

# Customer Loan Prediction

Flatiron School

Arman Hussain

---

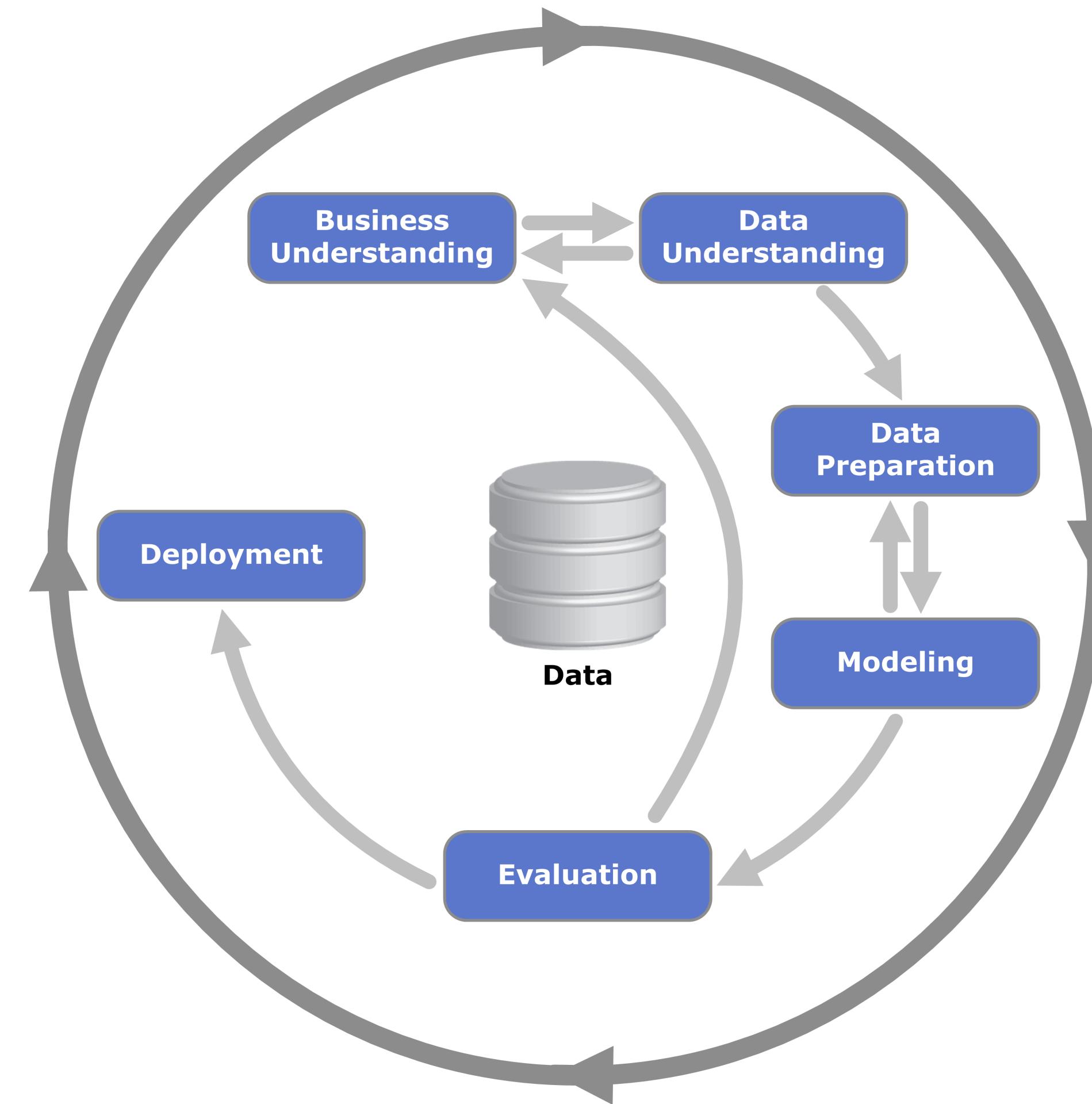
# AGENDA

Universal Banking Corporation

- Introduction
- Methodology
- Findings
- Future Work
- Contact Info

# APPLYING THE CRISP-DM MODEL TO OUR PROBLEM

Universal Banking Corporation



# PROJECT OBJECTIVE

WHAT ARE WE TRYING TO ACHIEVE?

