Customer Personality Analysis

Yuechen Liu

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BIS 634

Supervisor: Robert McDougal

Background/Motivation

https://www.ispo.com/en/markets/id_77482972/the-new-relationship-between-consumer-and-company.html
https://degreesandcareers.info/business/consumer-psychology/

Data Description

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Data columns (total 29 columns):
 #   Column               Non-Null Count  Dtype
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 0   ID                   2240 non-null   int64
 1   Year_Birth           2240 non-null   int64
 2   Education            2240 non-null   object
 3   Marital_Status       2240 non-null   object
 4   Income               2216 non-null   float64
 5   Kidhome              2240 non-null   int64
 6   Teenhome             2240 non-null   int64
 7   Dt_Customer          2240 non-null   object
 8   Recency              2240 non-null   int64
 9   MntWines             2240 non-null   int64
 10  MntFruits            2240 non-null   int64
 11  MntMeatProducts      2240 non-null   int64
 12  MntFishProducts      2240 non-null   int64
 13  MntSweetProducts     2240 non-null   int64
 14  MntGoldProds         2240 non-null   int64
 15  NumDealsPurchases    2240 non-null   int64
 16  NumWebPurchases      2240 non-null   int64
 17  NumCatalogPurchases  2240 non-null   int64
 18  NumStorePurchases    2240 non-null   int64
 19  NumWebVisitsMonth    2240 non-null   int64
 20  AcceptedCmp3         2240 non-null   int64
 21  AcceptedCmp4         2240 non-null   int64
 22  AcceptedCmp5         2240 non-null   int64
 23  AcceptedCmp1         2240 non-null   int64
 24  AcceptedCmp2         2240 non-null   int64
 25  Complain             2240 non-null   int64
 26  Z_CostContact        2240 non-null   int64
 27  Z_Revenue            2240 non-null   int64
 28  Response             2240 non-null   int64
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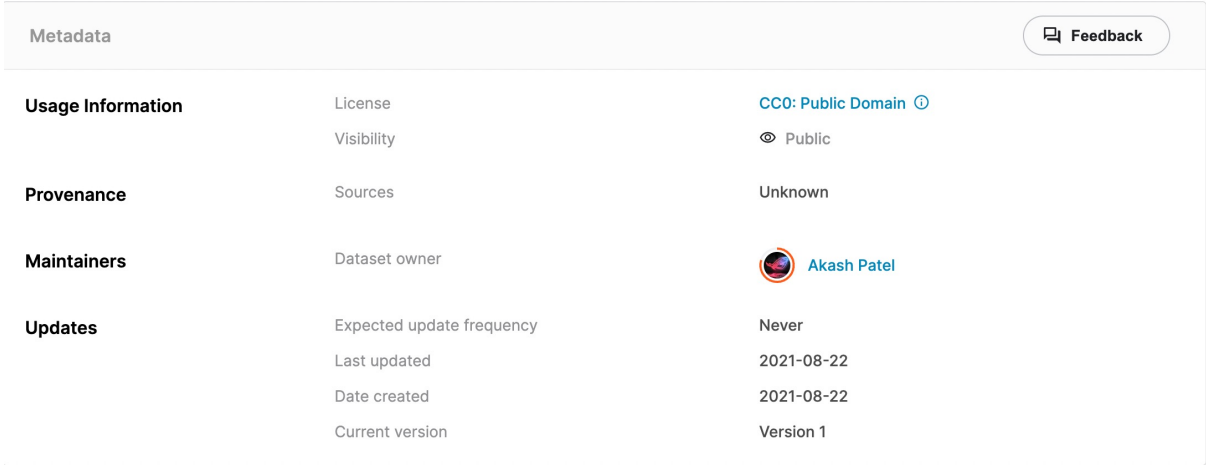
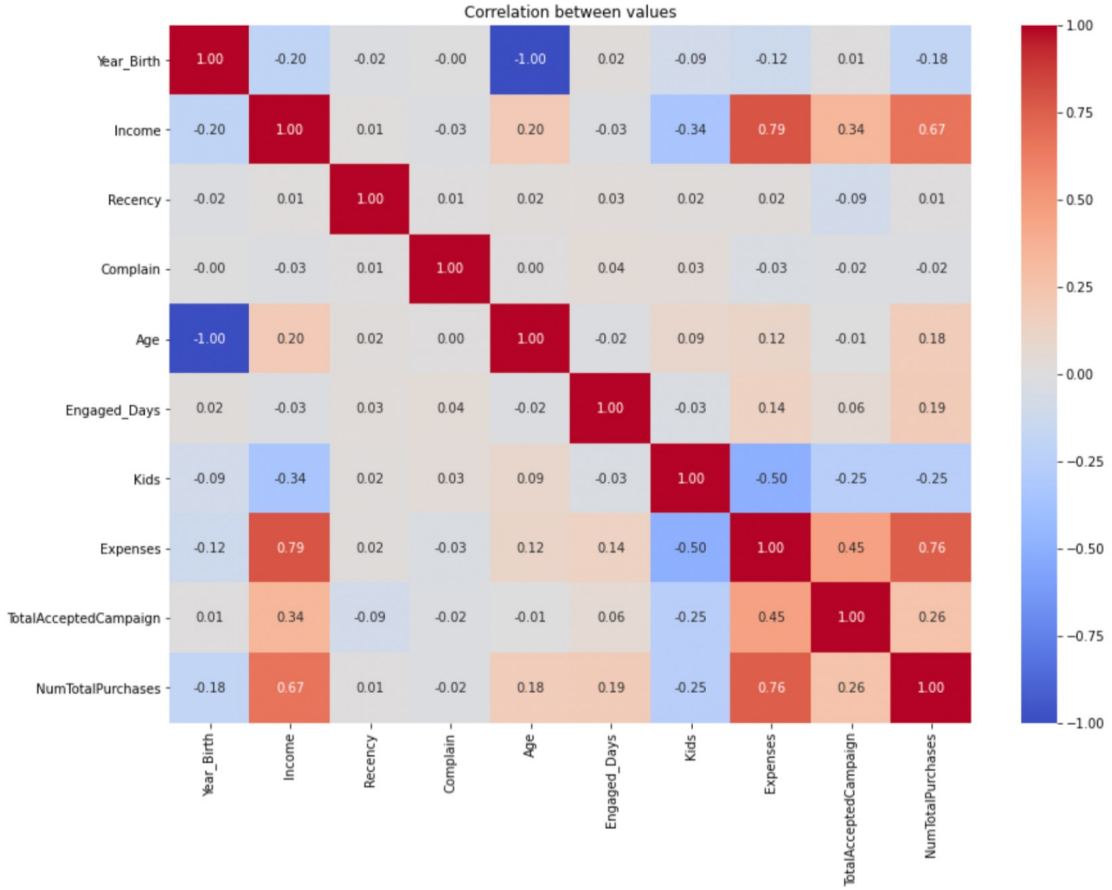


