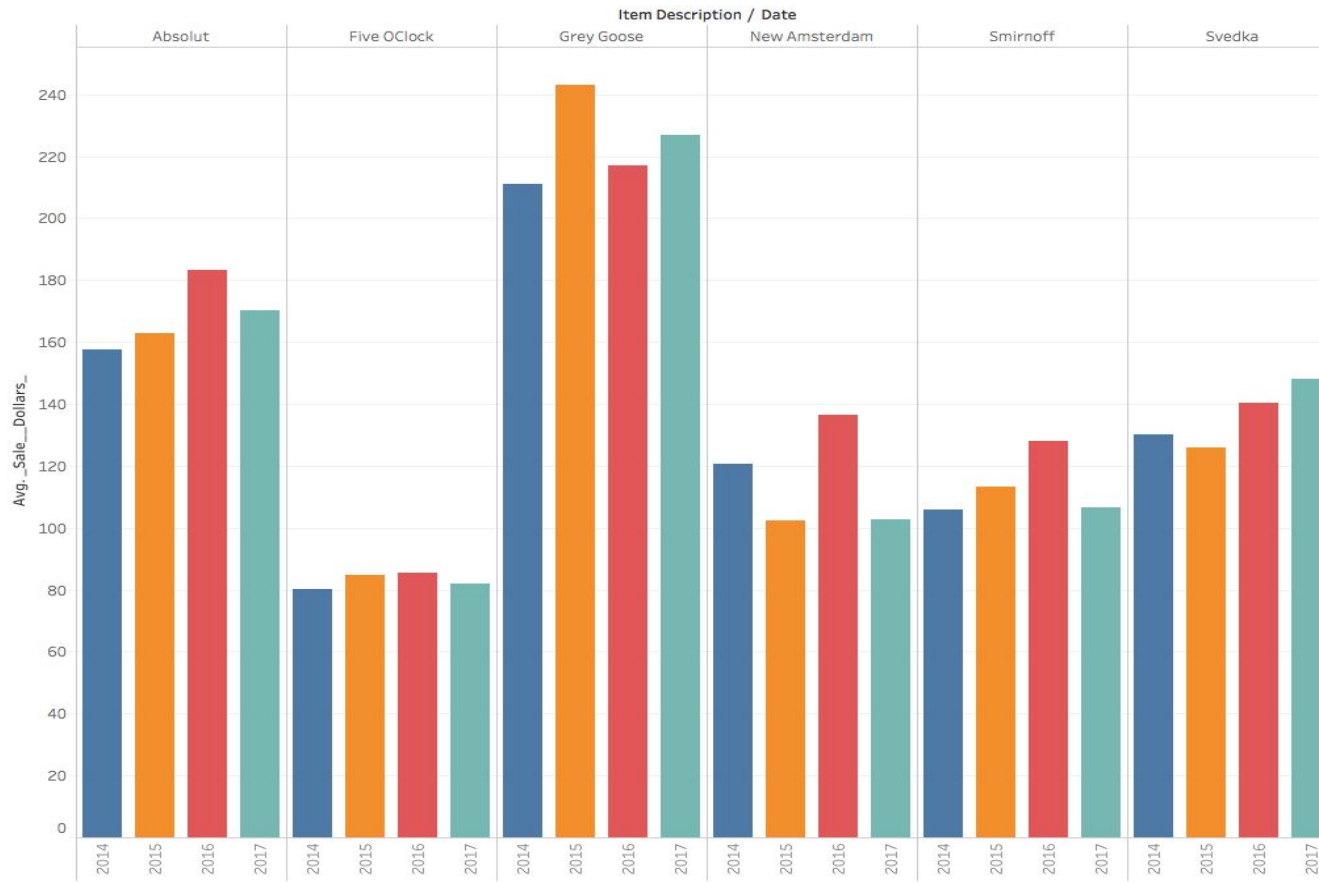in Iowa and provided a few visualizations **for the period 2014 to 2017**

