

Customer segmentation department store

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Problem/Opportunity



Can we identify customer clusters of a department store that have similar profiles and what characteristics do these customer clusters have?

01

To adjust marketing campaigns, product promotions, and individualized selling strategies

02

Customers expect brands to provide personalization

03

The traditional segmentation process can be imprecise, one-dimensional, and not enough

Goals of this project



Create an effective, based on machine learning segmentation



The customer data will be used to segment and create clusters of customers with



The store can use this segmentation to strategize its marketing or product creation. that will lead to a profit increase.



METHOD

- **Unsupervised machine learning in form of clustering algorithms.**
- **The best model applied to the segmentation of current data but also can be used on future data of the store**
- **Results in form of each group description.**



Data source

Dataset: Customer Personality Analysis is a publicly available dataset on Kaggle.

2240 entries

29 features

Acknowledgment: The dataset was provided by Dr. Omar Romero-Hernandez. <https://www.kaggle.com/datasets/imakash3011/customer-personality-analysis?resource=download>



Machine learning features

Number of deals purchased

Response to a recent promo

Number of responses to previous promotions

Total spent on products

Total number of purchases in all locations
(instore, catalog, and online)

Exploratory Data Analysis

Findings about the
customer population

**Higher income
connected to
spending more**

**Purchase less,
less responding to
deals**

**Web visits are not
correlated with
web purchases**

Exploratory Data Analysis

Many questions are left about coherent groups

Loyal customers spend slightly more

People that don't have kids make more web purchases

People with kids respond less to promotions but more to deals

Selecting Best Model

KMeans

5 CLUSTERS

Silhouette score=0.459

Birch

2 CLUSTERS

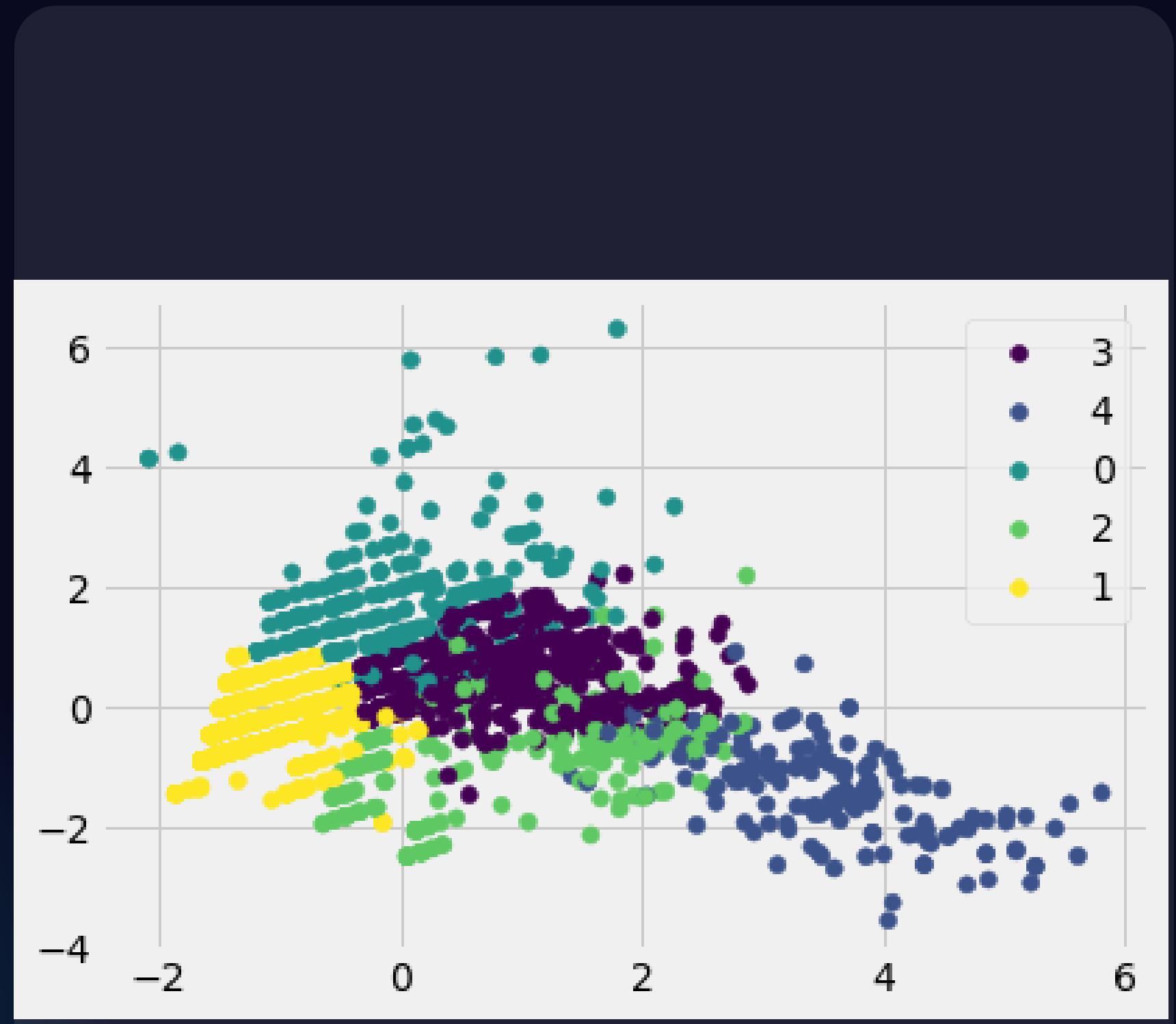
Silhouette score=0.482

Cluster_0= 2116 entrees

Cluster_1= 121 entrees

Selected Model

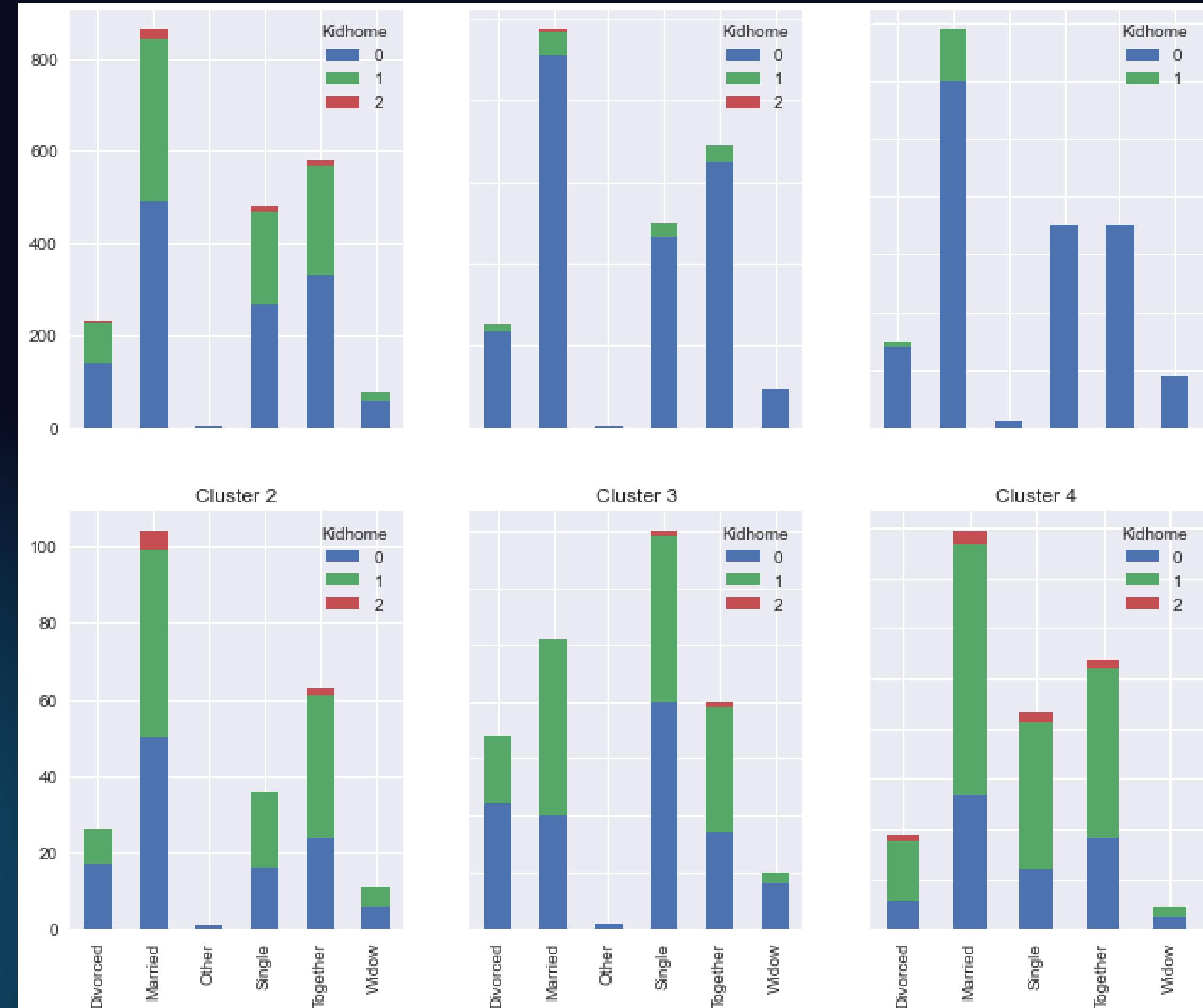
Kmeans with 5 clusters.



