



Lhutfia Ichsan's

Portfolio Presentation

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USING MACHINE LEARNING



Hello, I'm Lhutfia

I am a recent Information Systems Student who has interested in Data Processing. I enjoy taking on responsibilities, contributing to a team, and finishing tasks on my own.

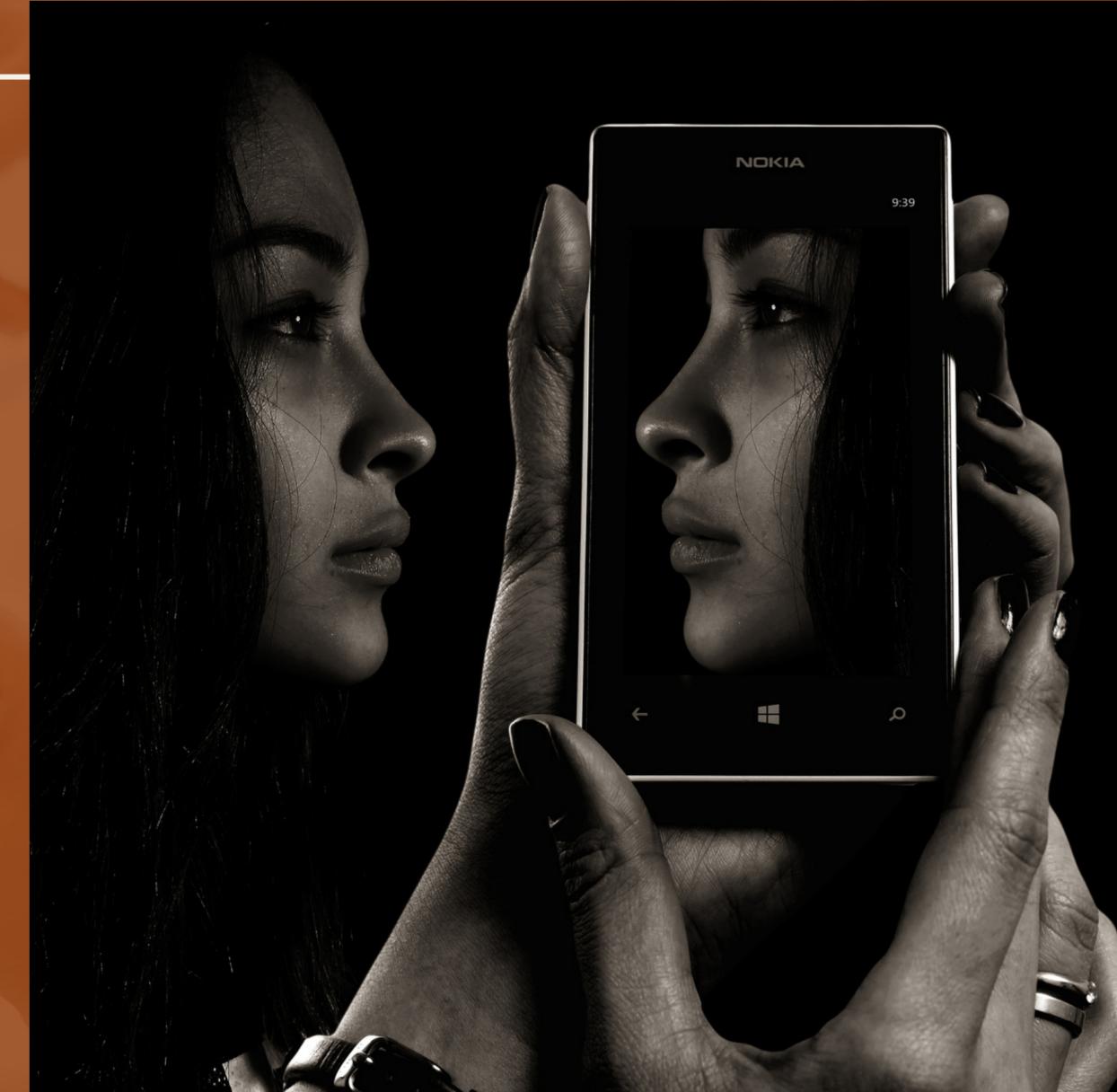
Honest and on time is my work ethic. And I'am exited for my upcoming adventure!