Data Organizing

- Drop missing data& unuseful columns
- Check outliers
- Reduce the dimensions

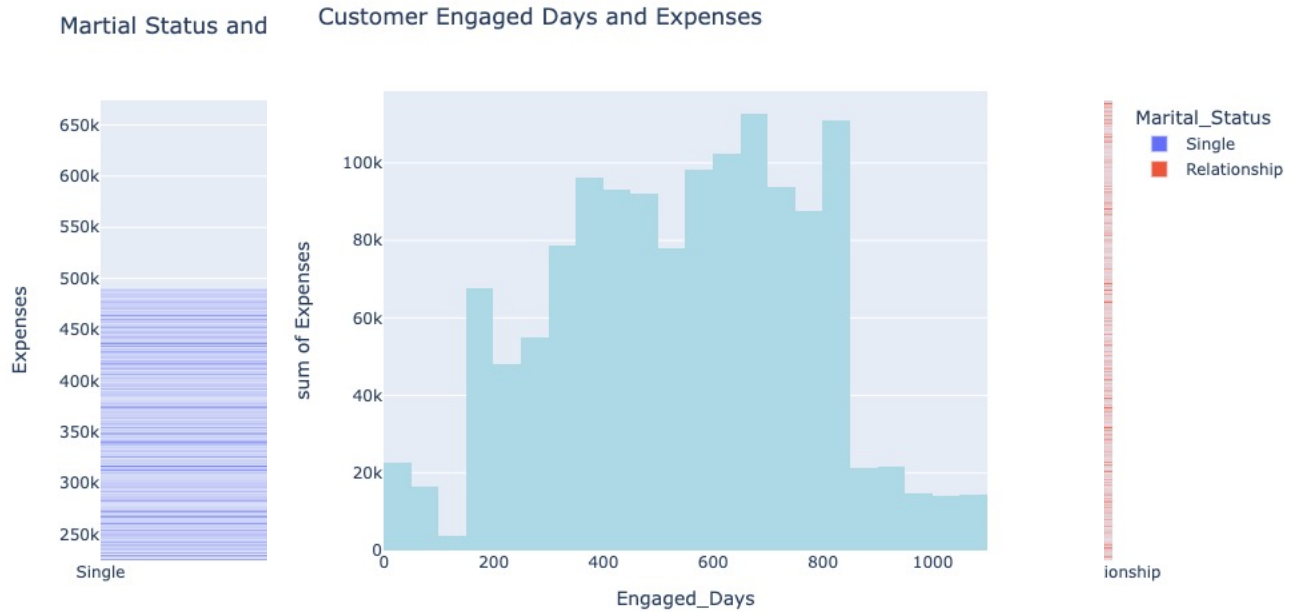
New Columns	Replaced Variables	New Variables
Education	"Graduation", "PhD", "Master", "2n Cycle"	“Graduate”
Education	"Basic"	"Undergraduate"
Marital_Status	'Married', 'Together'	'Relationship'
Marital_Status	'Divorced', 'Widow', 'Alone', 'YOLO', 'Absurd'	'Single'
Kids	'Kidhome' + “Teenhome'	
Expenses	'MntWines' + 'MntFruits'+ 'MntMeatProducts' + 'MntFishProducts' + 'MntSweetProducts' +'MntGoldProds'	
TotalAcceptedCampaign	'AcceptedCmp1' + 'AcceptedCmp2' + 'AcceptedCmp3' + 'AcceptedCmp4' + 'AcceptedCmp5'+'Response'	
NumTotalPurchases	'NumWebPurchases'+ 'NumCatalogPurchases'+	
	'NumStorePurchases' + 'NumDealsPurchases'	