# Average sales per year
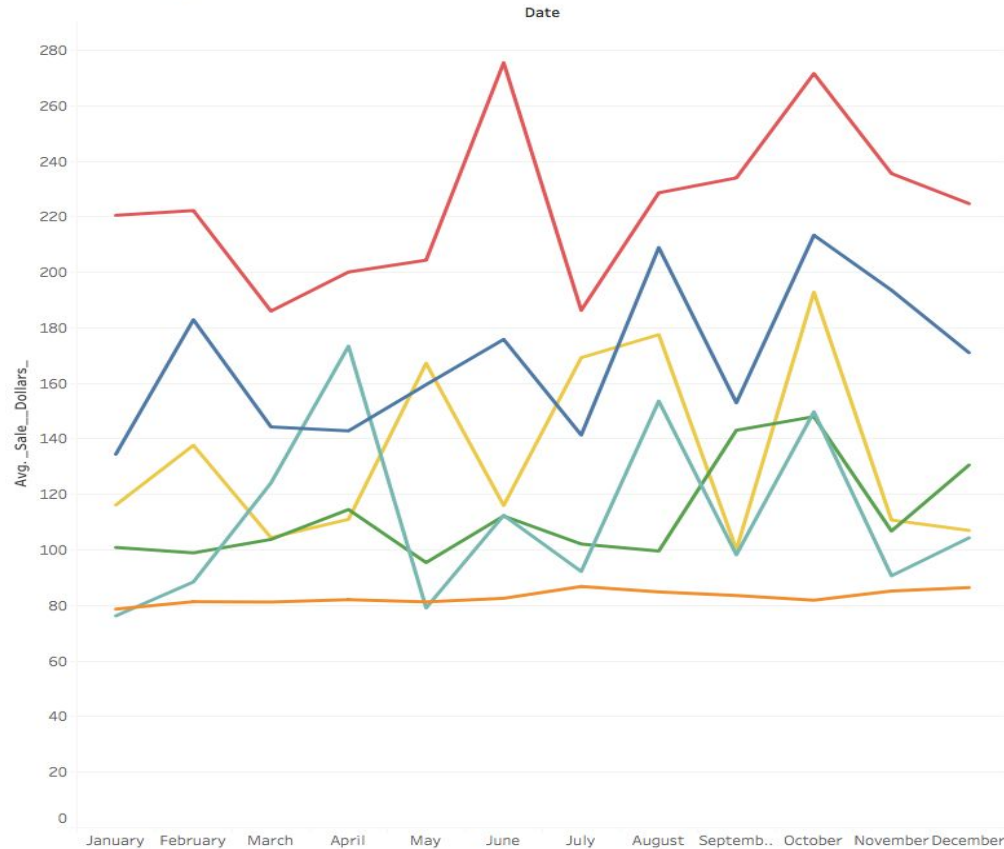


Average Sales per Year (2014-2017)

**Key takeaway:** This graph shows that Grey Goose has the maximum average sale for each of the years in Iowa followed by Absolut. This shows that Grey Goose is a very popular brand in the state even with it's high price

# Average sales per month
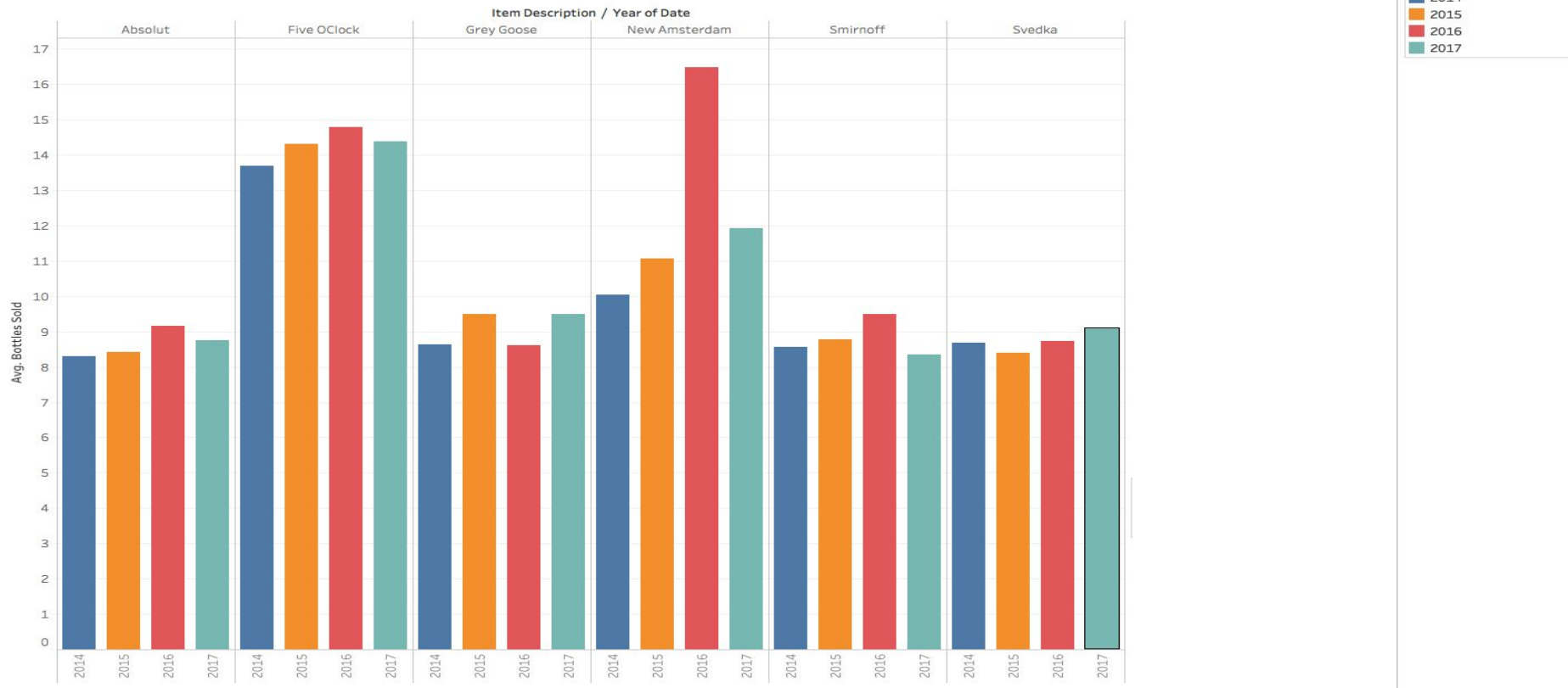


Average Sales per Month (2014-2017)

