

Customer Loan Prediction

Flatiron School

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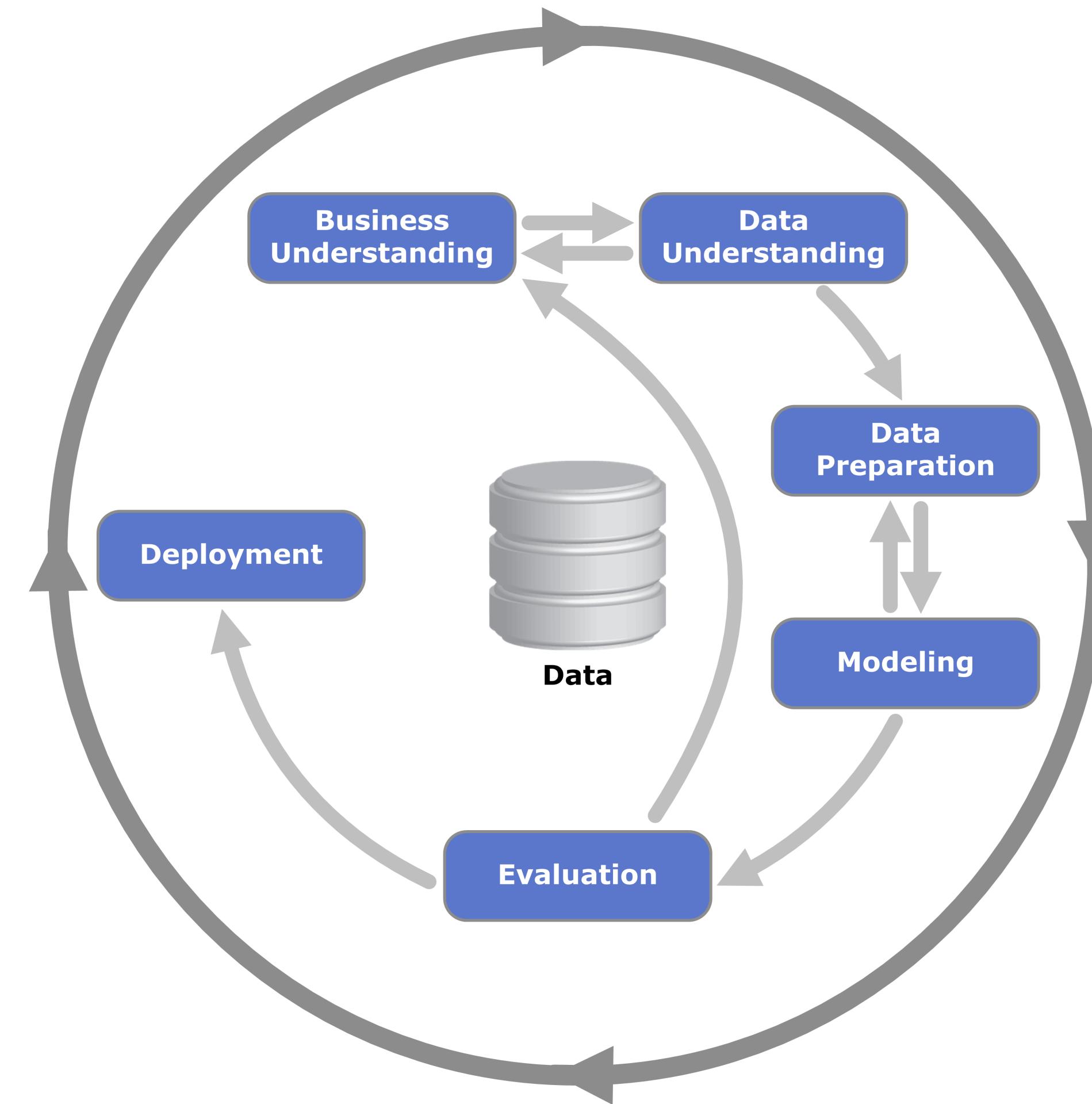
AGENDA

Universal Banking Corporation

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

APPLYING THE CRISP-DM MODEL TO OUR PROBLEM

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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

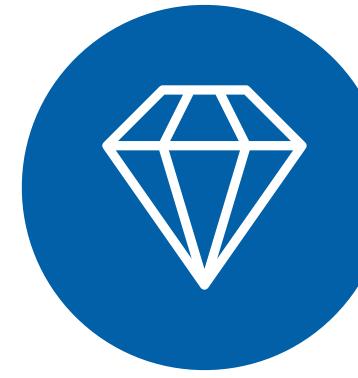
The data for this project was obtained utilising the Bank Loan Modelling and California Housing from Kaggle.

