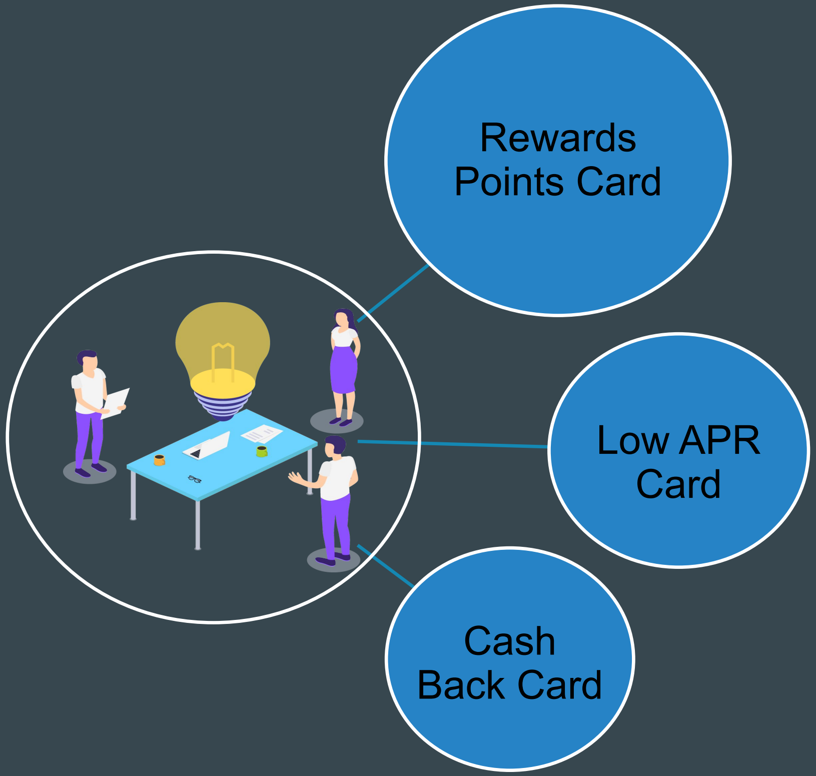
Credit Card Approval Prediction

September, 2021

Introduction

All over the world people use credit card to purchase, it is essential part of the modern society, but credit cards present opportunities and challenge for banks and other lending institutions. On one hand, credit cards create revenue with fees and interest they generated, on the other hand, there is risk that consumers won't repay the balance, and the banks will lose money. With machine learning, will we be able to help a financial institution to decide whether to issue a credit card to an applicant or not?



Overview of the Project

In this project, we will use Python and Machine learning to focus on recognizing, assessing and reducing the financial or other risks that could lead to loss involved in the transaction. Machine Learning can process a large amount of data to arrive at a single decision; whether or not to approve futur credit card applications.

Understanding the problem

what are the standard requirements for an individual to be approved for a credit card?

Project: Credit Card Approval Prediction

Technology Stack

Dataset: downloaded from kaggle https://www.kaggle.com/rikdifos/credit-card-approval-prediction/code

Exploratory Data Analysis — jupyter, python, matplotlib

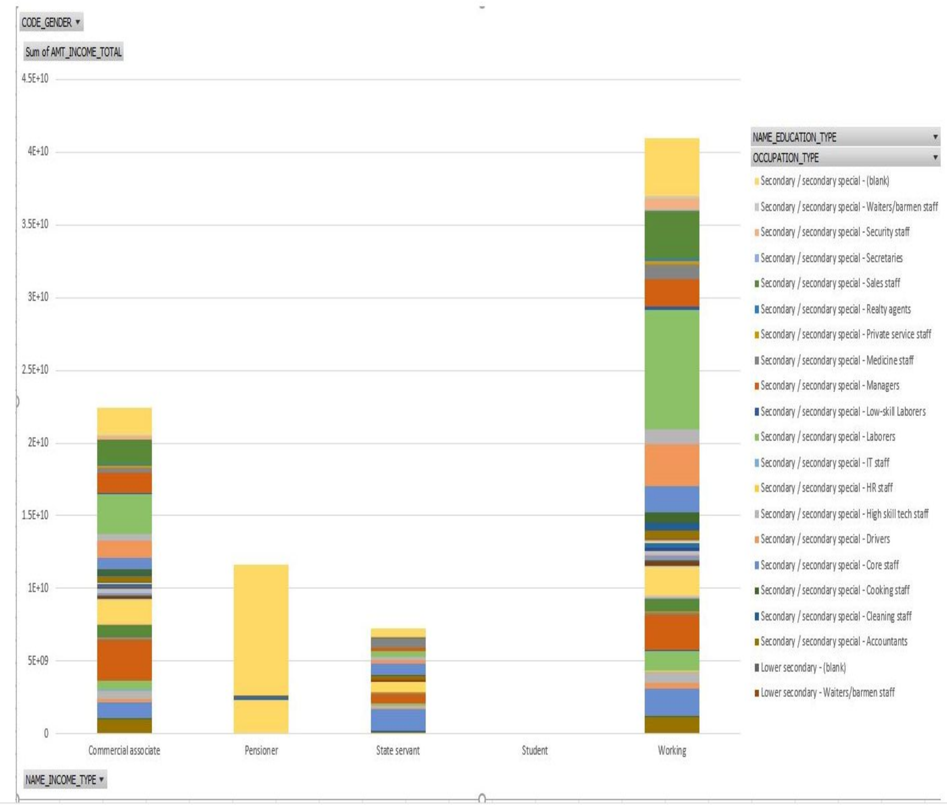
Database, Data Wrangling & Feature Engineering — pandas, PostgreSQL, NumPy