The objective of the project was to predict the likelihood of a customer obtaining a loan from UBC, on the basis the customer is invited to apply for a loan.



## Business Understanding

Building a predictive model like this improves the rate at which banks can offer loans to customers and reduces the overheads from reaching external customers and other attentive ventures.



## Data Understanding

The data for this project was obtained utilising the Bank Loan Modelling and California Housing from Kaggle.

Data was cleaned and formatted appropriately  
Additional columns were created for further exploration



## Modelling

Logistic Regression - Random Forest Classifier  
- Decision Trees Classifier

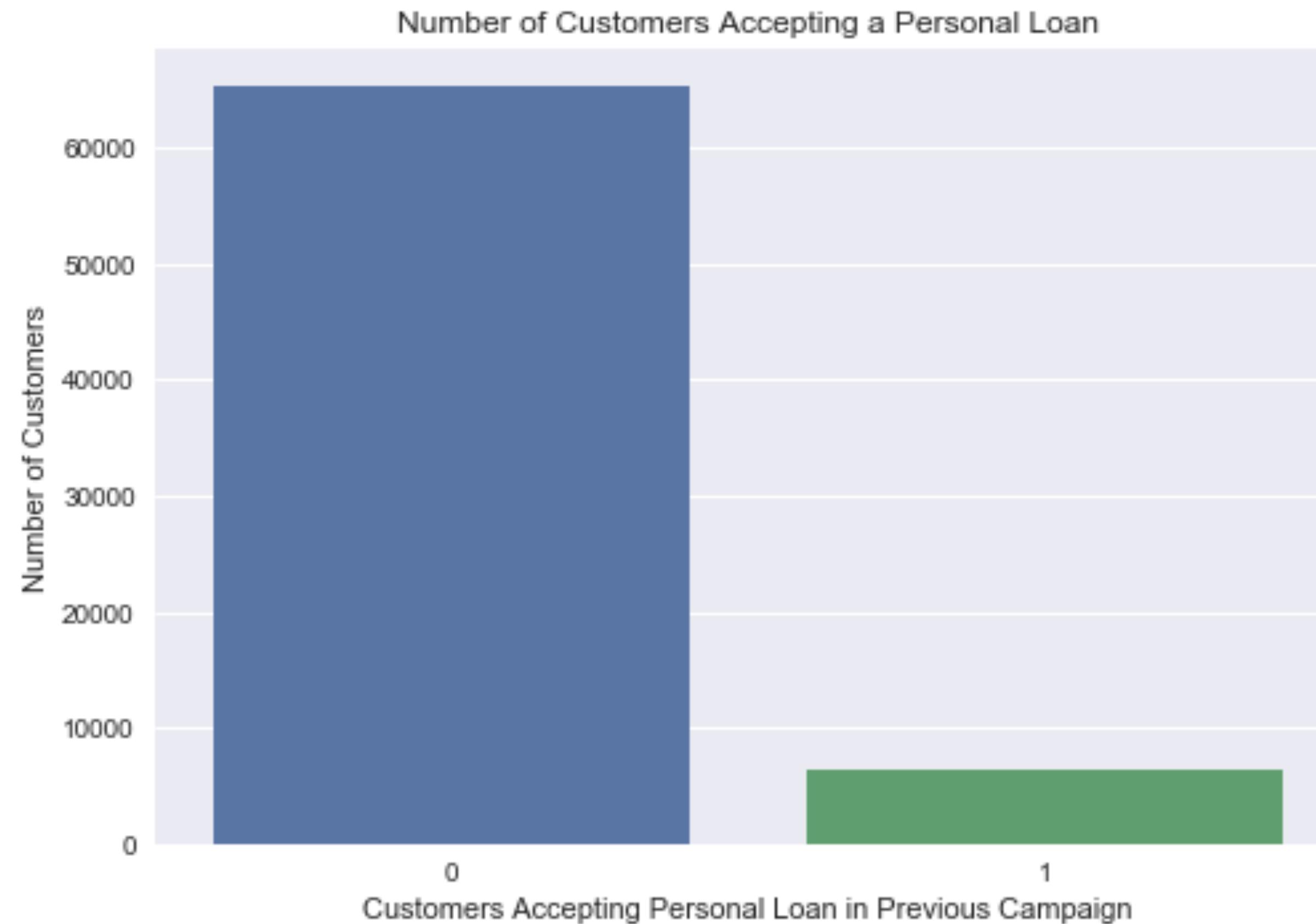


## Evaluation

Analysing the metrics of the best performing model

# FINDINGS

Exploratory Data Analysis



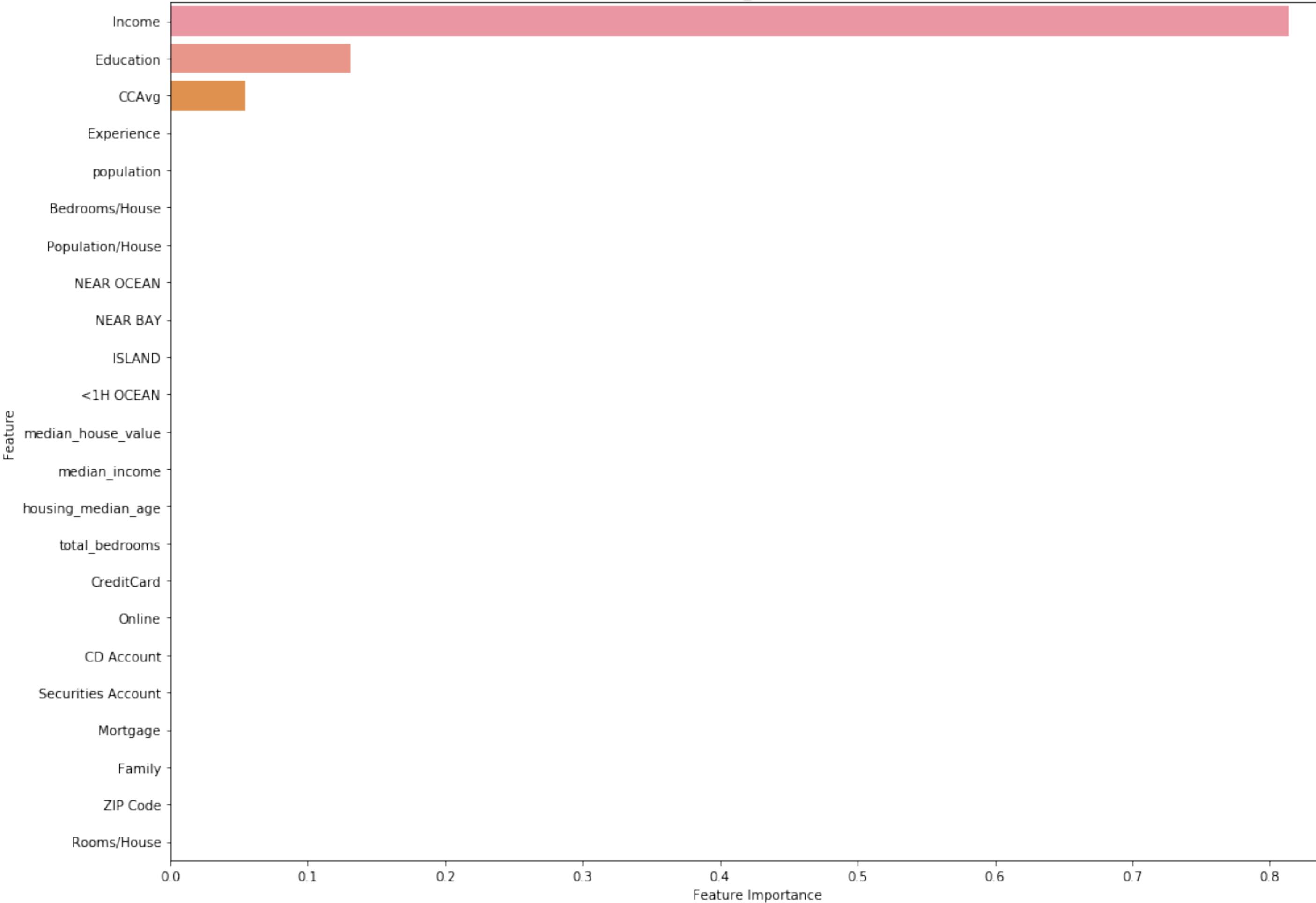
Loan Acceptance Rate

The imbalanced data set was acknowledged during modelling

# Impactive Features

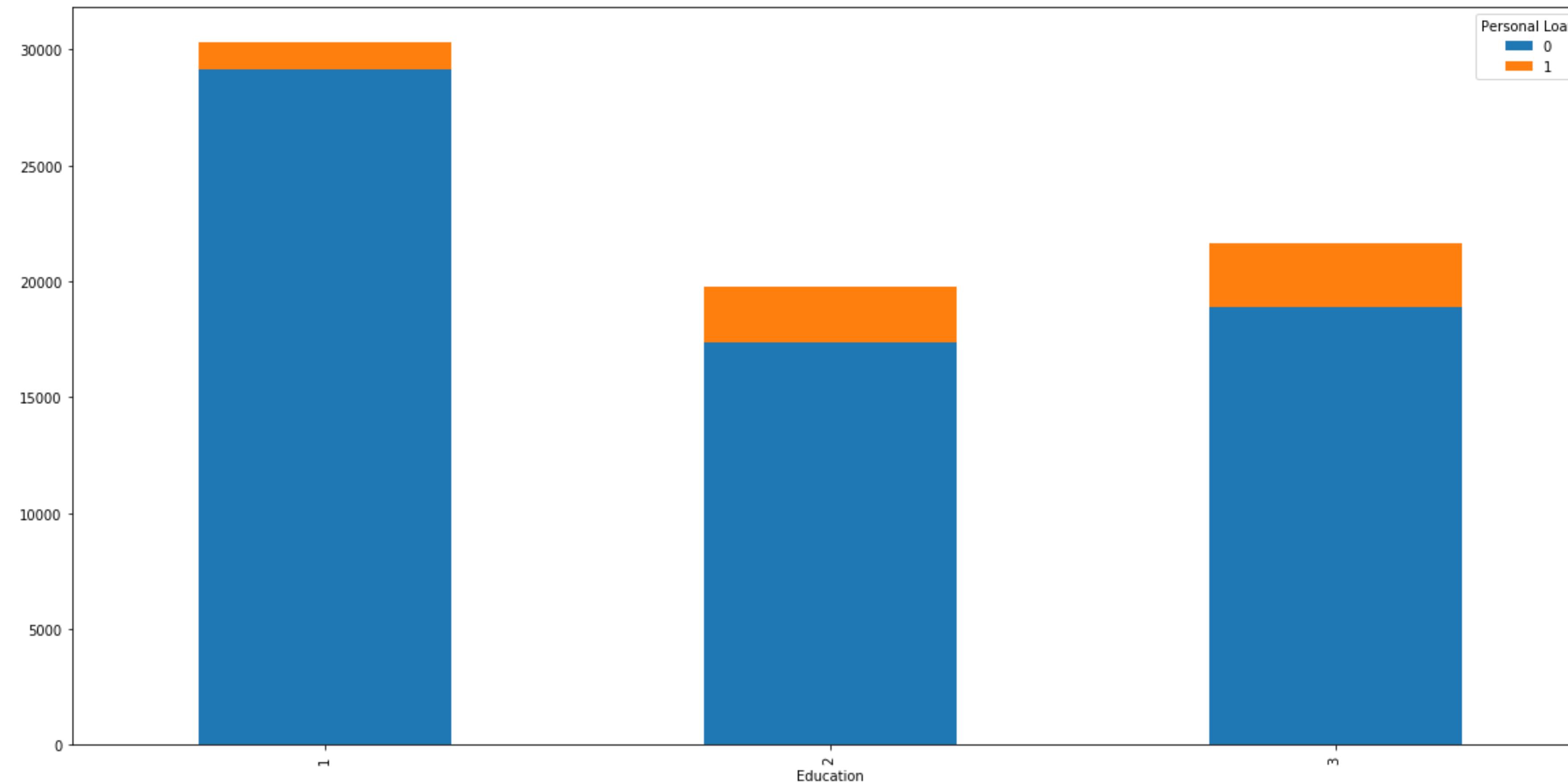
Universal Banking Corporation

Feature Ranking in Decision Tree



# FINDINGS

Exploratory Data Analysis

