

Customer Personality Analysis Project

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Introduction



01

Objective

Analyze customer data and apply clustering techniques to segment customers based on purchasing behaviors and demographics.

02

Tools Used

Python, Pandas, Matplotlib, Seaborn, PCA, KMeans Clustering.

03

Data Source

`marketing_campaign.csv` dataset. on Kaggle
2240 rows, 29 features

Dataset Overview



01

2240 rows, 29 features

Columns

```
['ID', 'Year_Birth', 'Education', 'Marital_Status', 'Income', 'Kidhome',  
 'Teenhome', 'Dt_Customer', 'Recency', 'MntWines', 'MntFruits',  
 'MntMeatProducts', 'MntFishProducts', 'MntSweetProducts',  
 'MntGoldProds', 'NumDealsPurchases', 'NumWebPurchases',  
 'NumCatalogPurchases', 'NumStorePurchases', 'NumWebVisitsMonth',  
 'AcceptedCmp3', 'AcceptedCmp4', 'AcceptedCmp5', 'AcceptedCmp1',  
 'AcceptedCmp2', 'Complain', 'Z_CostContact', 'Z_Revenue', 'Response']
```

02

Data Preprocessing & EDA

Identifying Opportunities and Threats

01

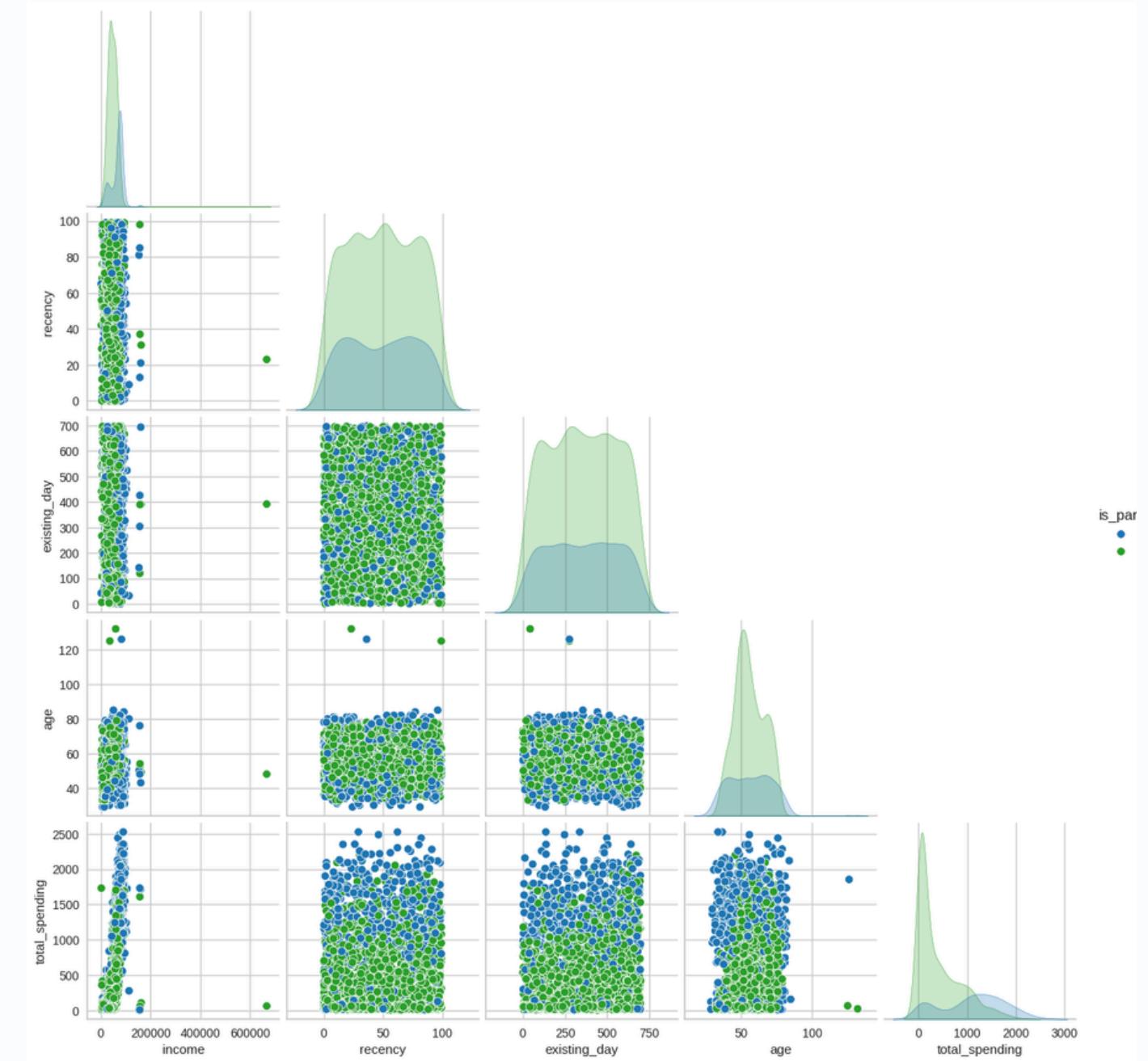
Drop rows with null values

02

Datetime Transformation

03

Exclude Outliers



Feature Engineering

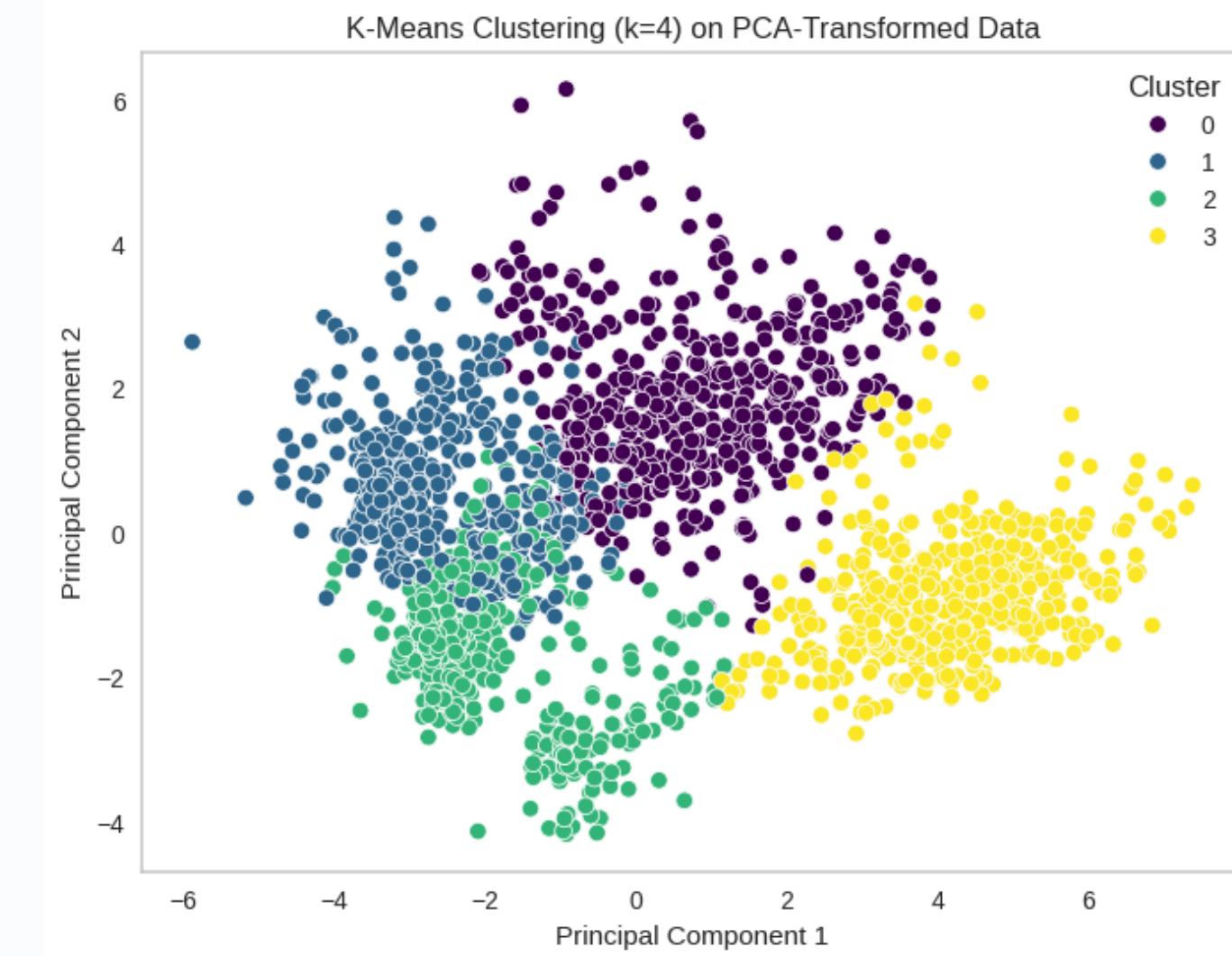
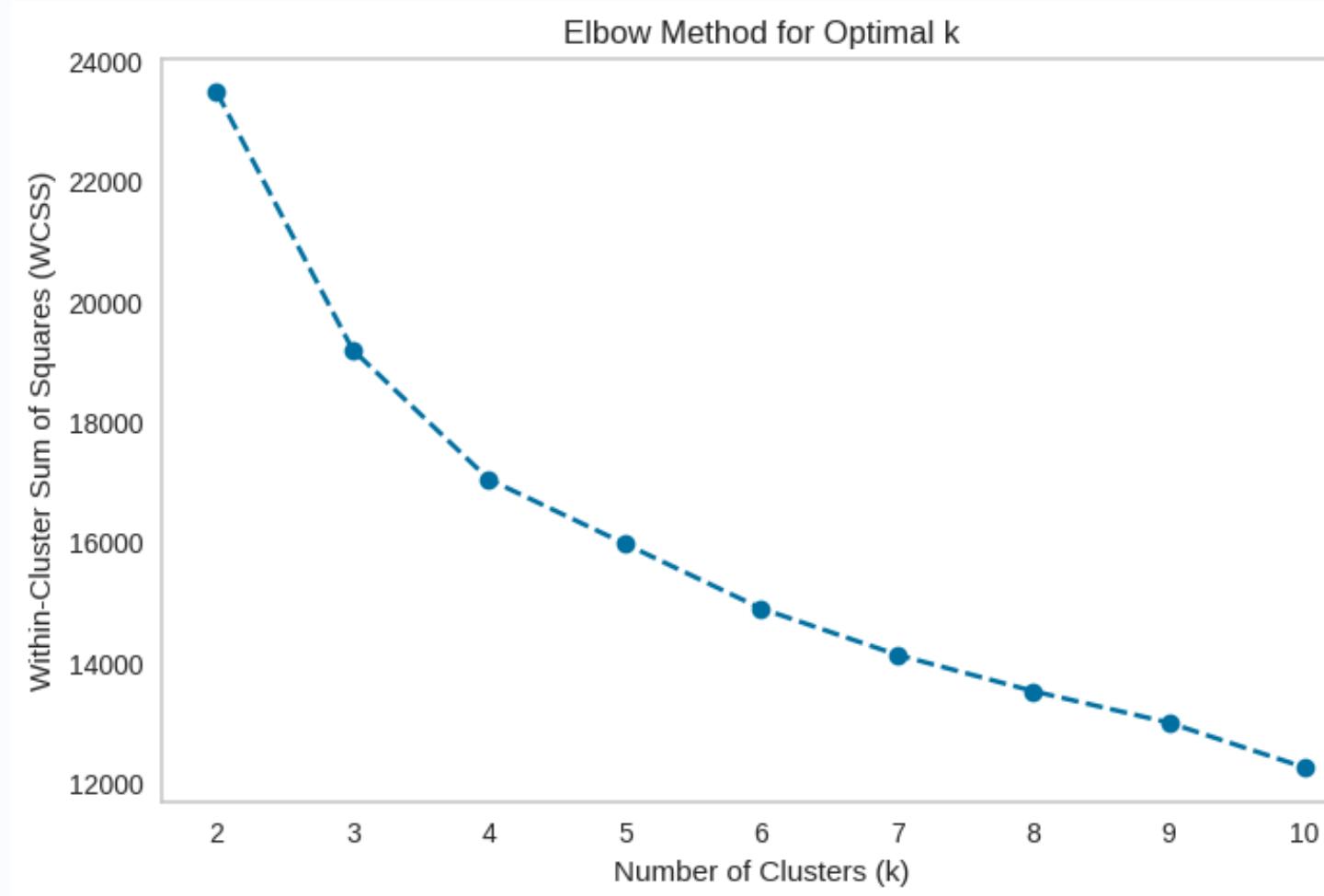