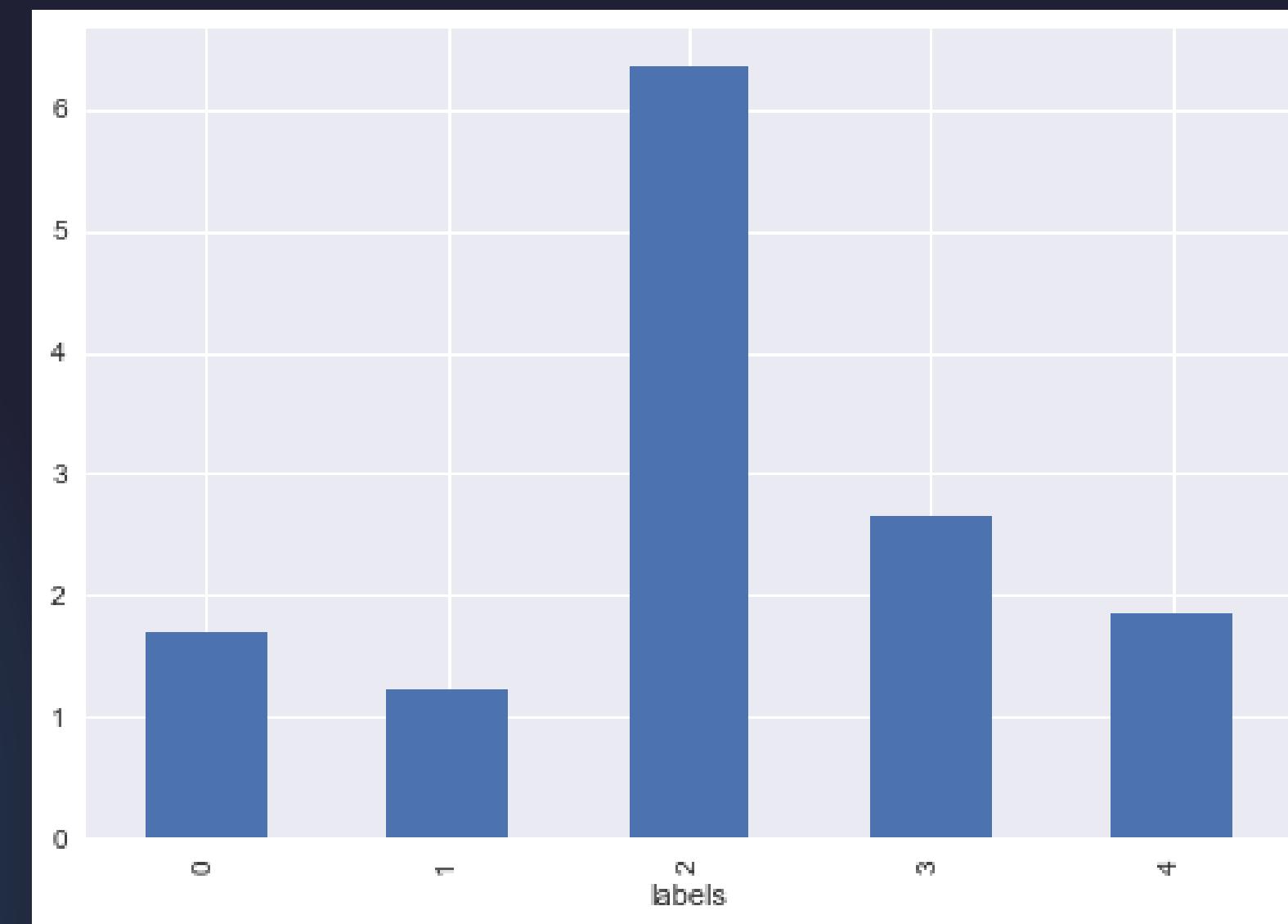