**Key takeaway:** In this graph, we see that the sales of brands increase dramatically in the summer with Grey Goose the leader in sales followed by Absolut and Svedka

# Average number of bottles sold per year per brand



Average Number of Bottles Sold Per Year Per Brand (2014-2017)
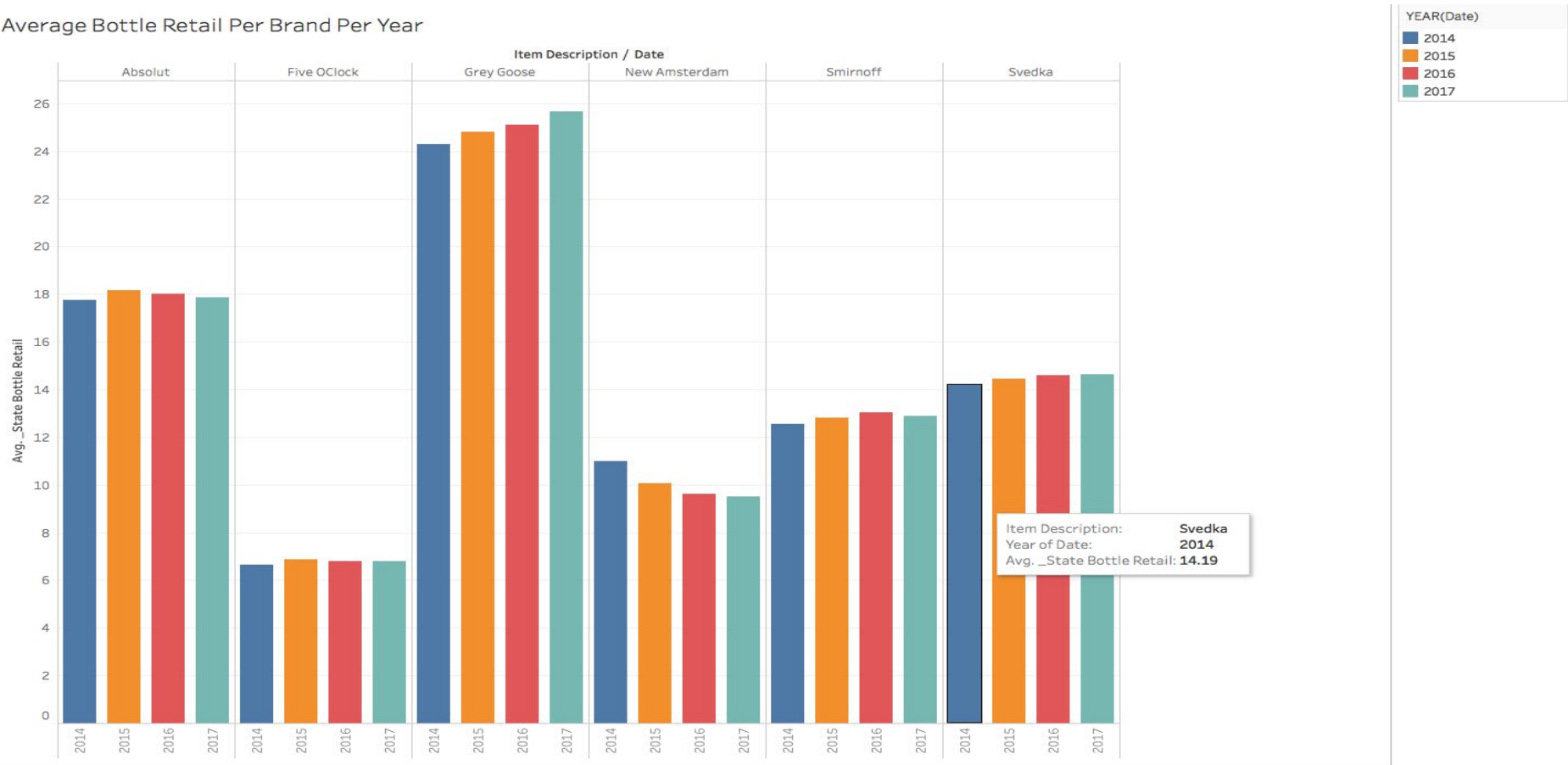
**Key takeaway:** This graph shows that New Amsterdam is the leader since its price is not as high as compared to other brands. Grey Goose being expensive has less number of bottles sold