- 01 Create new features / Drop unnecessary features
- 02 Encode categorical features
- 03 Scale Features
- 04 Dimensionality Reduction (PCA)

Data Analysis

K-means Clustering

Use Elbow Method to determine optimal k = 4



Customer Segmentation & Strategies

Cluster 0

- High-income customers
- Likely to engage with discounts
- Prefer making purchases online

Cluster 1

- Low-income customers
- Likely to have larger families

Cluster 0

- Exclusive Online Deals: Offer personalized online discounts or flash sales.
- Premium Membership Offers: Provide access to premium services or products at a discounted price to engage them more deeply with the brand.
- Targeted Digital Ads: Use targeted ads for high-value products and discounts specifically on digital platforms.

Cluster 1

- Family-Oriented Discounts: Offer bundle discounts for families, such as "buy one, get one free".
- Children's Product Campaigns: Promote products for children or household essentials in bulk.
- Budget-Friendly Plans: Offer installment payment options or financial assistance programs

Customer Segmentation & Strategies

Cluster 2

- Lowest-income customers
- Not very engaged with discounts

Cluster 3

- High-income customers
- Frequent purchasers but less likely to respond to discounts

Cluster 2

- Affordable Product Lines: Introduce more budget-friendly options or create a "basic" line that offers quality at a lower price point.
- Discount Awareness: Introduce more accessible and frequent discount opportunities, even if smaller, to encourage engagement.

Cluster 3

- Exclusive Offers: Provide them with high-quality products and exclusive deals that don't necessarily rely on discounts but focus on exclusivity and premium offerings.
- Premium Service: Offer high-end services like concierge support, personal shopping assistants, or free expedited shipping.

Next Steps

Advanced
Feature
Engineering

Model
Enhancement

Deep Dive
Analysis

- Add additional features and create interaction features(e.g., Income_Frequency) to capture non-linear relationships to better predict customer behavior patterns.
- Transition to supervised learning to predict customer outcomes like churn or lifetime value using models like Random Forest or XGBoost. .
- Perform time series analysis to uncover seasonal trends. Customer churn analysis can identify segments at risk and inform retention strategies.