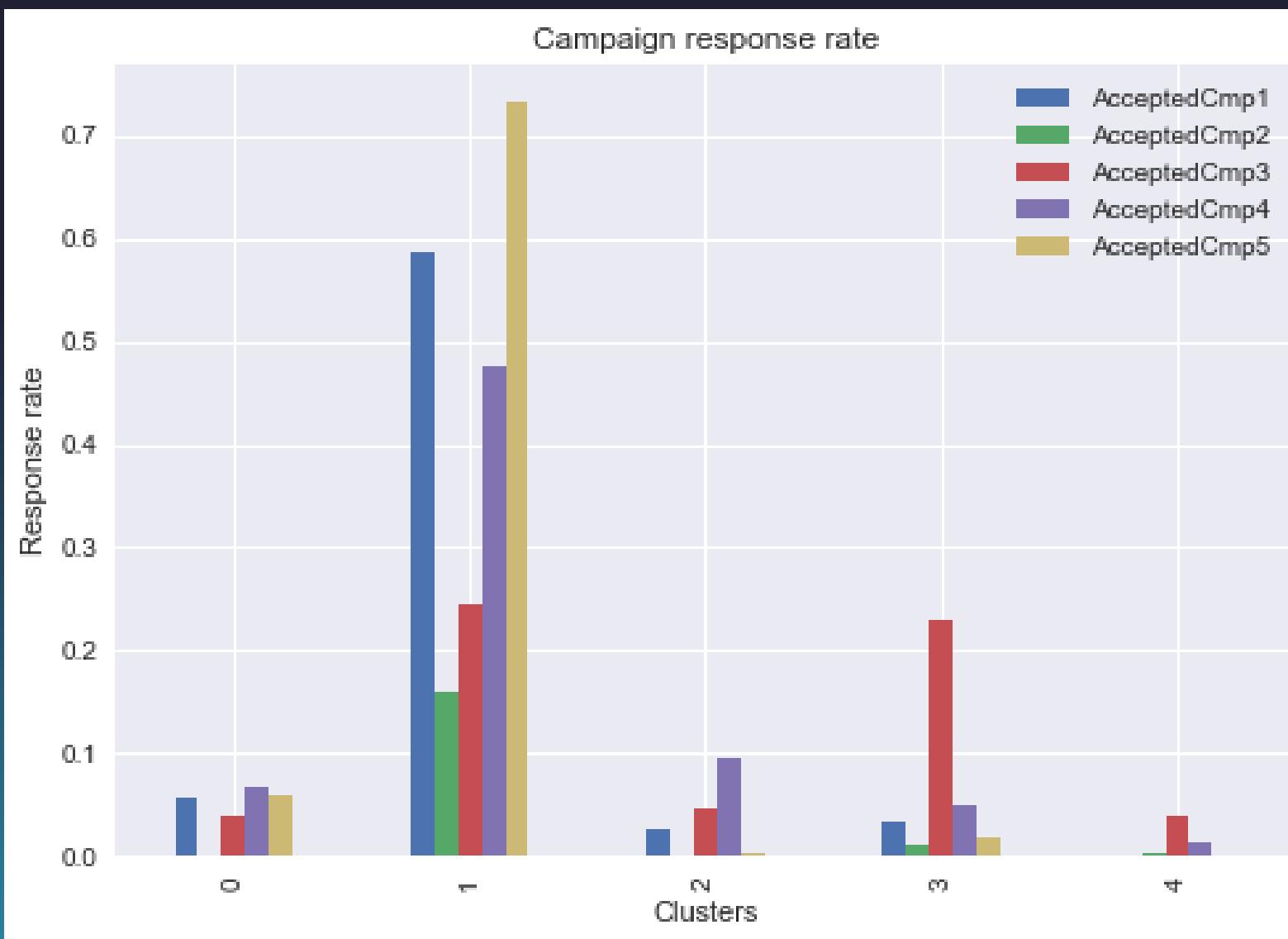
Clusters demographics