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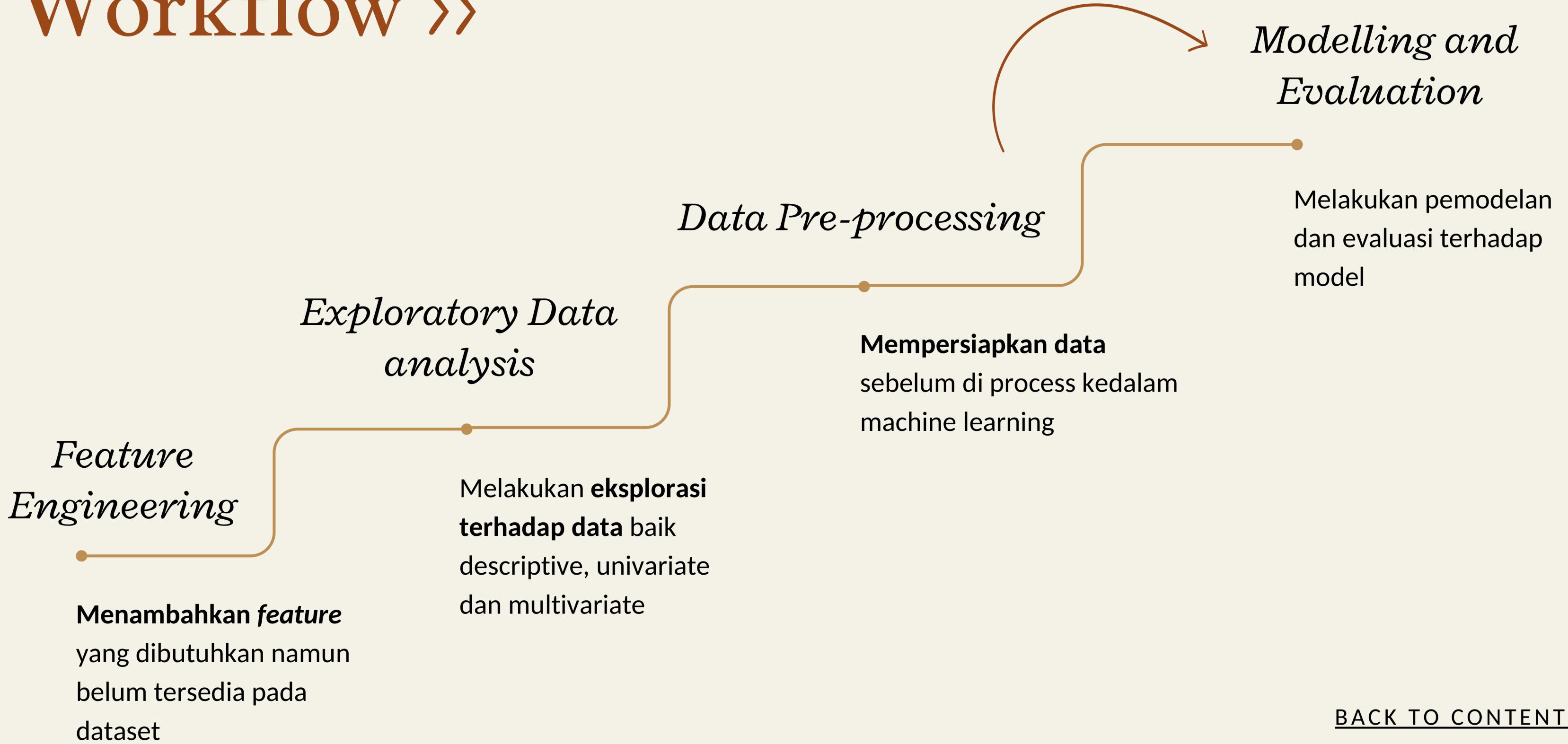
Mini Project 03

*Predict Customer
Personality to Boost
Marketing Campaign by
Using Machine Learning*