Data Visualization

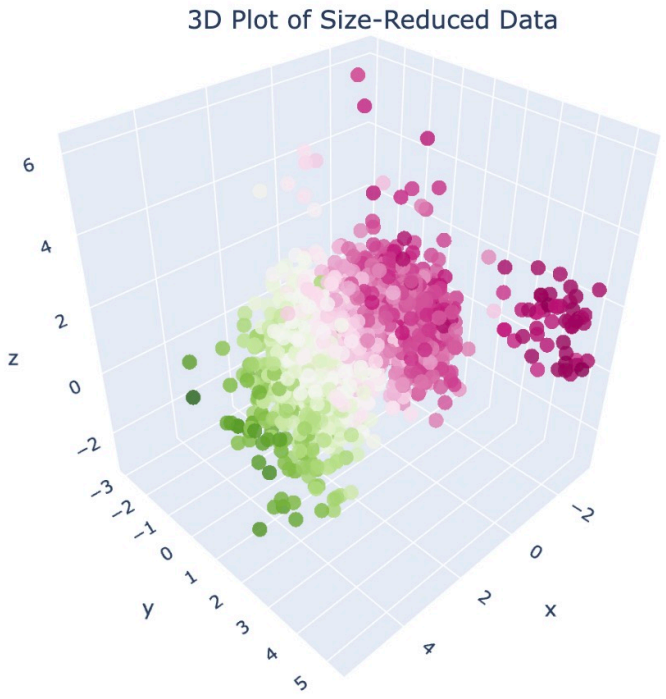


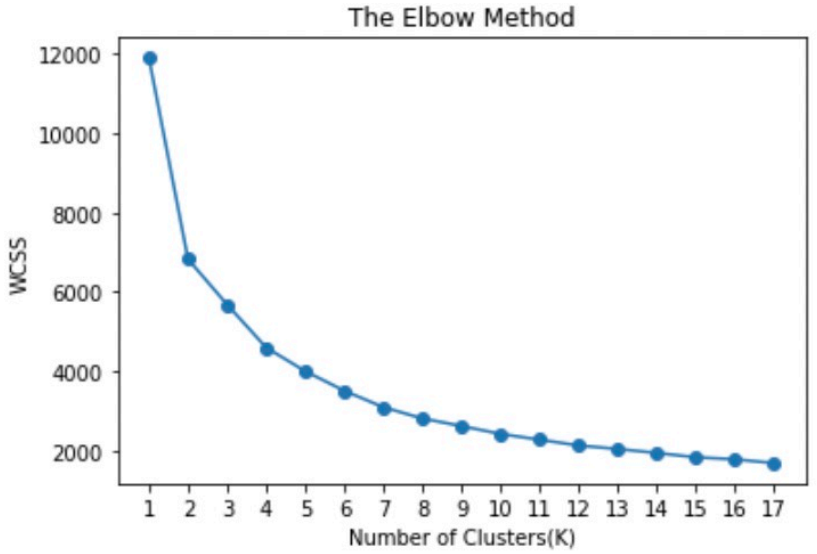
- Strong correlation: income and expenses
- Moderate correlation: kids' number and expenses