marital status and having small kids in each cluster

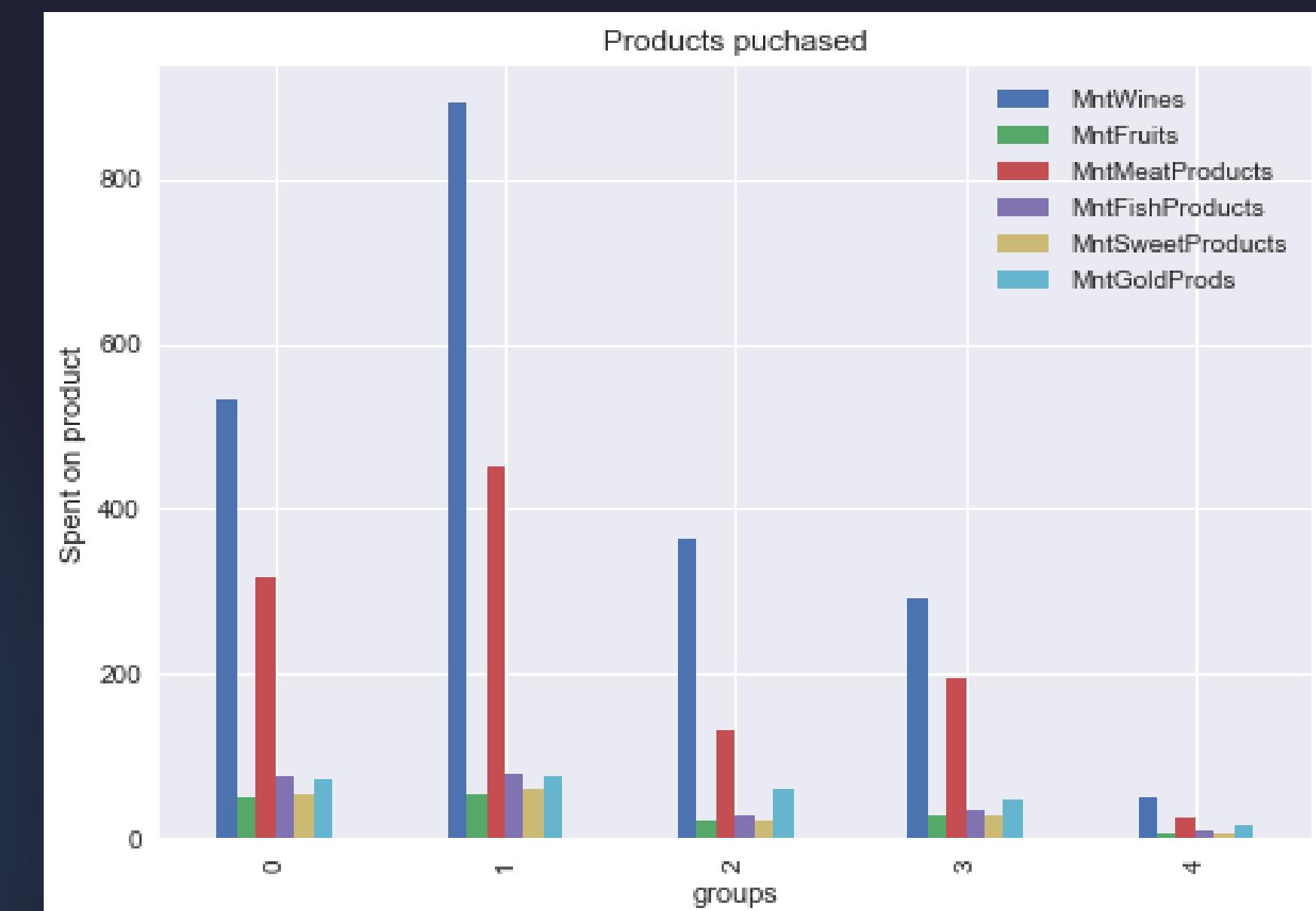