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

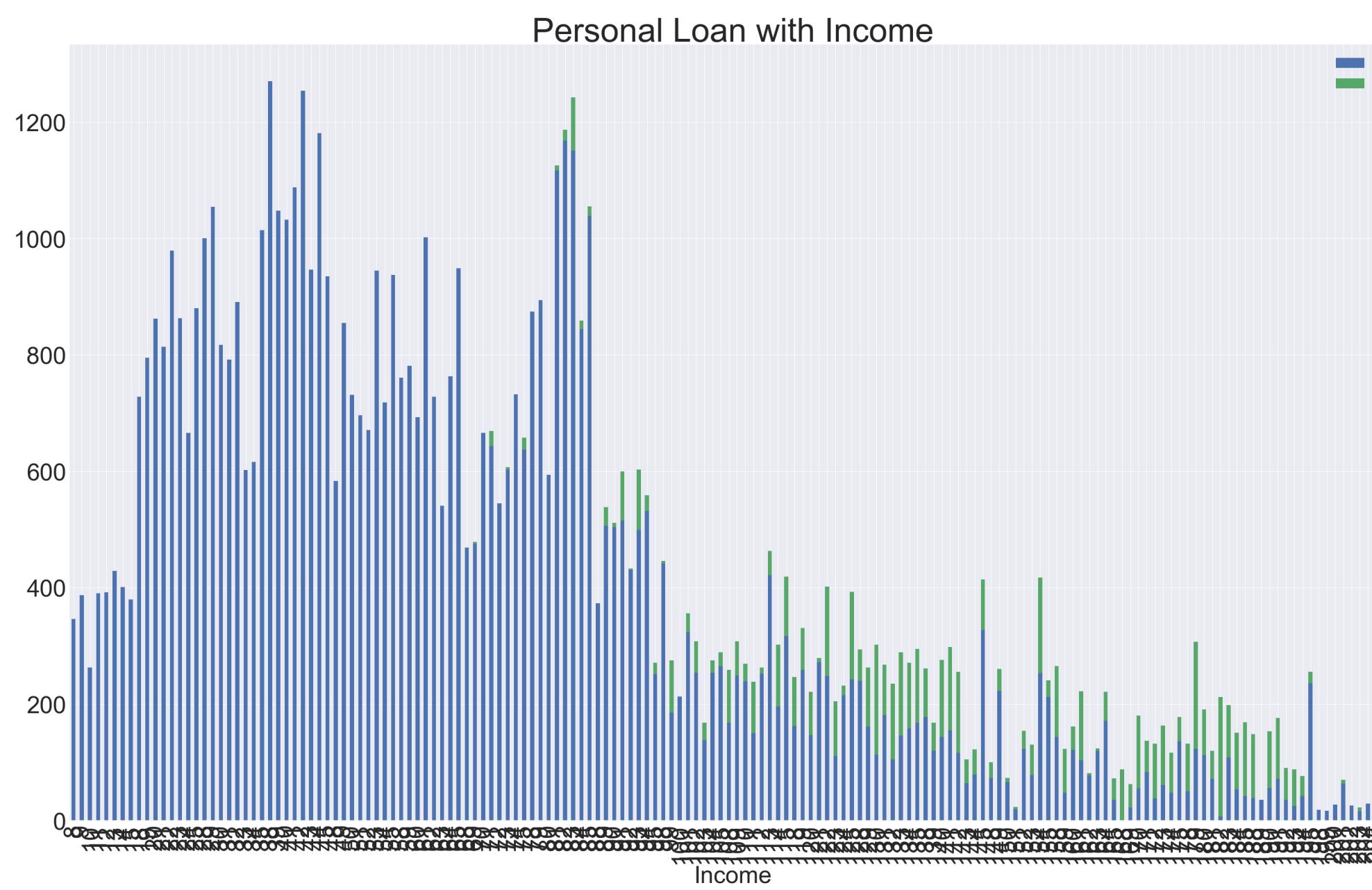
FINDINGS

Exploratory Data Analysis



Loan Acceptance Rate

The imbalanced data set was acknowledged during modelling

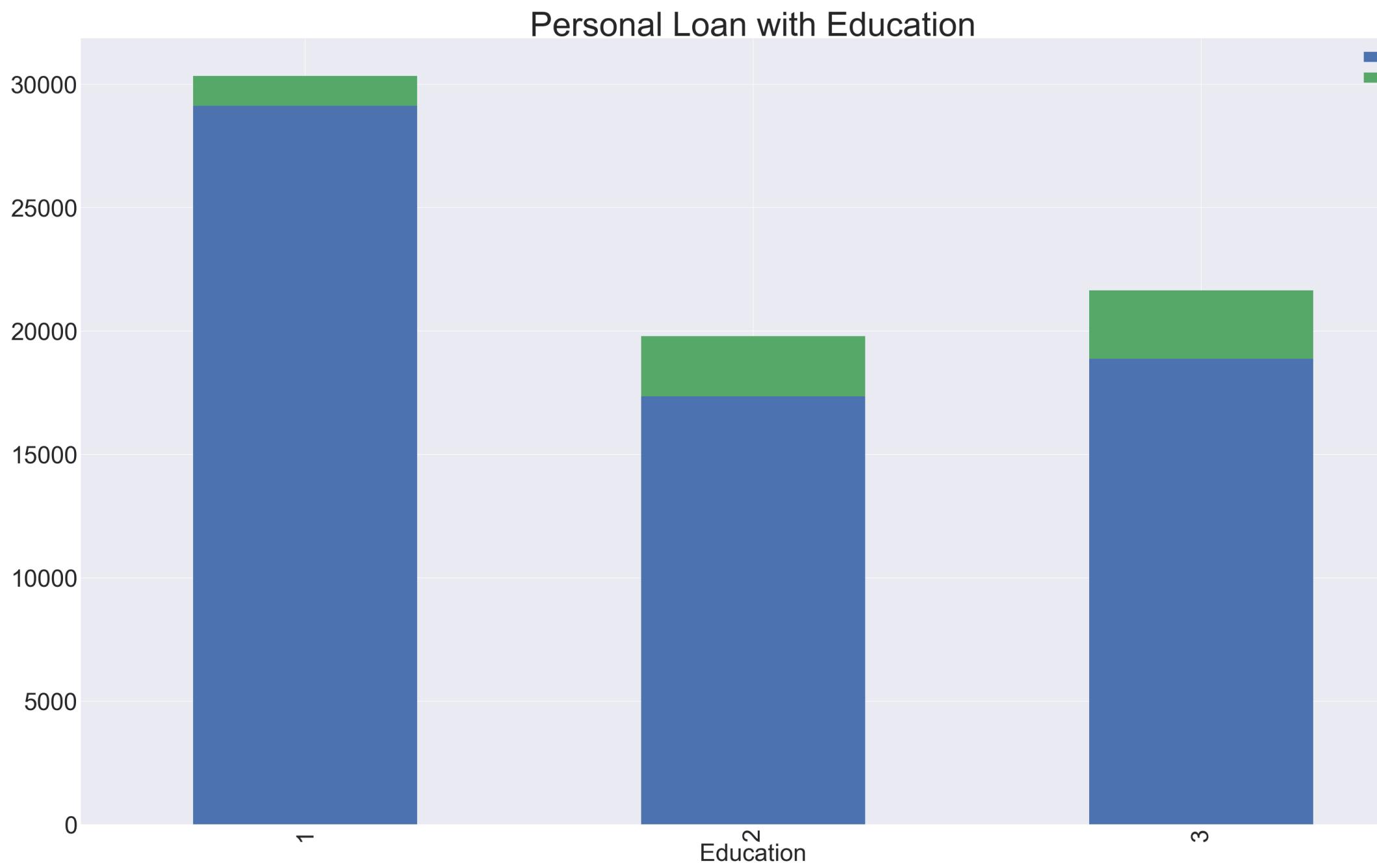


Effect of Income on Personal Loan

Higher income led to greater loan acceptance

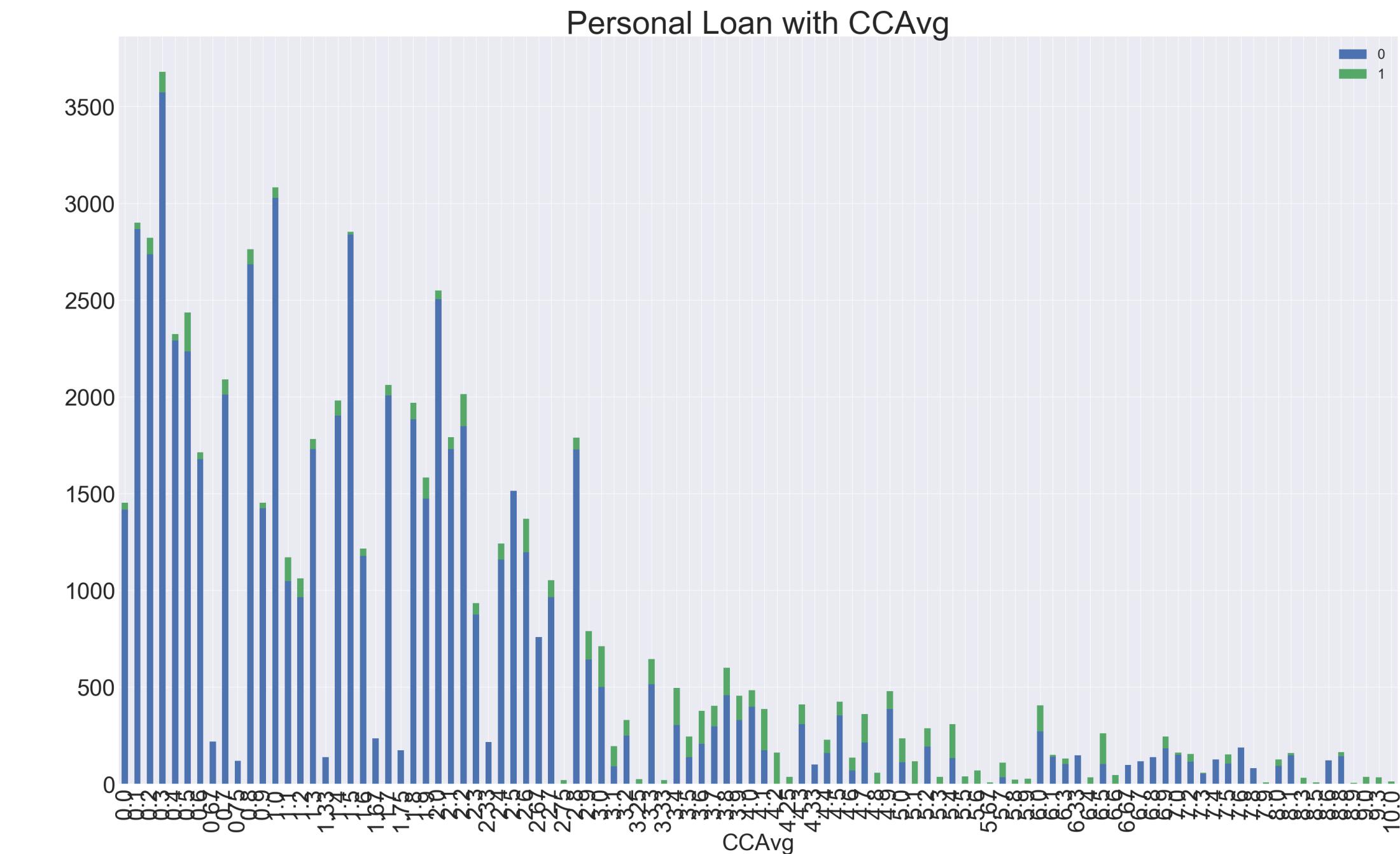
FINDINGS

Exploratory Data Analysis



Education Level on Personal Loan

Customers with Advanced/
Professional Qualifications fared
highest



Credit Card Average spending on Personal Loan

CCAvg was the 2nd most influential
variable on Personal Loan

EVALUATION

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- Best performing model was Decision Tree after conducting Hyperparameter Tuning Optimisation (HTO).
- ROC_AUC score of 99.912% was achieved using GridSearchCV.
- Further investigated for multicollinearity, overfitting, and data leakage.
- Baseline Logistic Regression model achieved 90.1% ROC_AUC score pre HTO.
- An improvement of 9% is significant and was evidently enough to select winning model.

FUTURE WORK

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- Producing additional models:
 1. Gaussian Naive Bayes
 2. Support Vector Machines
 3. XGBoost
 4. K-Nearest Neighbours
- 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

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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.