# Average bottle retail price per brand per year



Average Bottle Retail Per Brand Per Year

Item Description / Date

YEAR(Date)
- 2014
- 2015
- 2016
- 2017

Item Description: Svedka
Year of Date: 2014
Avg. _State Bottle Retail: 14.19

**Key takeaway:** This graph shows us that Grey Goose is the most expensive brand followed by Absolut, Svedka and Smirnoff
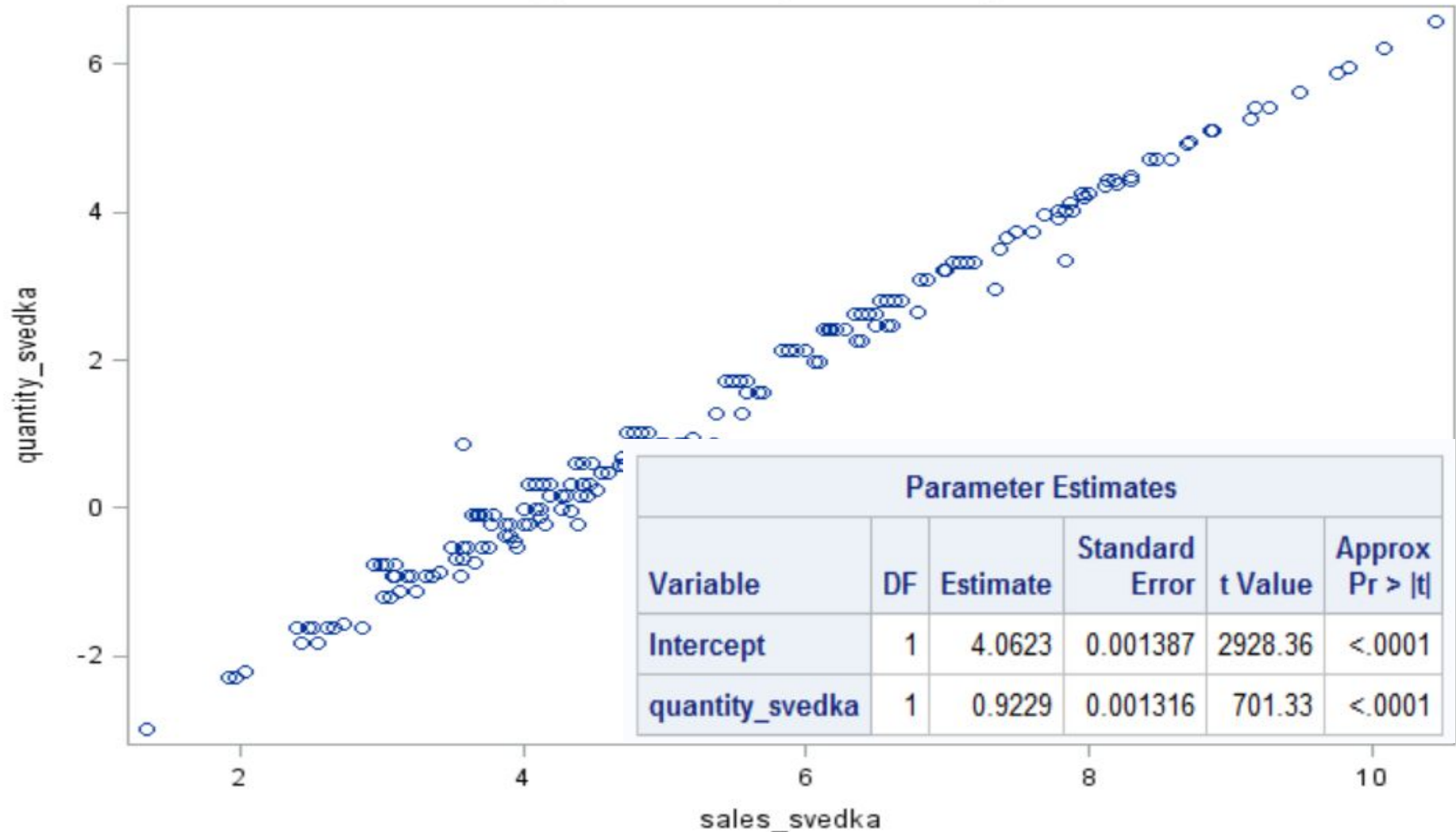
# Price elasticity model

- Price elasticity refers to the market demand of a product in comparison to changing prices. Factors affecting price elasticity include customer, product, competition, etc.

- Here, we have taken log price elasticity for each of the 6 vodka brands and analyzed whether their prices indicate a growth or decline in sales.

- This will help vodka retailers stay ahead of competition and market fluctuations by optimizing pricing and segmenting products.

# Price Elasticity for Svedka vodka



Log price elasticity for svedka_vodka

| Parameter Estimates | | | | | |
|---|---|---|---|---|---|
| Variable | DF | Estimate | Standard Error | t Value | Approx Pr > \|t\| |
| Intercept | 1 | 4.0623 | 0.001387 | 2928.36 | <.0001 |
| quantity_svedka | 1 | 0.9229 | 0.001316 | 701.33 | <.0001 |