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Workflow >>



Feature Engineering

- 1 AGE
- 2 CATEGORY OF AGE
- 3 TOTAL ACCEPTED CAMPAIGN
- 4 TOTAL SPENT
- 5 TOTAL DEPENDENT
- 6 TOTAL TRANSACTION
- 7 CVR

```
# Make feature category of age
cat_age=[]
for x in df['age']:
    if x < 13 :
        cat_age.append('kids')
    elif x < 25 :
        cat_age.append('young')
    elif x < 45 :
        cat_age.append('adult')
    else :
        cat_age.append('elderly')

df['ctg_age'] = cat_age

# Make feature total accepted campaign and conversion rate (cvr)
df['totalacceptedcampaign'] = df['acceptedcmp1'] + df['acceptedcmp2'] +
                               df['acceptedcmp3'] + df['acceptedcmp4'] +
                               df['acceptedcmp5']

# Make feature total spent
df['totalspent'] = df['mntcoke'] + df['mntfruits'] +
                    df['mntmeatproducts'] + df['mntfishproducts'] +
                    df['mntsweetproducts'] + df['mntgoldprods']

#Make feature total transaction
df['totaltransaction'] = df['numdealspurchases'] + df['numwebpurchases'] +
                           df['numcatalogpurchases'] + df['numstorerepurchases']

# Make feature total dependent
df['totaldependent'] = df['kidhome'] + df['teenhome']

# Make feature cvr
def safe_div(x, y):
    #bertujuan untuk menangani /0 pada cvr jika total numwebvisitsmonthnya 0
    if y == 0 :
```

Data Pre-processing



Missing Value and Duplicate Data

- Missing Value 1.07%
- No Duplicated Data



Feature Encoding and Feature One Hot Encoding

- Feature Encoding, membuat value pada setiap feature dalam skala 1 - 5
- Feature One Hote Encoding, membuat prefis untuk masing-masing feature bernilai 1 jika Yes dan 0 jika No



Feature Standardization

Teknik yang digunakan untuk membuat feature numeric memiliki mean 0 dan std 1

```
from sklearn.preprocessing import StandardScaler
dataset_scaled = dataset.copy()
ss = StandardScaler()

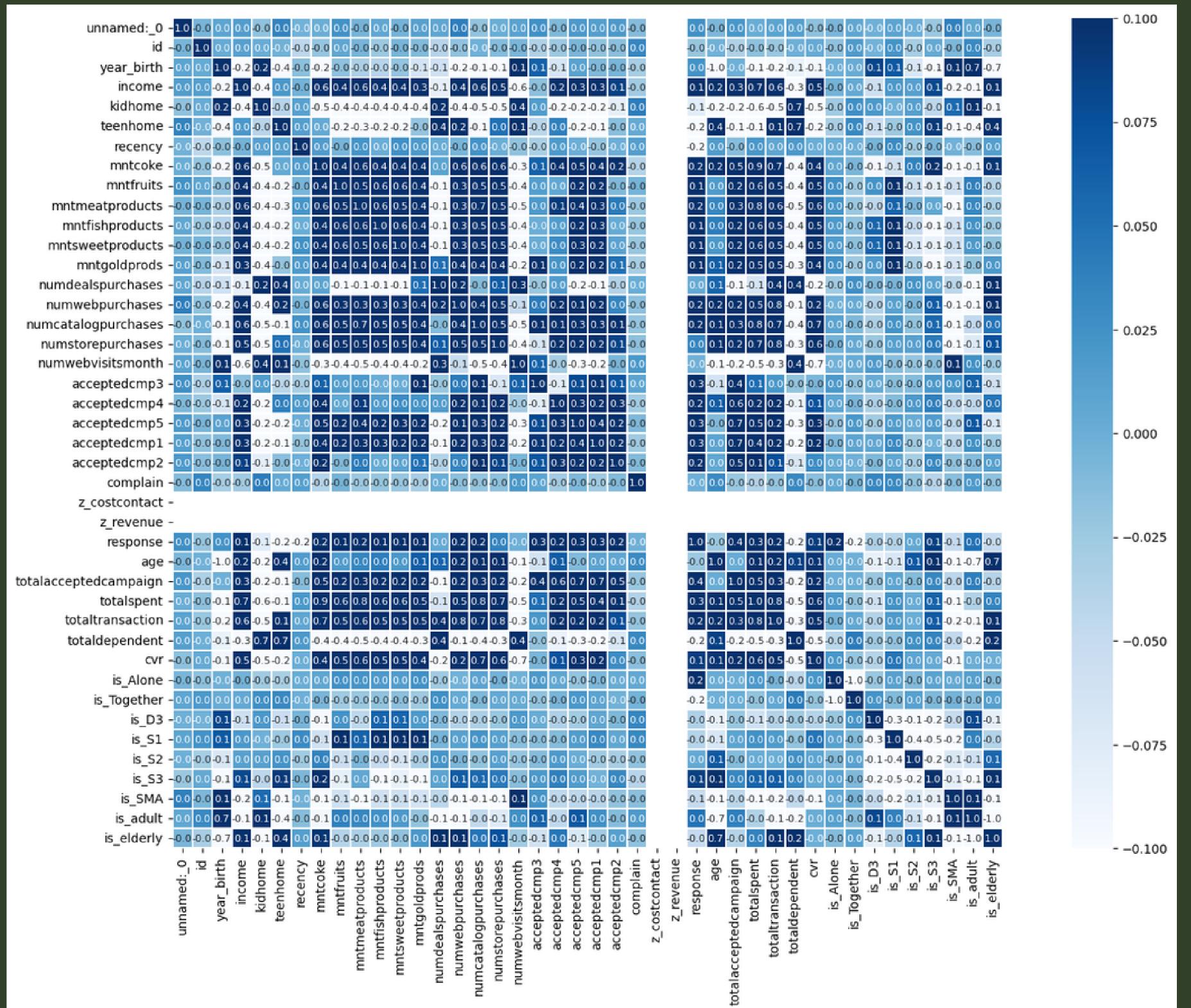
for col in numerics:
    dataset_scaled[col] = ss.fit_transform(dataset_scaled[[col]])

display(dataset_scaled.shape, dataset_scaled.head(3))
```

