



# **UofT Credit Union Limited**

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## BACKGROUND OF THE COMPANY

UofT Credit Union is a financial institution that provides financial services including checking and saving accounts, financial advice, mortgages and more.

# CURRENT PROBLEM

**Digital engagement between the company and customers is lower than the expected rate.**

This project will focus on existing customer data such as **demography, financial status, and spending behaviors. (Payment types and amounts.)**. According to the result of the analysis, the Machine Learning model will help us to target customer types in order to enhance online engagement by marketing campaigns.

## **MOTIVATION**

Advantages of branchless banking

Personalisation: customized offers, financial advice, and notifications.

Reducing the process types for all kind of application.

Expanding the companie's active areas.

and

## **INCREASING THE PROFIT**

# Database

## AWS RDS/S3 - Postgresql

- ✓ **Tables (5)**
  - atm\_payments
  - online\_autpay
  - owners
  - tappos
  - walletmobile
- Trigger Functions
- Types
- ✓ **Views (2)**
  - ownerscomplete
  - ownerstransactions

```
1  create or replace view OwnersTransactions as
2  with
3
4    walletmobilet as (select id, count(id), sum(abs(amount)) as Amount from walletmobile group by id order by id),
5    tappost as (select id, count(id), sum(abs(amount)) as Amount from tappos group by id order by id),
6    online_autpayt as (select id, count(id), sum(abs(amount)) as Amount from online_autpay group by id order by id),
7    atm_paymentst as (select id, count(id), sum(abs(amount)) as Amount from atm_payments group by id order by id)
8
9    select a.id,
10      a.sex as gender,
11      (select extract(YEAR FROM AGE(CURRENT_DATE, a.bdate))) as Age,
12      a.status as status,
13      a.marital as marital,
14      a.city as city,
15      a.region as region,
16      a.country as country,
17      case when b.id isnull then 0 else b.count end as CountWallet,
18      case when b.amount isnull then 0 else b.amount end as SumWallet,
19      case when c.count isnull then 0 else c.count end as CountTapPos,
20      case when c.amount isnull then 0 else c.amount end as SumTapPos,
21      case when d.count isnull then 0 else d.count end as CountOnlineAut,
22      case when d.amount isnull then 0 else d.amount end as SumOnlineAut,
23      case when e.count isnull then 0 else e.count end as CountATM,
24      case when e.amount isnull then 0 else e.amount end as SumATM
25      from owners a
26      left join walletmobilet b on b.id = a.id
27      left join tappost c on c.id = a.id
28      left join online_autpayt d on d.id = a.id
29      left join atm_paymentst e on e.id = a.id
30
```

# Data consist of...

**Demographic information** such as age, marital status, gender, location..

**Financial Information** ATM Payments, Online Debit Authorizations, Onlina Wallet Usage (Samsung, Google, Apple...) and Pos Machine taps

**Year:**2018

# Machine Learning Model

# Unsupervised Model

## Advantage

Learn the trends and patterns of the data without specifying an output

Labels can be added after the data has been analyzed and clustered

## Why?

To look for trends and patterns in the data and cluster the data set based on the these trends

## Disadvantage

Lack of transparency with the results due to not having a foundation for the clustering

# Clean & Transform

Check for null  
values

Drop irrelevant  
columns

LabelEncoder  
Convert string datatypes to  
integers

# Standardize The Data

## MinMaxScaler()

Normalize the data and keep it consistent

Rescale the features individually and make the data less sensitive to outliers

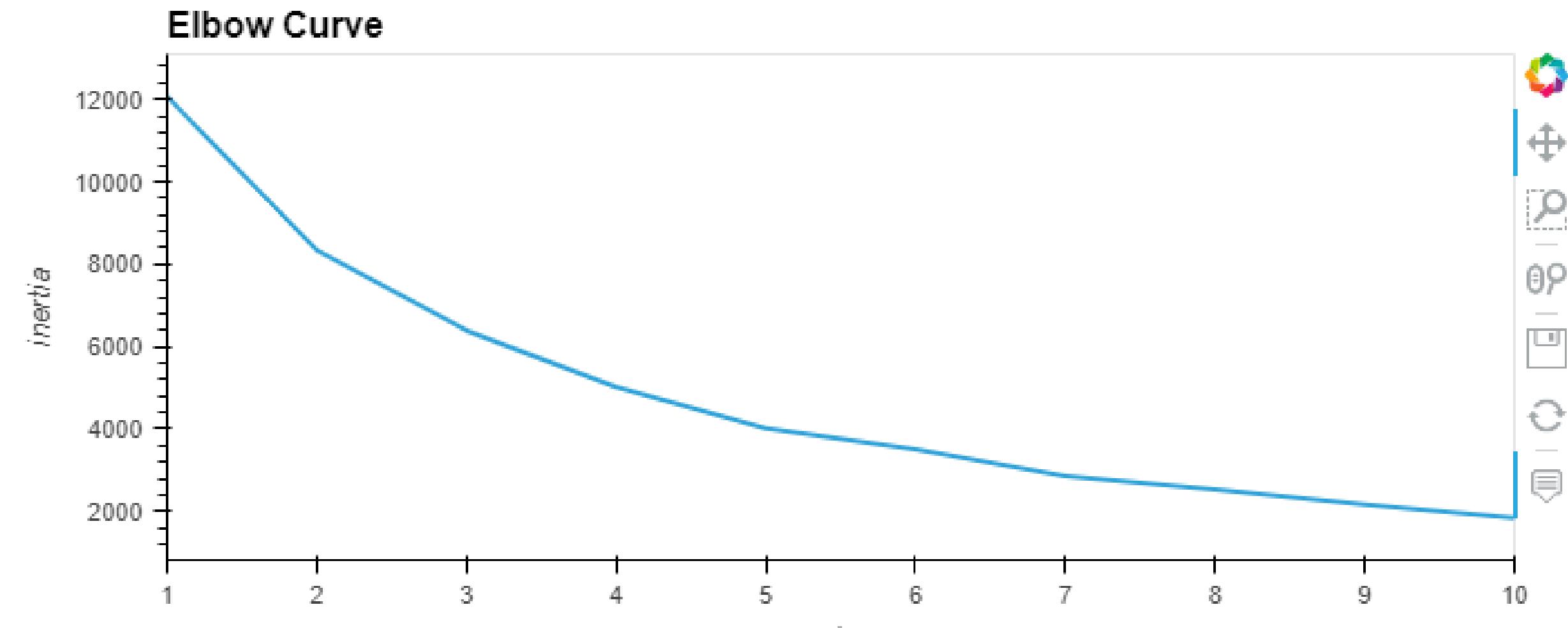
# Dimensionality Reduction & K-means

Reduces the data to a manageable size while preserving the integrity of the data set through

- PCA method

K-means algorithm used to segment data into predefined clusters

- Elbow curve



# Model and Predict

Data is pre-processed

Dimensions are reduced

K-means model is initialized



Fit the model with the processed data

Predict the clusters from the model

Analyze the Results

# Dashboard

[https://public.tableau.com/views/UofT\\_Dashboard\\_finalproject/UofTCreditUnion-ClusteringAnalysis?:language=en-US&publish=yes&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/UofT_Dashboard_finalproject/UofTCreditUnion-ClusteringAnalysis?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link)