# Price Elasticity for GreyGoose

Log price elasticity for GreyGoose_vodka



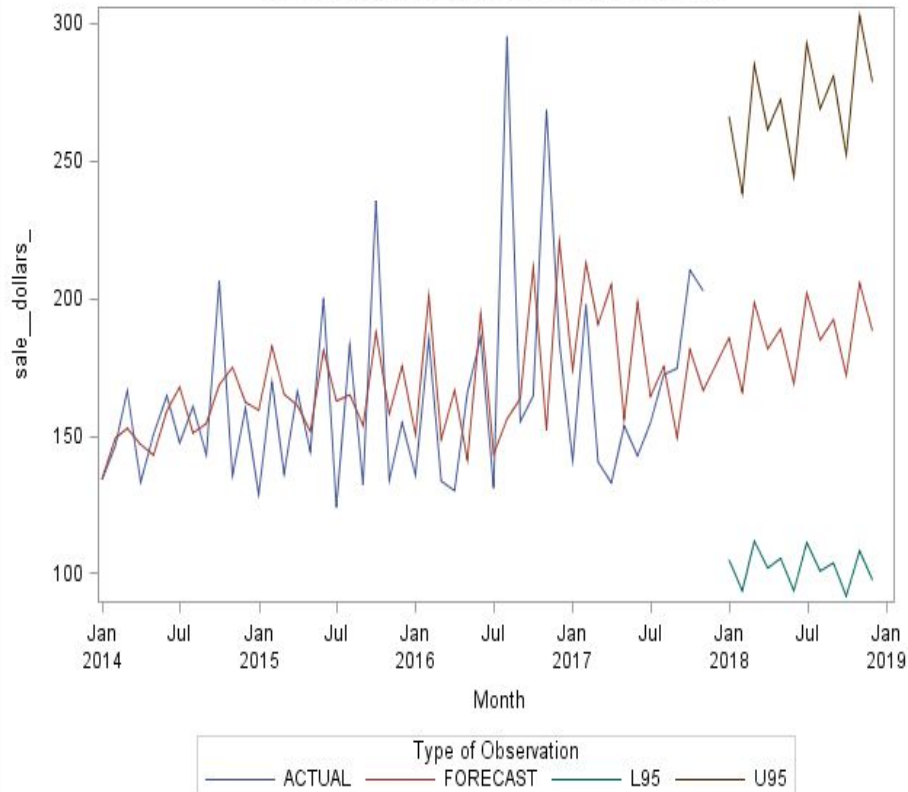| Parameter Estimates | | | | | |
|---|---|---|---|---|---|
| Variable | DF | Estimate | Standard Error | t Value | Approx Pr > \|t\| |
| Intercept | 1 | 4.8968 | 0.000728 | 6725.48 | <.0001 |
| quantity_grey | 1 | 0.9647 | 0.000629 | 1534.57 | <.0001 |
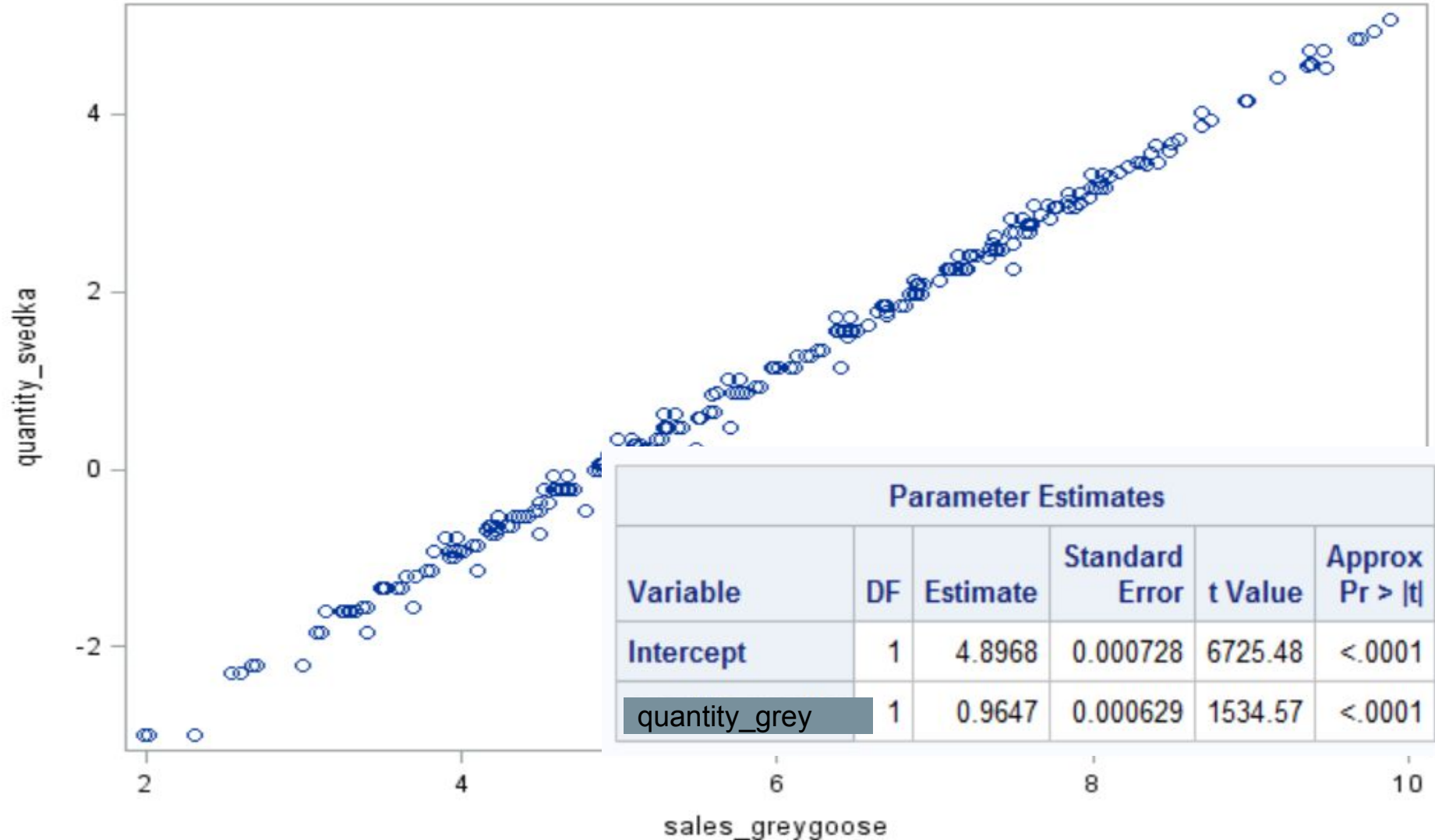
# Forecasting