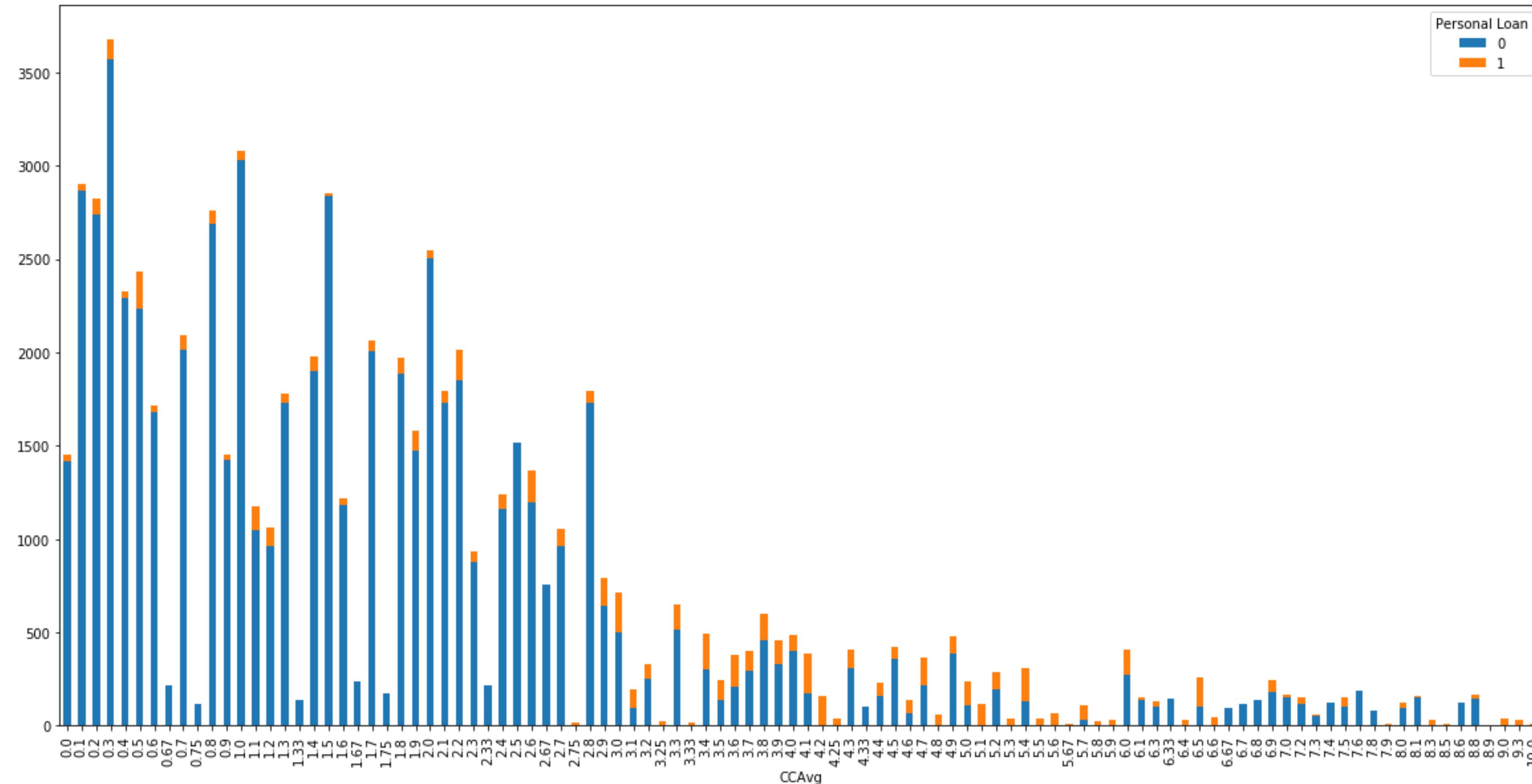


Education Level on Personal Loan

Customers with Advanced/Professional Qualifications fared highest

# FINDINGS

Exploratory Data Analysis

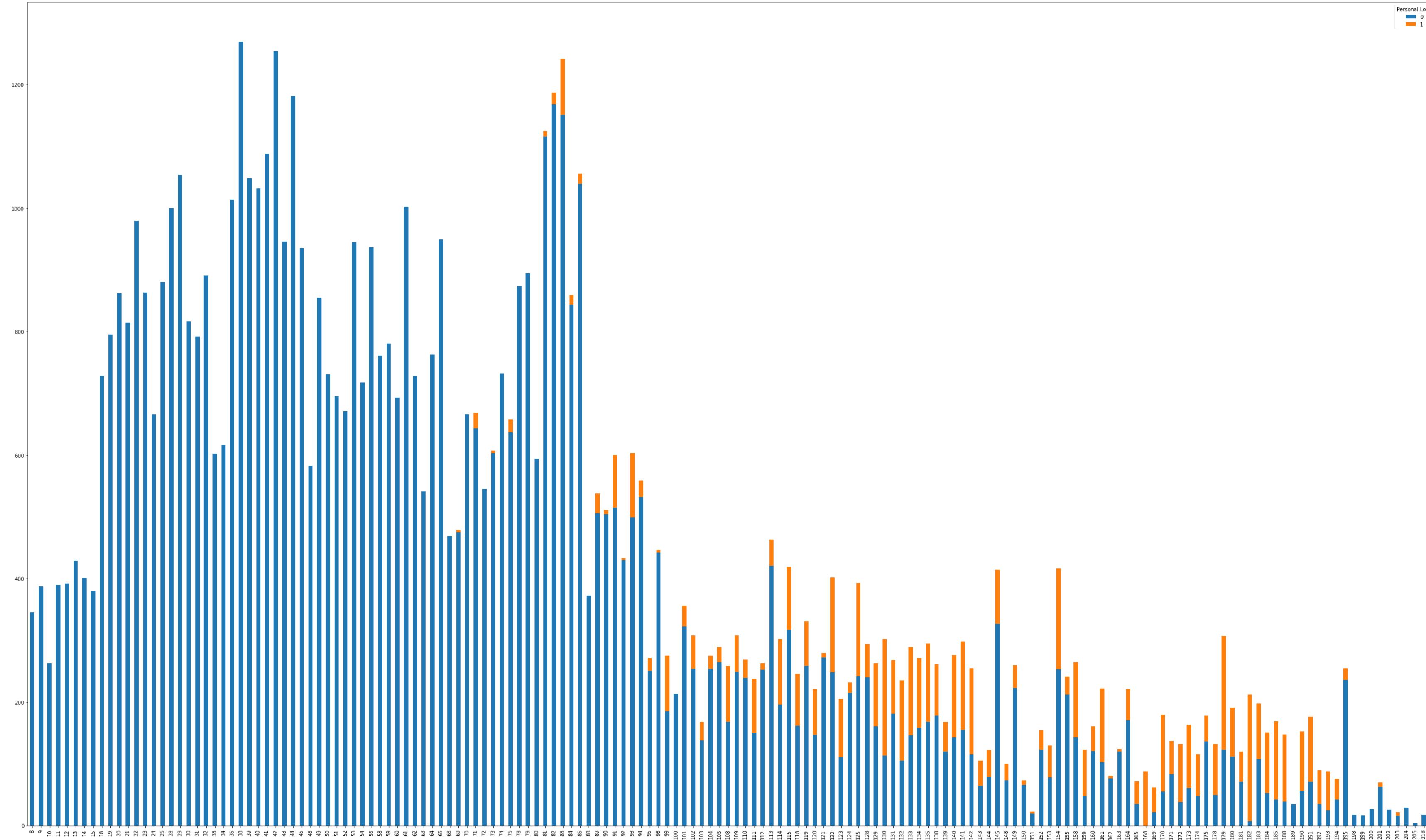


Credit Card Average spending on Personal Loan

CCAvg was the 2nd most influential variable on Personal Loan

# FINDINGS

## Exploratory Data Analysis

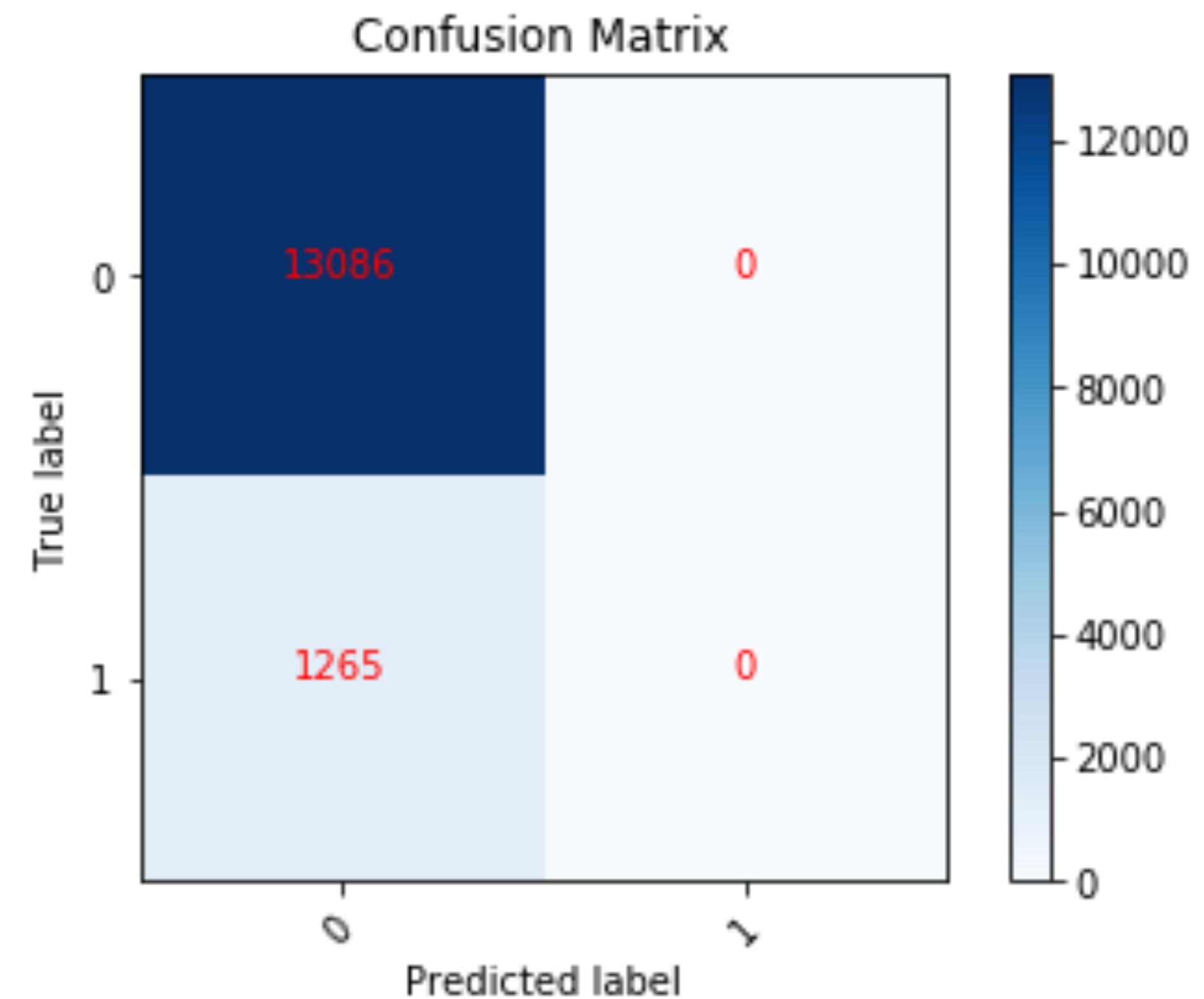


Effect of Income on Personal Loan

Customers with Advanced/Professional Qualifications fared highest

# Potential Savings

Universal Banking Corporation