Machine Learning Pipeline — Scikit learn

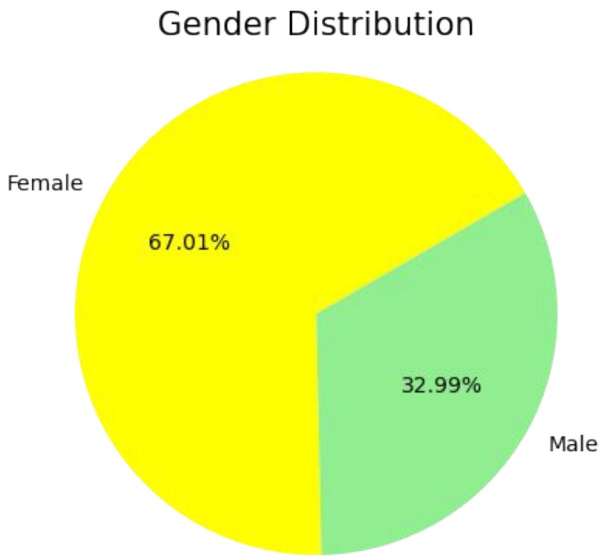
Dashboard Presentation — tableau

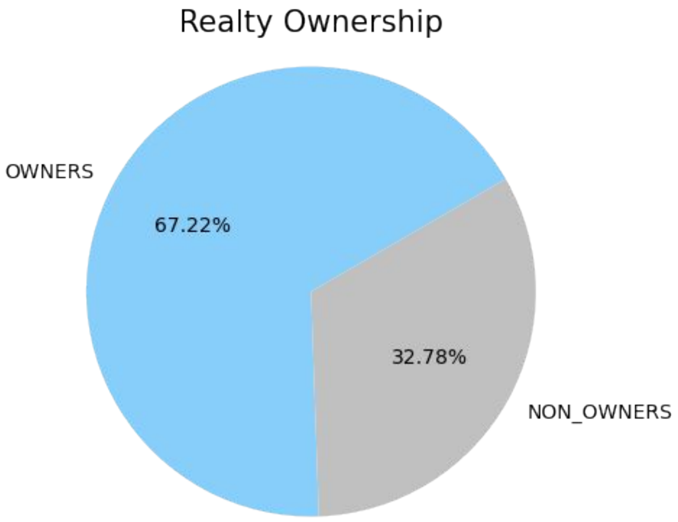
DataSweeper_Project

Data Exploration

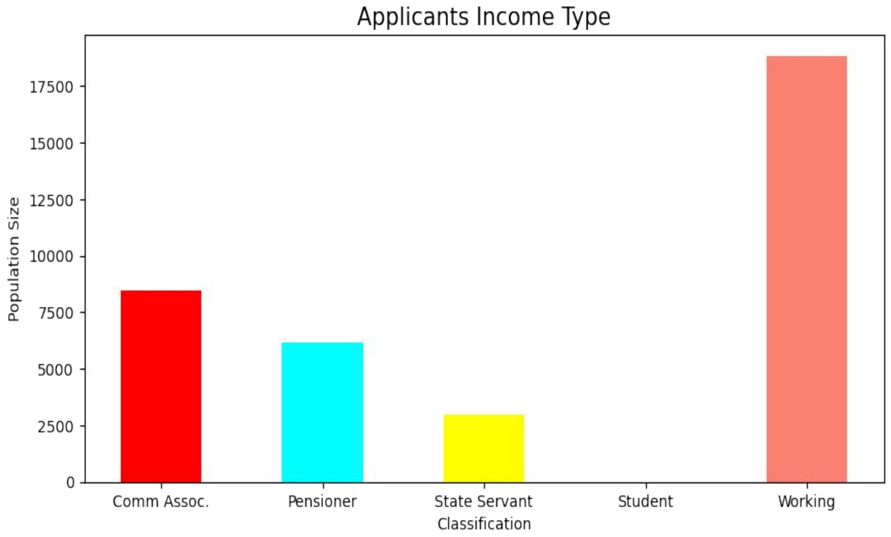


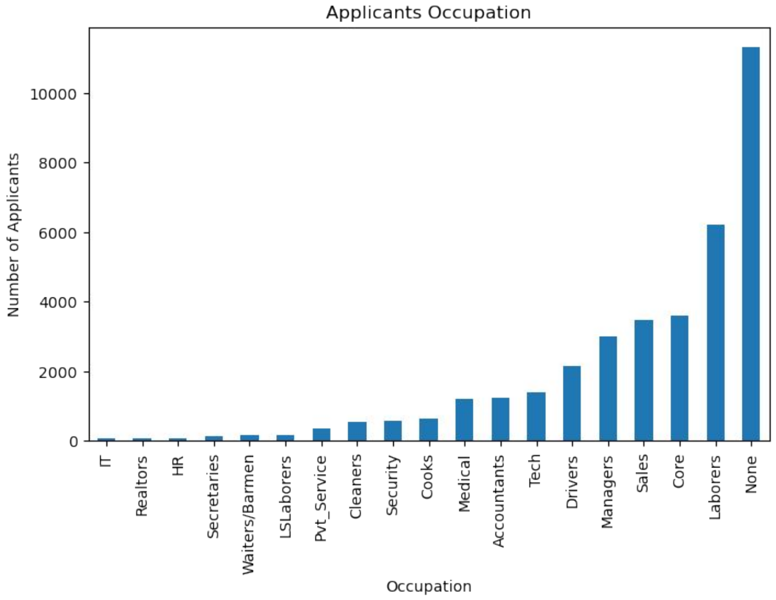
DATASET DEMOGRAPHICS
Gender Distribution and Realty Ownership