- In order to help the liquor stores estimate sales of specific brands for the next 1 year, we have made use of 2 forecasting methods viz

  1. Single exponential smoothing
  2. Seasonal exponential smoothing

- On comparing the MAPE (Mean Absolute Percentage Error) values of the 2 methods, we found that Seasonal Exponential Smoothing works the best for all brands
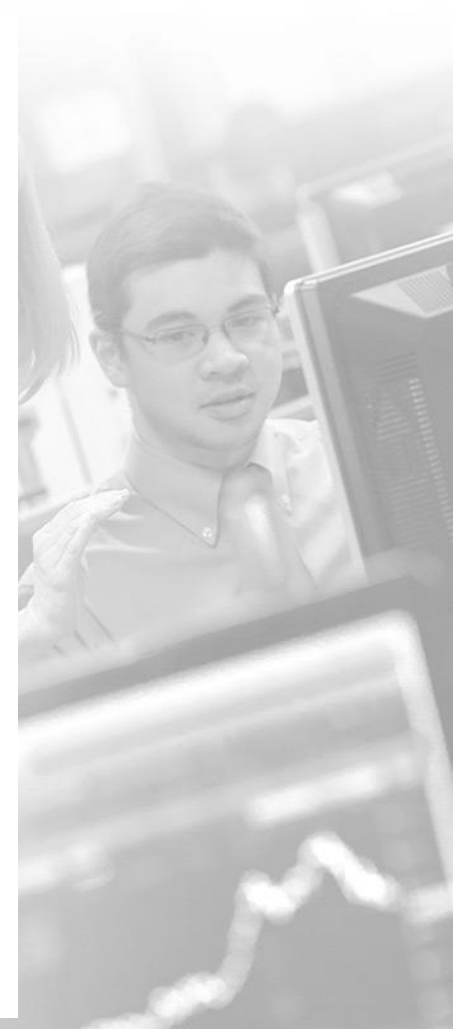
# Seasonal Exponential Smoothing for Absolut and Smirnoff
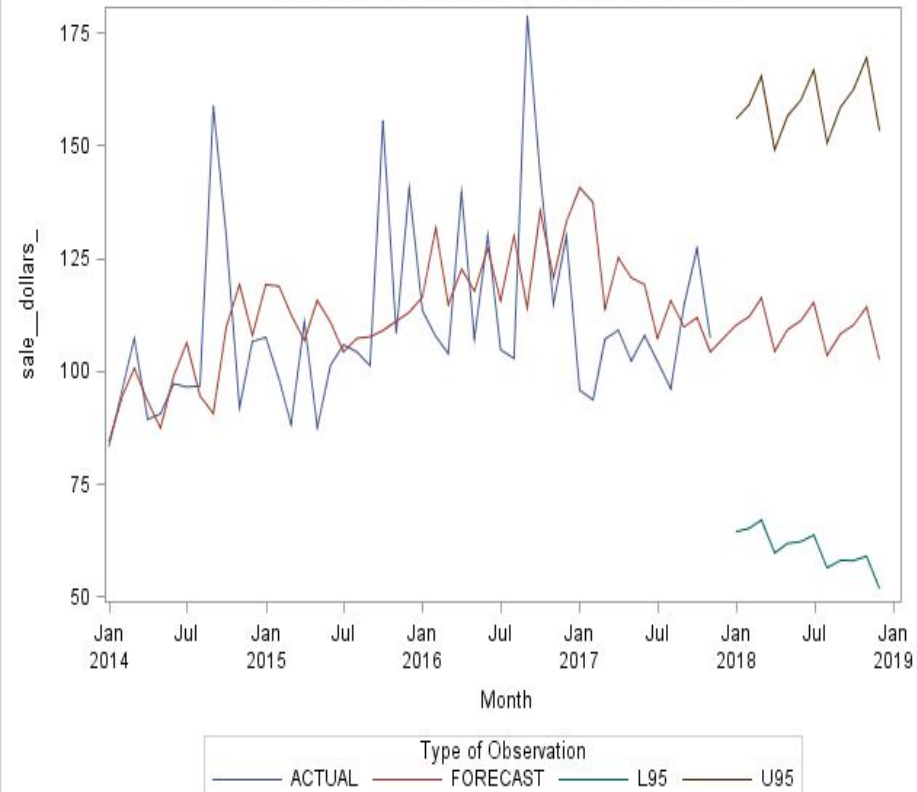
# Clustering/Segmentation