Data Visualization

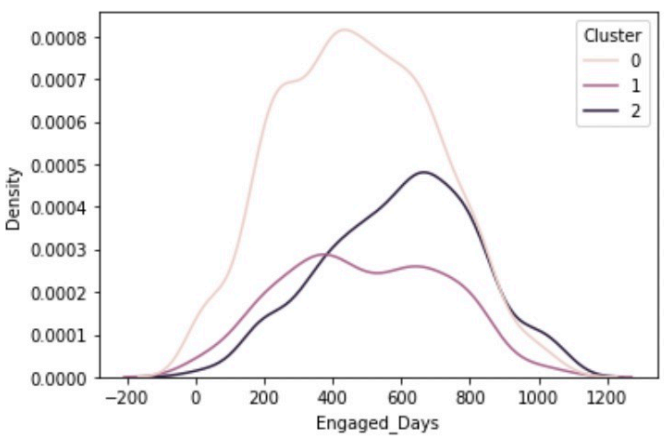


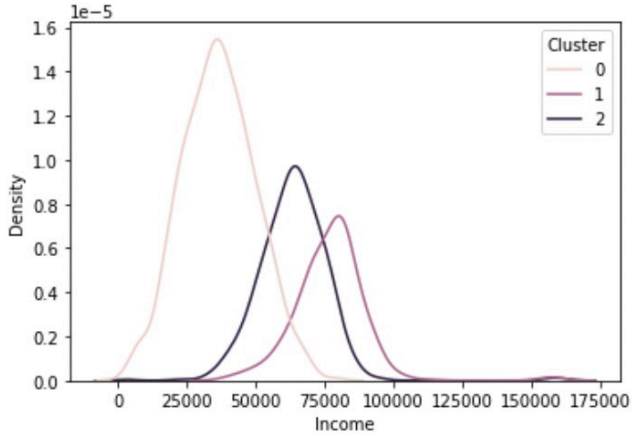
Analysis --PCA & Elbow Method

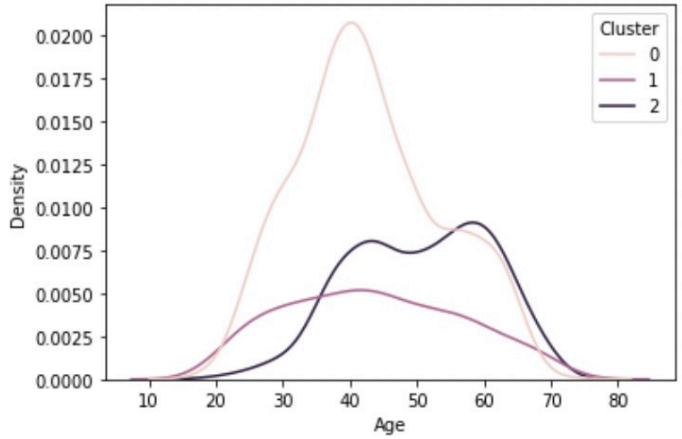


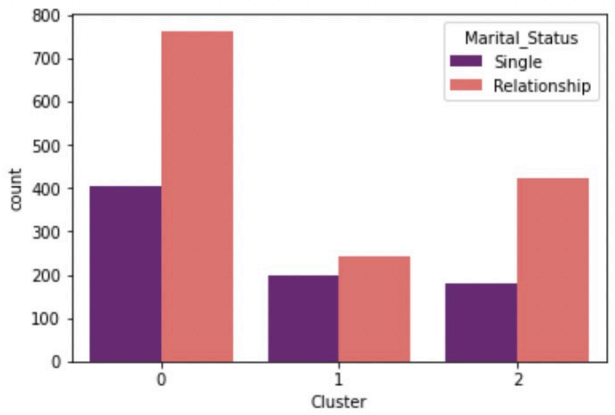


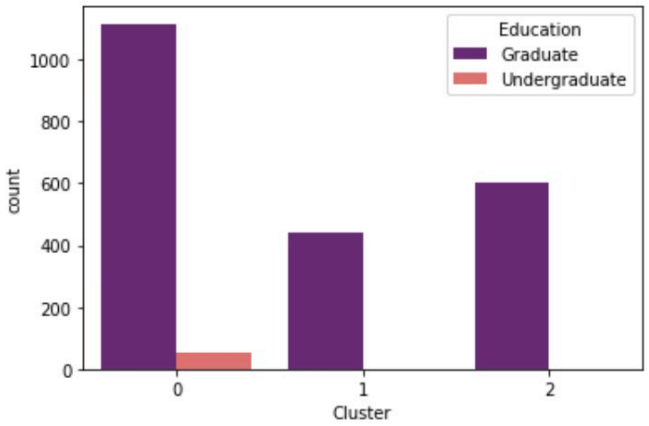
Analysis--K-Means Clustering

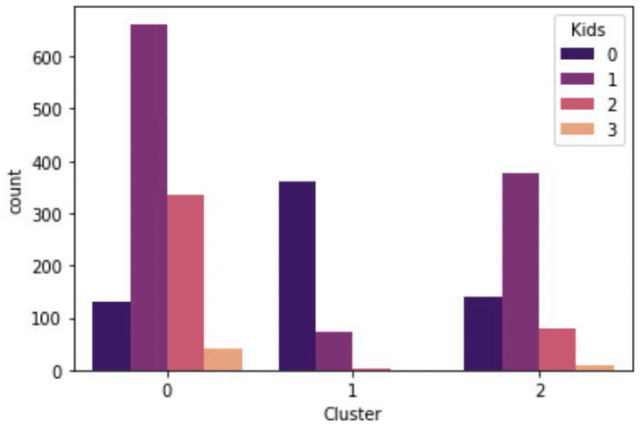