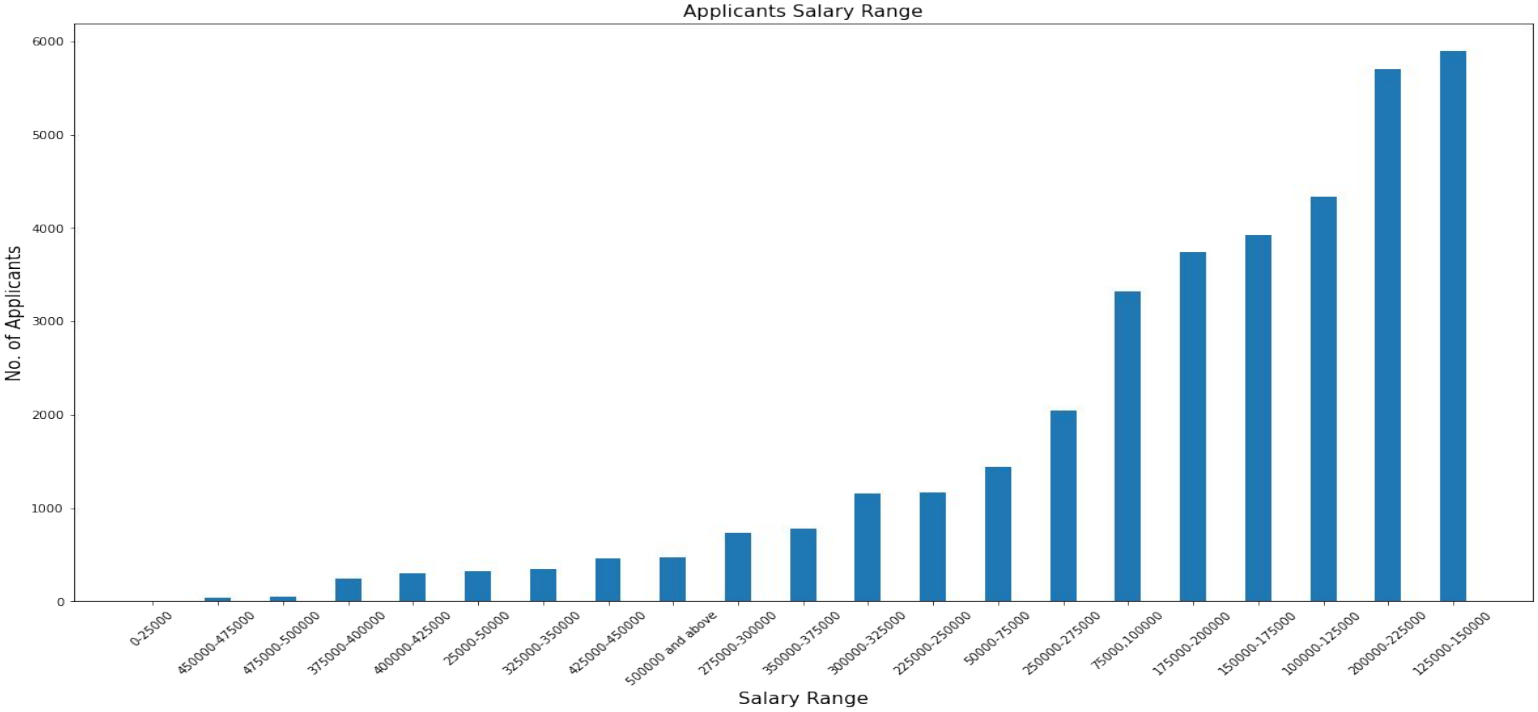


DATASET DEMOGRAPHICS
Applicants Income Type & Occupation





DATASET DEMOGRAPHICS
Applicants Salary Range



MACHINE LEARNING

Data Processing	Clean the data Joins → pgAdmin Merge → Pandas
Features	Random Oversampling SVM Decision Tree Random Forest
Training & Testing Sets	Y value → X value →