How Clustering helps to segment the market for analysis?
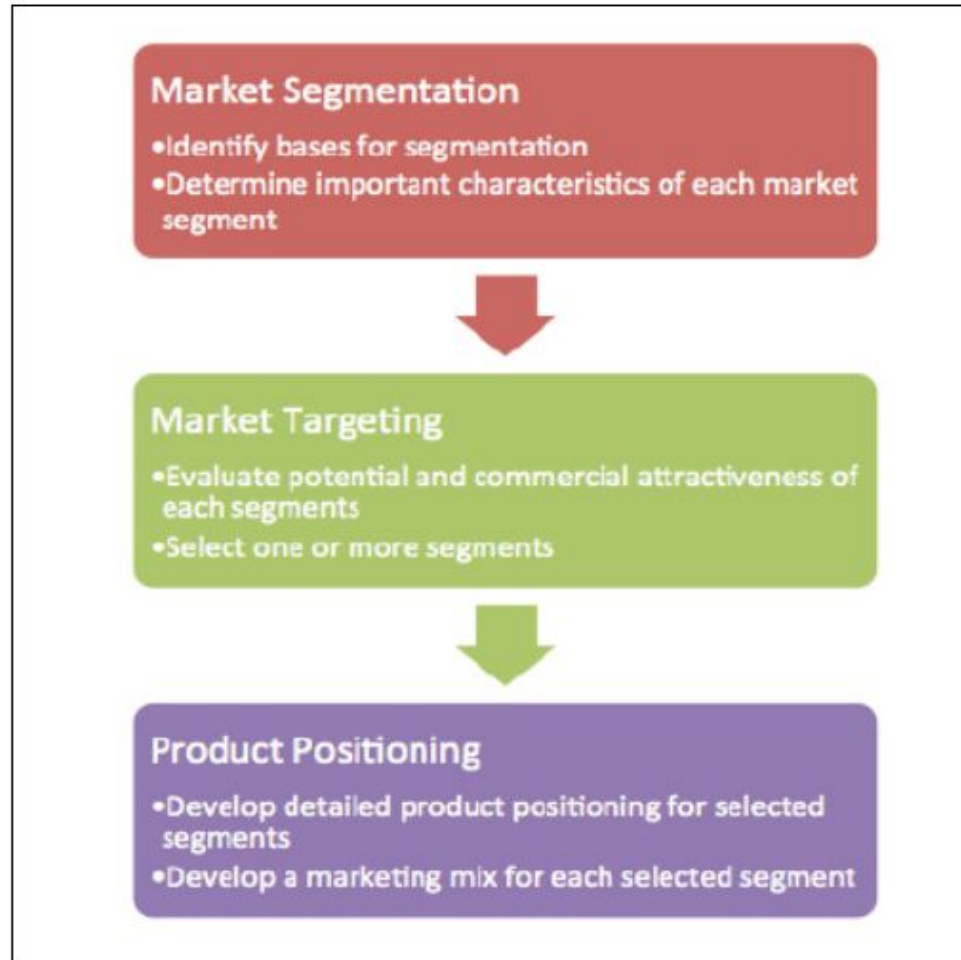
# Customer preference of vodka on the basis of demographics

| Age Group | Income | Vodka preference |
|---|---|---|
| 21-34 | 50k and above | Grey Goose/Absolute |
| 21-34 | 30 - 50k | Svedka/Smirnoff |
| 35-64 | 50k and above | Grey Goose/Absolute/Smirnoff |
| 35-64 | 30-50k | New Amsterdam/Svedka |
| 65 and above | 50-100k | FiveOClock/Absolut/Svedka |