Cluster 1: Highest income: Highest expenses—> “Gold Customer”

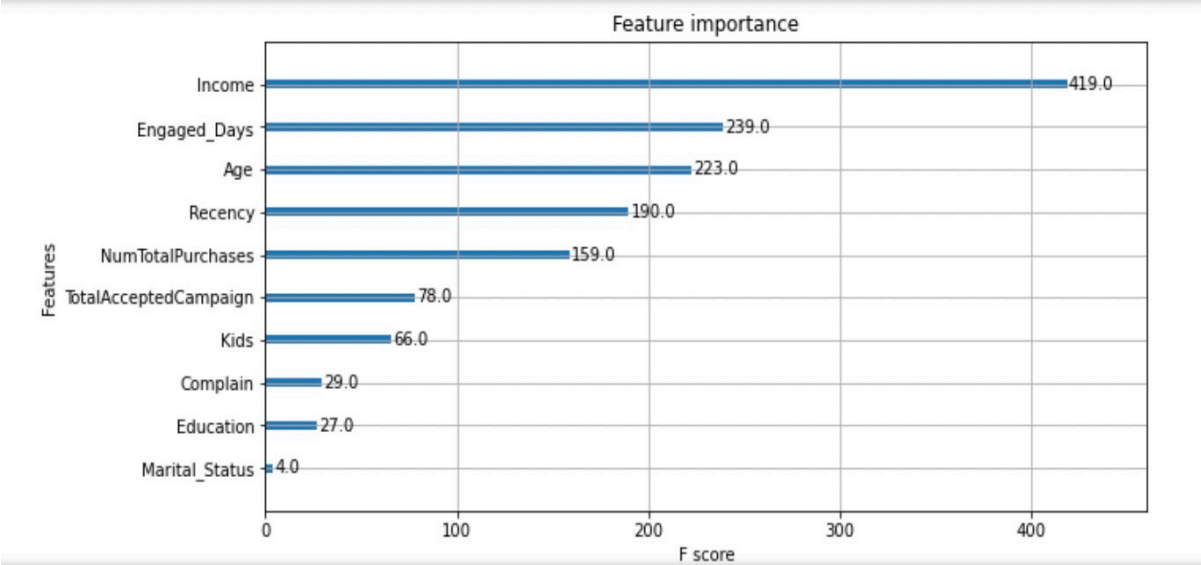
- Education: graduates.
- Marital Status: approximately half of them are in a relationship; half of them are not.
- Kids: most of them do not have kids.
- Age: most of them are around 40 years old.
- Engaged Days: most of them have enrolled in the company for around 400 days and 700 days.