- £253,000 is what UBC would incur in customer attrition based on all our False Negative value of 1265

# EVALUATION

Universal Banking Corporation

- Best performing model was Decision Tree after conducting Hyperparameter Tuning Optimisation (HTO).
- Further investigated for multicollinearity, overfitting, and data leakage.
- 95% accuracy on Test data.
- Baseline Logistic Regression model achieved 90.1% ROC\_AUC score pre HTO.

# FUTURE WORK

Universal Banking Corporation

- Producing additional models:
  1. Support Vector Machines
  2. XGBoost
- Using neural networks to detect loan recovery rates following loan acceptance.
- Applying our hyper parameters to other economical datasets of similar binary classification problems

# Actionable Problem Solving Recommendations

What can Universal Banking Corporation do to improve their efficiency with customer relationships?

## Further Loan Products

Mortgages, Personal Loan,  
Credit Cards

Solution 1

## Reduced Interest Rates

Offer customers likely to decline loan a better offer

Solution 2

## Analyse Customer Spending Habits

Banking products should be tailored to customers specifically

Solution 3

## Improved Digital Banking

Reducing costs on billboards and TV and focusing on reducing fraud to bring in new clients

Solution 4

---

# Contact Info

[arman\\_hussain786@hotmail.com](mailto:arman_hussain786@hotmail.com)



<https://www.linkedin.com/in/arman-hussain-110793ah/>



## Final Remarks

Through use of carefully engineered Machine Learning models, banks and lending institutions can focus on the features that are meaningful and save on overheads that could be utilised elsewhere, like digital acquisition of new clients.