Exploratory Data

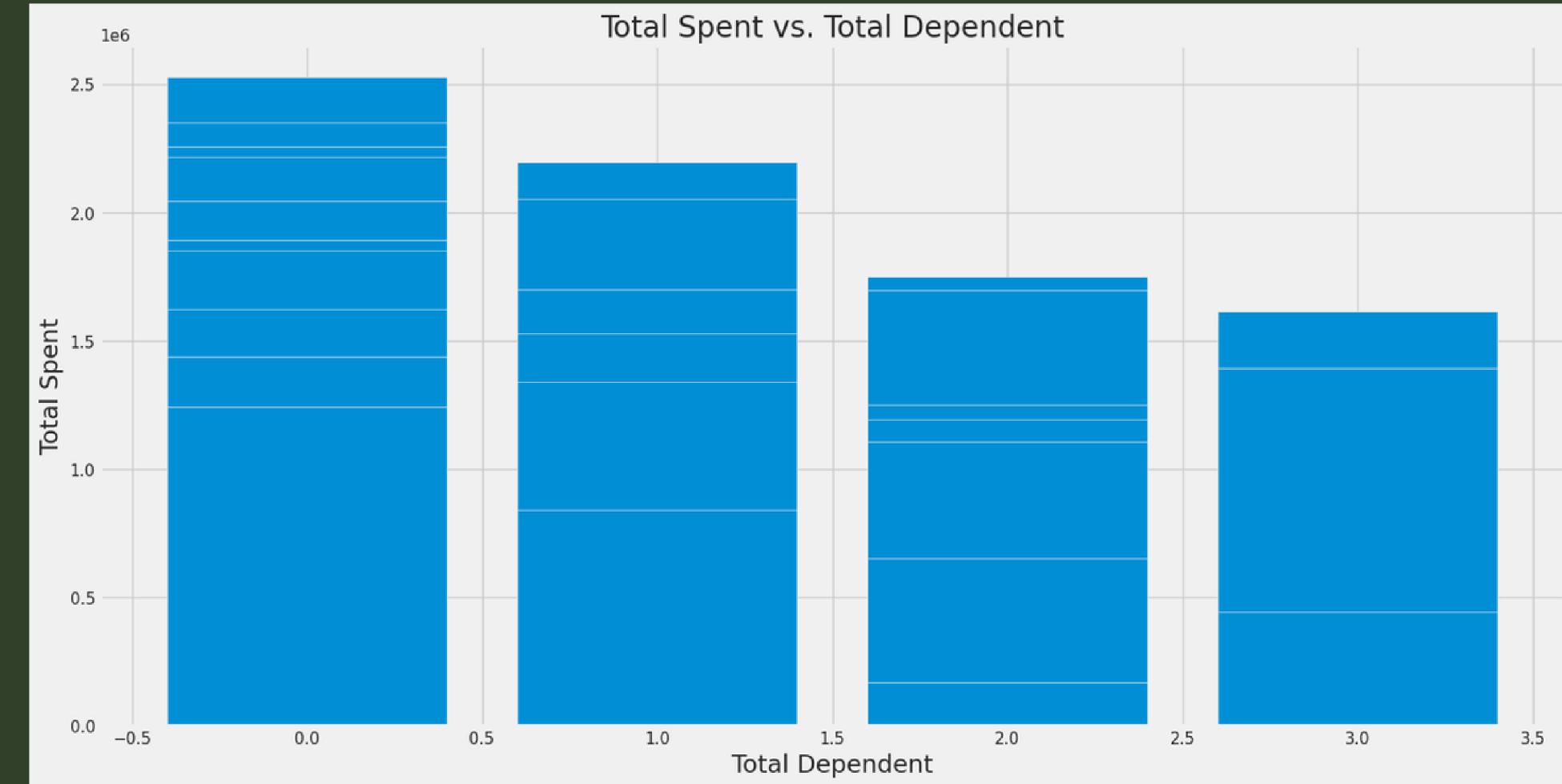
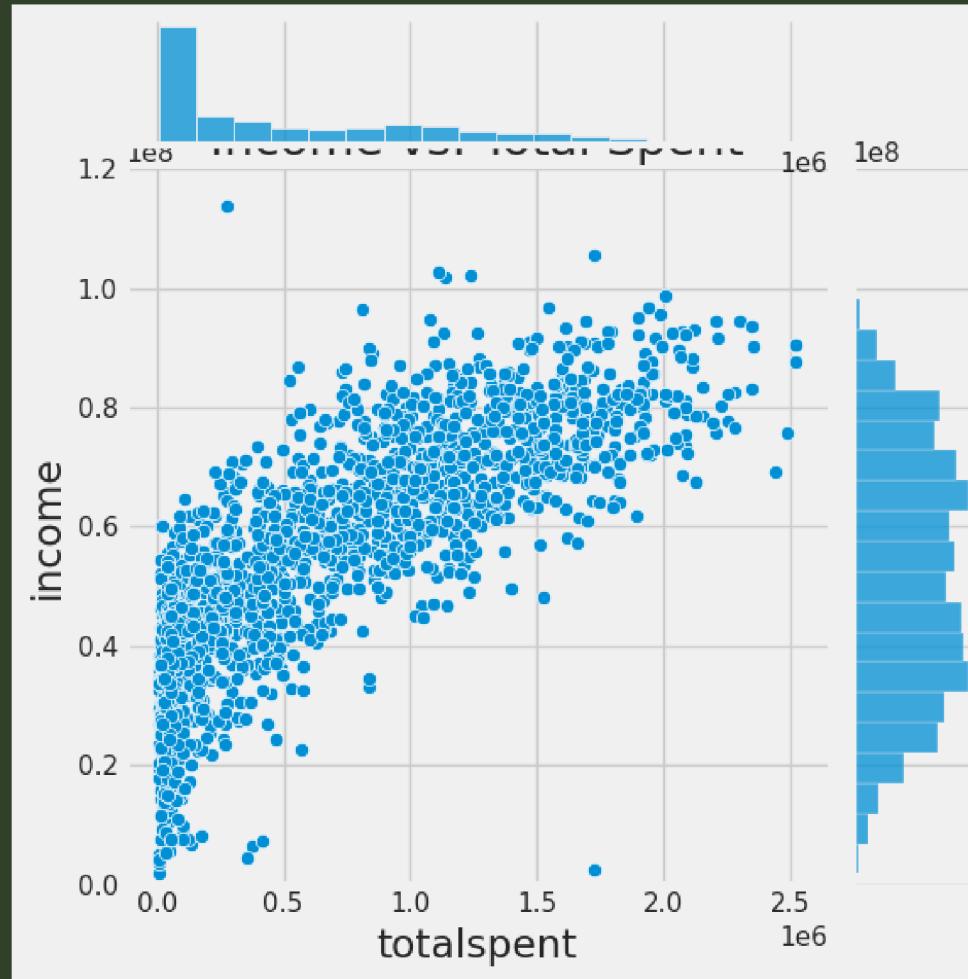


Using Scatterplot for Multivariate Analysis



Insight ...