# Market segmentation based on 5 clusters for each vodka brand
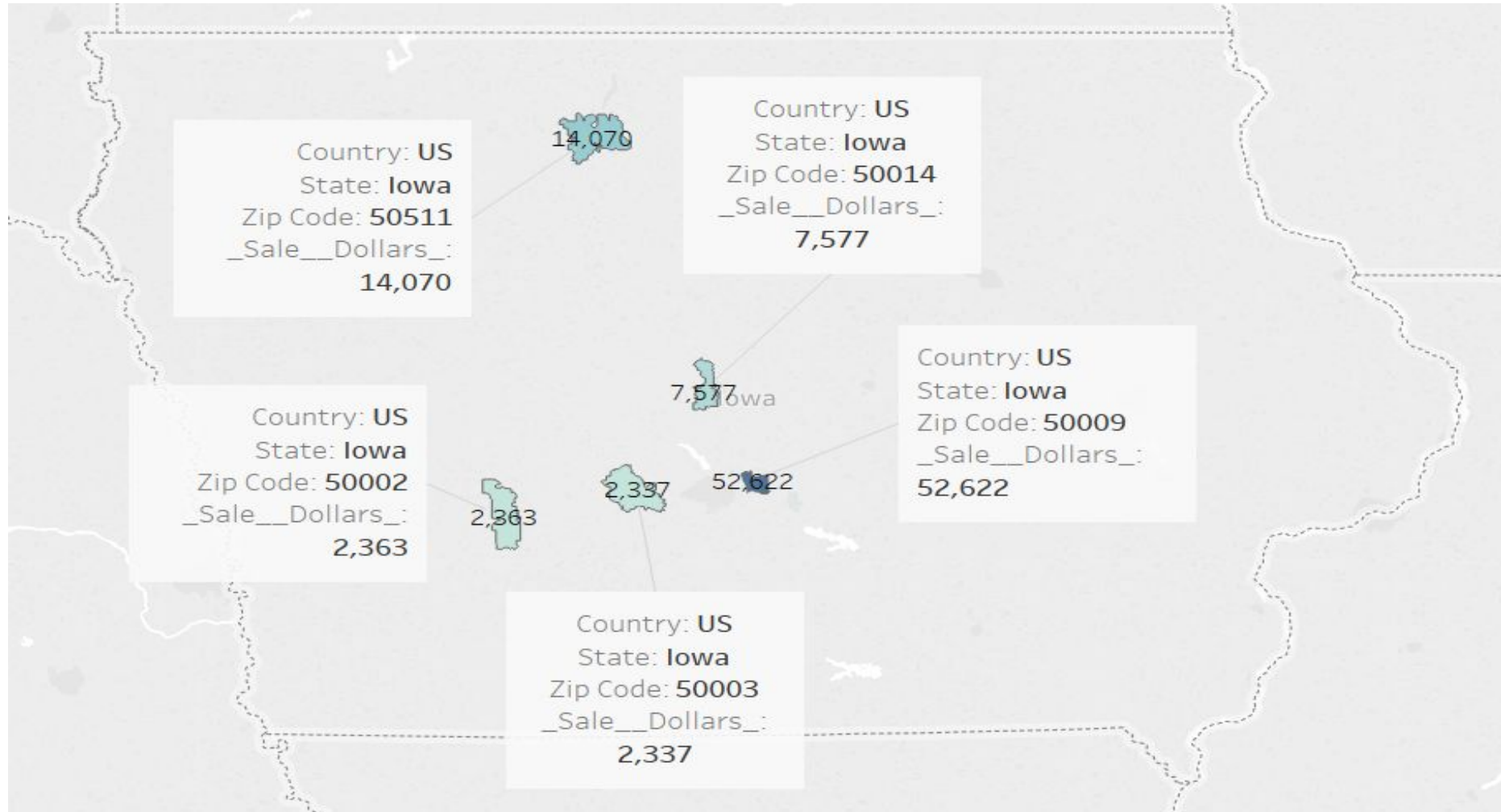
Absolut:

| | | | Cluster Summary | | | |
|---|---|---|---|---|---|---|
| Cluster | Frequency | RMS Std Deviation | Maximum Distance from Seed to Observation | Radius Exceeded | Nearest Cluster | Distance Between Cluster Centroids |
| 1 | 2909 | 9.6784 | 35.8244 | | 4 | 70.9851 |
| 2 | 1607 | 22.6174 | 37.7298 | | 4 | 65.2528 |
| 3 | 7952 | 15.1491 | 36.8764 | | 5 | 37.8276 |
| 4 | 8183 | 12.0608 | 28.0624 | | 2 | 65.2528 |
| 5 | 11549 | 9.3649 | 18.8528 | | 3 | 37.8276 |

Smirnoff:

| | | | Cluster Summary | | | |
|---|---|---|---|---|---|---|
| Cluster | Frequency | RMS Std Deviation | Maximum Distance from Seed to Observation | Radius Exceeded | Nearest Cluster | Distance Between Cluster Centroids |
| 1 | 11467 | 14.0926 | 45.7646 | | 5 | 30.3105 |
| 2 | 153 | 3.2884 | 16.0349 | | 4 | 84.6326 |
| 3 | 17656 | 8.3042 | 45.7771 | | 4 | 26.1417 |
| 4 | 4646 | 8.7407 | 34.6669 | | 3 | 26.1417 |
| 5 | 17410 | 8.1493 | 17.1834 | | 1 | 30.3105 |

# Demographics showing areas with maximum sales for Absolut



Country: US
State: Iowa
Zip Code: 50511
_Sale__Dollars_:
14,070

Country: US
State: Iowa
Zip Code: 50014
_Sale__Dollars_:
7,577

Country: US
State: Iowa
Zip Code: 50002
_Sale__Dollars_:
2,363

Country: US
State: Iowa
Zip Code: 50009
_Sale__Dollars_:
52,622

Country: US
State: Iowa
Zip Code: 50003
_Sale__Dollars_:
2,337

# Marketing Strategy

Our main strategy for marketing is based on factors like :
- Age Group
- Income
- Zip Code

Our plan is to target a certain age group in a specific **zip code** to increase the vodka sales for a new or existing vodka retail store that wants to :
- Decide on the inventory of vodka that the stores should keep in order to serve maximum customers
- Keep holding costs in check while maintaining sufficient stock

Example: For the zip code 50002 in the state of Iowa,
Age group 21-34 prefer brands like Absolut and Greygoose with income above 50k compared to income below 50k as they prefer Svedka and Absolut

# References:

1. Kaggle
2. Claritas

# THANK YOU!!



KEEP
CALM
AND
DRINK
VODKA