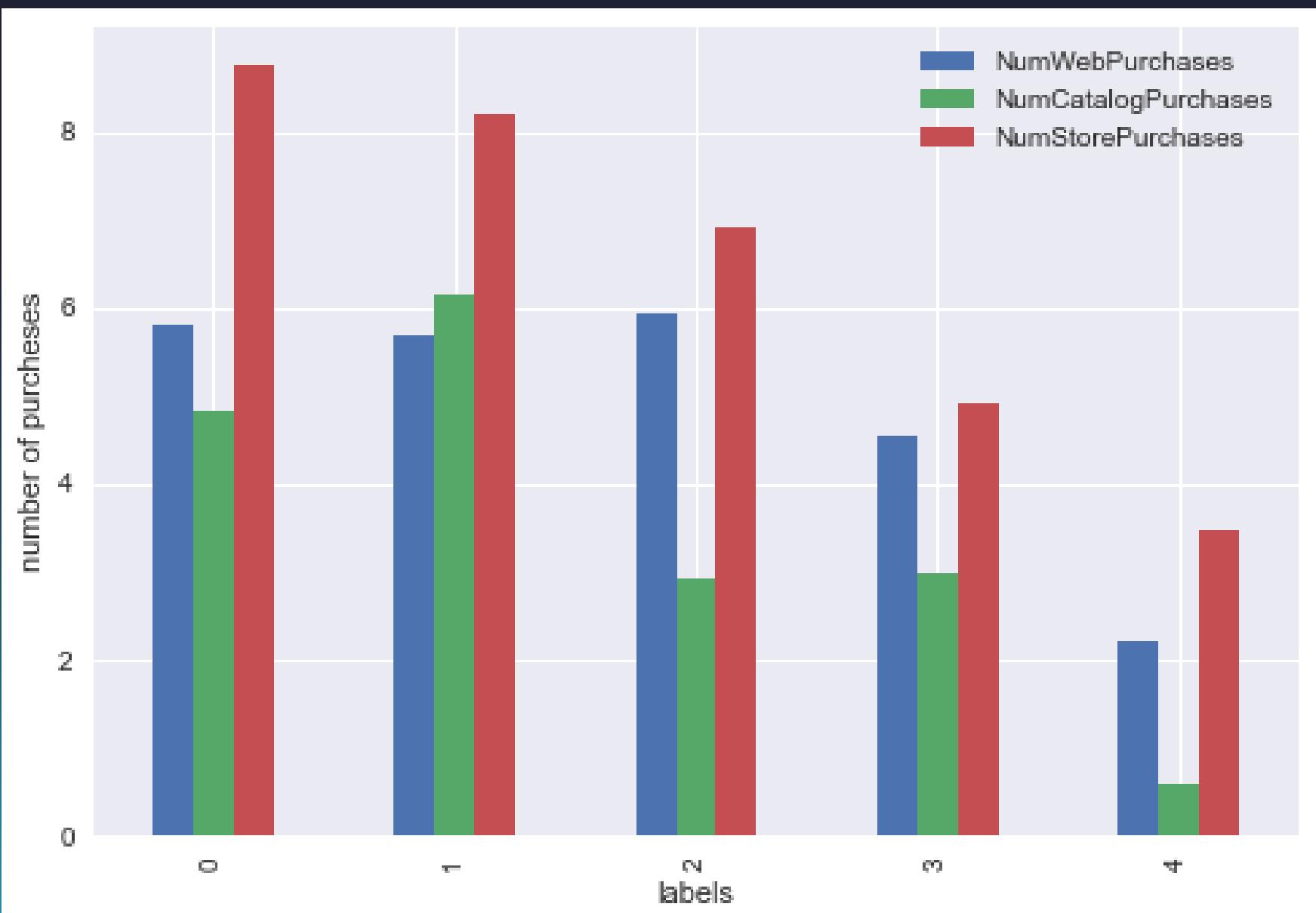
Marital status and having small kids in each cluster