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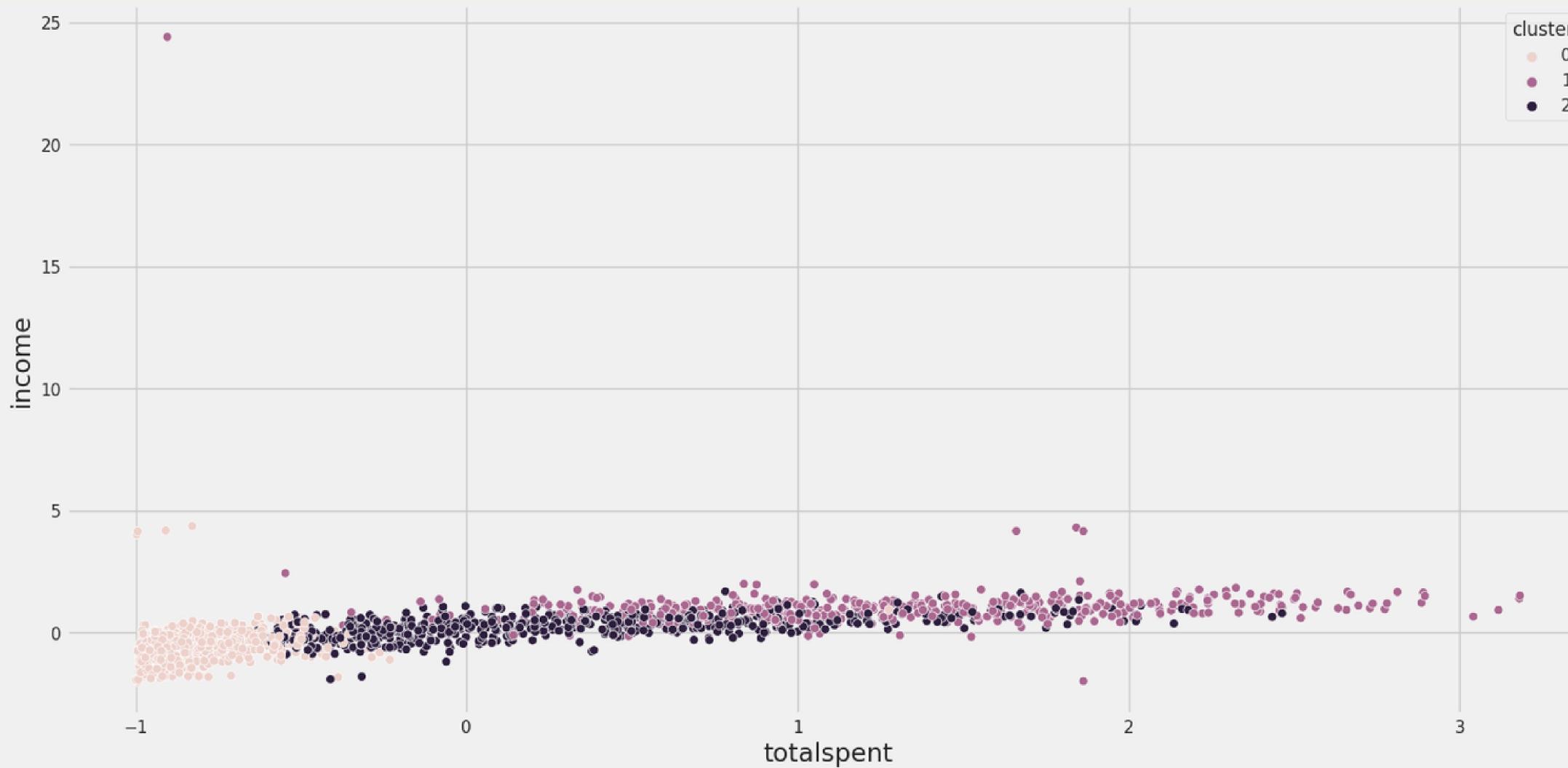


KECENDERUNGAN TOTAL SPENT AKAN NAIK
KETIKA INCOME NAIK DAN ATAU TOTAL
DEPENDENT TURUN.

*Income, Total Spent
and Total Dependent*

Modelling

```
▶ from sklearn.cluster import KMeans  
  
kmeans = KMeans(n_clusters=3, init='k-means++', max_iter=300, n_init=10, random_state=10)  
kmeans.fit(X.values)  
X['cluster'] = kmeans.labels_  
dataset['cluster'] = kmeans.labels_ #Menempelkan kembali di data yang digunakan
```