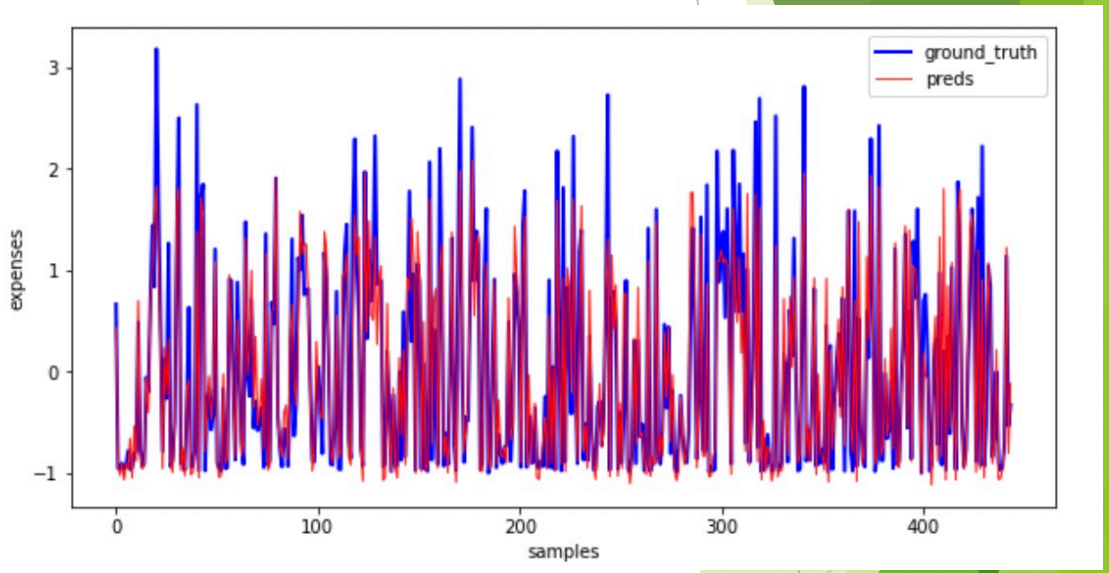
Cluster 0: Lowest to moderate income: Lowest expenses—> “Bronze Customer”

- Education: the proportion of undergraduates is higher than other clusters.
- Marital Status: more are in a relationship.
- Kids: most of them have more than 1 kid.
- Age: most of them are around 40 years old.
- Engaged Days: most of them have enrolled in the company for around 400 days.

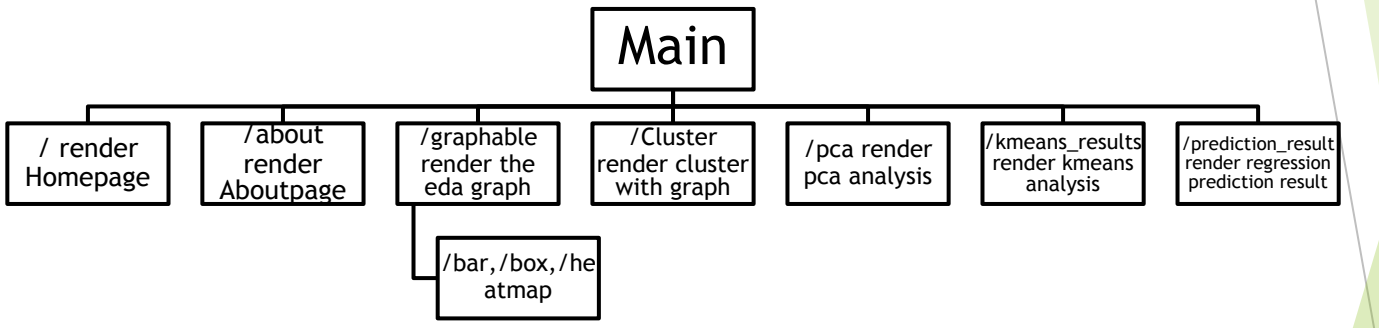
- **Cluster 2: Moderate income: Moderate expenses—> “Silver Customer”**
- Education: graduates.
- Marital Status: more are in a relationship.
- Kids: most of them have 1 kid.
- Age: most of them are around 40 years old and 60 years old.
- Engaged Days: most of them have enrolled in the company for around 650 days.

Analysis--Regression Model





Server API and Web Front-end



https://miro.medium.com/max/640/1*XzlRJGujfqAiOV2EIQgR_Q.png

Conclusion

- Interesting point
- Recommendation
  - Direct marketing
  - Predict consumer motivation

Thank you