Campaigns' response rate and deal purchases



Location and Products



Top Customer cluster

Cluster size	164 customers
Income	Highest income
Spending	Highest purchases and spending on products
Marital status:	Married or with a partner
Level of education:	50 % graduate level and 42 % higher education.
Children:	Mostly don't have kids. 20% have one teen at home.
Promotions:	Respond to most promotions.
Deals:	Relatively low response rate to deals
Best promotion:	Promo no 5
Location	Buy in-store mostly, next preferred is <u>catalog</u> . Don't visit the website as much.
Products:	Spend on wine, meat, and fish, less on gold.

Customer cluster 0

Cluster size	628 customers
Income	<u>Second highest income</u>
Spending	Second highest purchases and total spending
Marital status:	Married or with a partner
Age:	Have fewer young people
Level of education:	54% graduate level and 36 % higher education.
Children:	50& don't have kids. The rest have mostly one teen
Promotions:	<u>Don't respond to most promotions.</u>
Deals:	Respond to deals, but less than others
Location	Buy in-store mostly, next preferred is online. Don't visit the website as much.
Products:	Spend on wine, meat, and fish, less on gold.

Customer cluster 2

Cluster size	241 customers
Income	Third <u>highest income</u>
Spending	Third highest purchases and total spending
Marital status:	Married or with a partner
Age:	Have fewer young people
Level of education:	40 % graduate level and 50 % higher education.
Children:	60% have one teen, some have one teen and 1 younger child.
Promotions:	<u>Don't respond to most promotions.</u>
Deals:	<u>Best response to deals</u>
Best promotion:	Promo no 4.
Location	Buy in-store mostly, next preferred is online. <u>Visit the website frequently.</u>
Products:	Spend on wine, meat, and gold.

Customer cluster 3

Cluster size

Income

Spending

Marital status:

Level of education:

Children:

Promotions:

Deals:

Best promotion:

Location

Products:

206 customers

Lower income

Forth highest purchases and total spending

Single mostly, also a higher rate of divorce

44 % graduate level and 48 % higher education.

60% have at least one child

33% have two children.

Don't respond to most promotions.

Respond to deals

Promo no 3

Buy in-store mostly, next preferred is online.

Visit the website frequently

Spend on wine, meat, and gold.

Biggest cluster 4

Cluster size

Income

Spending

Marital status:

Level of education:

Children:

Promotions:

Deals:

Best promotion:

Location

Products:

998 customers

Lowest income

Lowest highest purchases and total spending

Married or with a partner

49 % graduate level and 34 % higher education.

Mostly have kids or teens

Don't respond to most promotions.

Respond to deals

Promo no 3 but still low rate.

Buy in-store mostly, next preferred is online.

Visit the website frequently

Spend on wine, meat, and gold.

Recommendations

Top customers: specific attention, promoting favorite products, catalog as much as in-store!

Second in buying ability and didn't respond to promotions. Should be targeted better, in-store and online.

Group 4 is buying less, but it's the biggest group: small investment of time finding their preferences. Targeting with deals.

Recommendations

Groups 2,3 and 4 visit the website more but still prefer buying in-store: Preferences and demographics and call for action.

**Invest in promotion or deal worked for each group.
For example, promo 4 worked for group 2. Also,
teen related promotions should be tried.**

Future directions

More information needs to be collected: gender, store, and website traffic

Time-related metrics: what time buying in-store online, seasonal buying, by groups,

Preferred brands, More specific shopping cart descriptions for each group

Preferences by surveys and A/B testing on website or in-store

Thank You