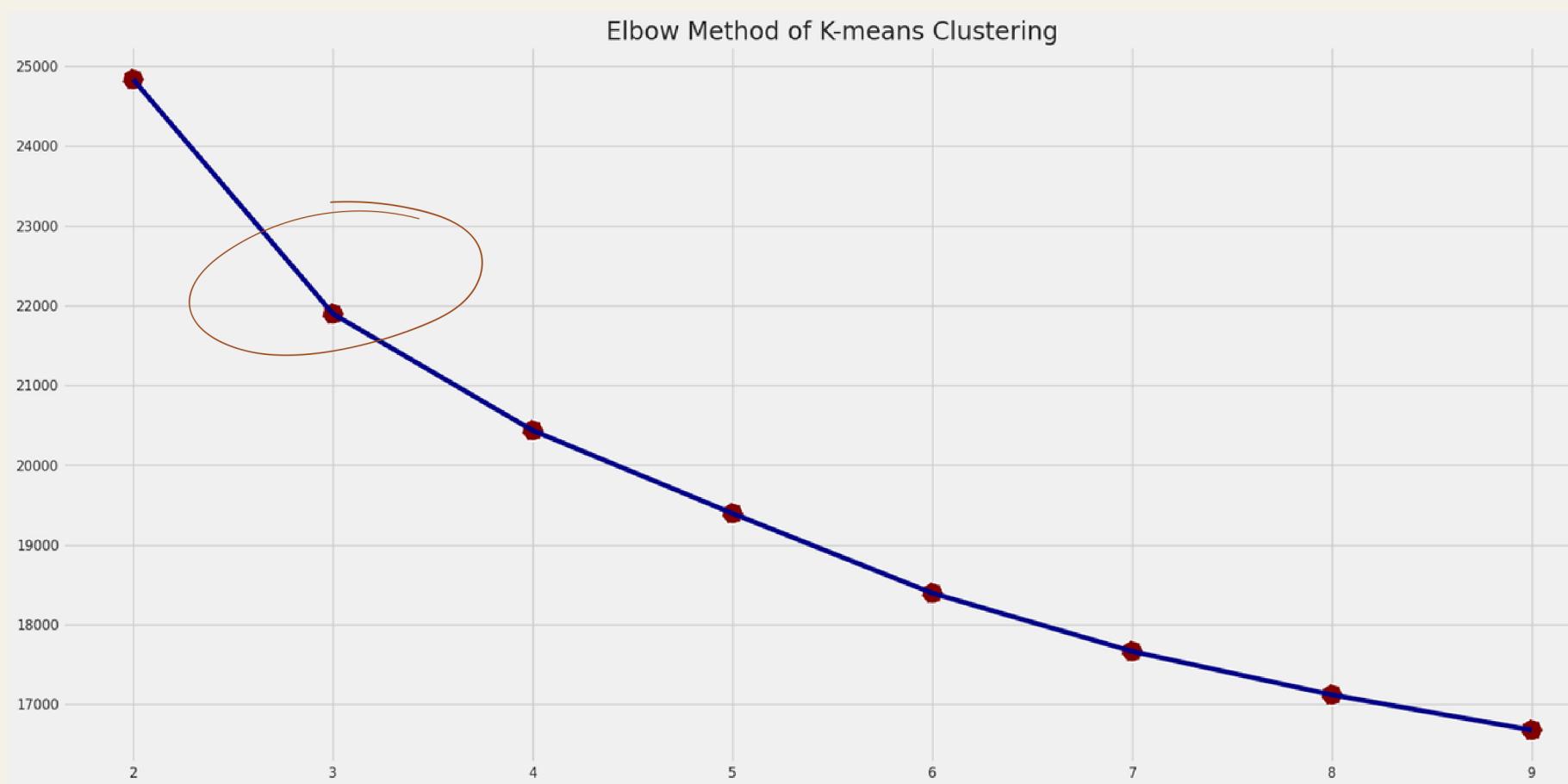
Q3-Q4 2022

K-Means Algorithm

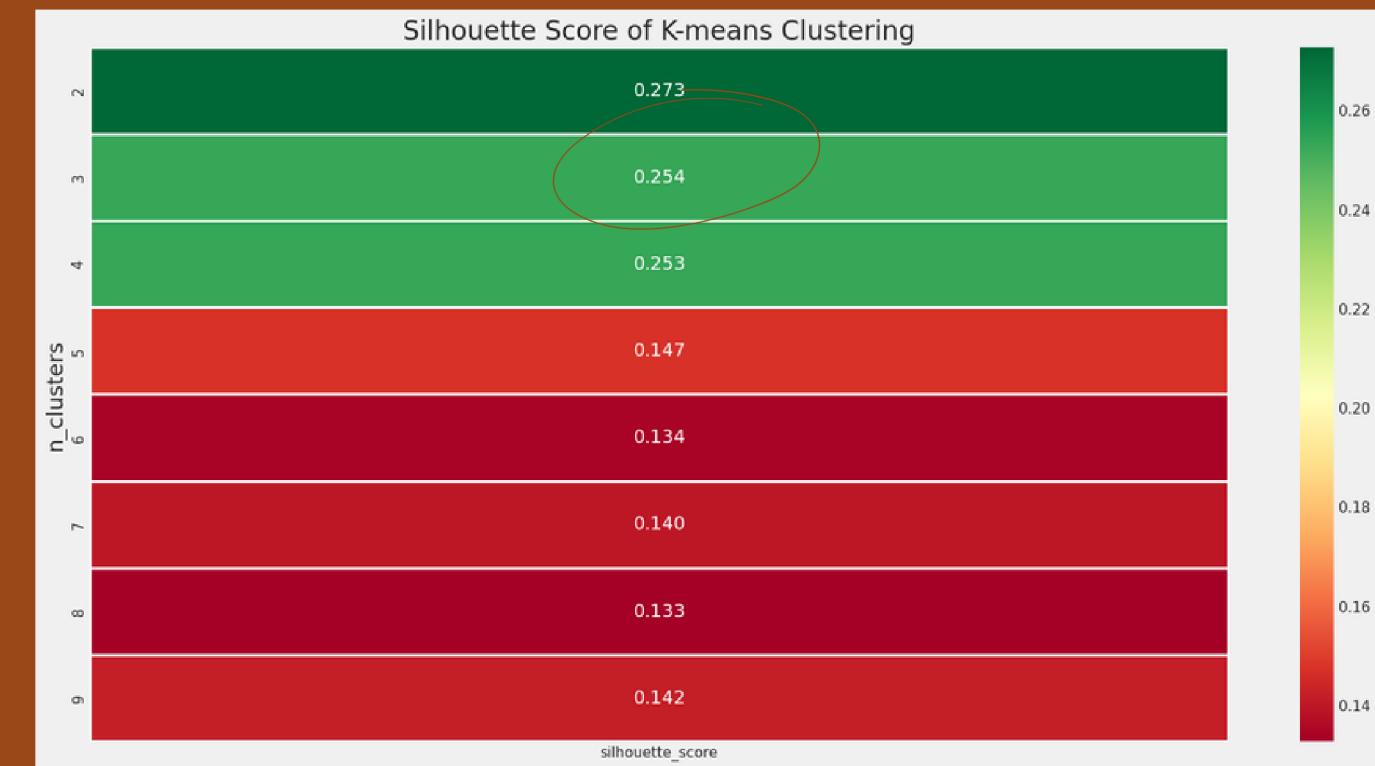
adalah algoritma yang digunakan untuk melakukan clustering.

Model Evaluation

O1 ELBOW METHOD



O2 SILHOUETTE



Customer Segmentation Result

Risk Customer	Potential Customer	Target Customer
Frekuensi transaksi dan spent yang rendah terhadap perusahaan	Frekuensi transaksi dan spent yang cenderung tinggi	Frekuensi transaksi dan spent yang sangat tinggi
Memiliki income rendah, tanggungan tinggi	Memiliki income dan tanggungan yang tinggi	Memiliki income yang tinggi, tanggungan yang rendah
Catalogpurchases dan Storepurchases	Dealspurchases, Webpurchases dan Storepurchases	Catalogpurchases dan Storepurchases
Total kunjungan pada web perusahaan sangat tinggi namun tingkat acceptance rate campaign dan CVR yang sangat rendah	Total kunjungan web cenderung tinggi namun tingkat acceptance rate dan CVR yang rendah	Total kunjungan web sangat rendah, namun tingkat acceptance rate pada campaign dan CVR sangat tinggi
<p>Masing-masing hasil segmentasi tidak menunjukkan perbedaan signifikan terhadap Age dan Recency.</p>		
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Business Recommendation for *Potential Customer*

1. Promo dan Cross selling untuk produk kebutuhan rumah tangga dan anak.
2. Memberikan voucher untuk setiap pembelian pada Dealspurchases, Webpurchases dan Storepurchases
3. Baik untuk menjadi target campaign namun perlu dipertimbangkan karakteristik lebih jauh





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Business Recommendation for *Target Customer*

1. Menginisiasi kerjasama dengan bank, untuk memberikan fasilitas seperti pembayaran kebutuhan lebih fleksibel untuk member card gold dan platinum
2. Strategi cross selling untuk produk sepe
3. Direkomendasikan campaign dapat dilakukan secara personal tidak hanya melalui web