Model Choice	?
Accuracy Scores	Training → Testing →

Data Analysis

Logistic Regression

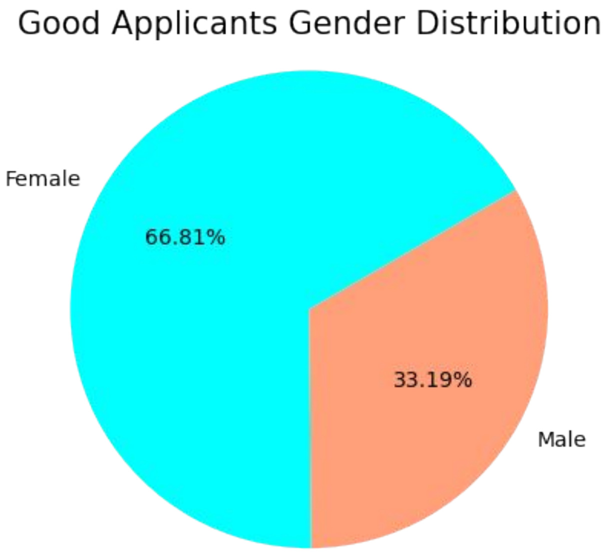
	Predicted High Risk	Predicted Low Risk
Actual High Risk	5068	2011
Actual Low Risk	1379	657

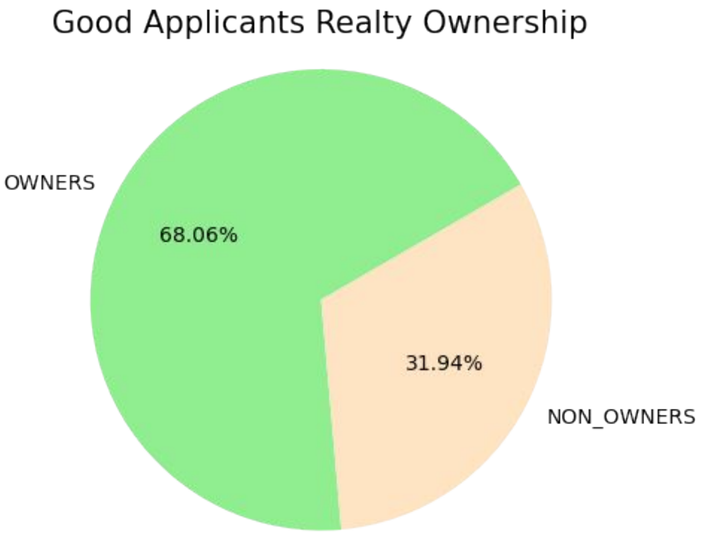
Accuracy Score : 0.5193059398963868

Classification Report

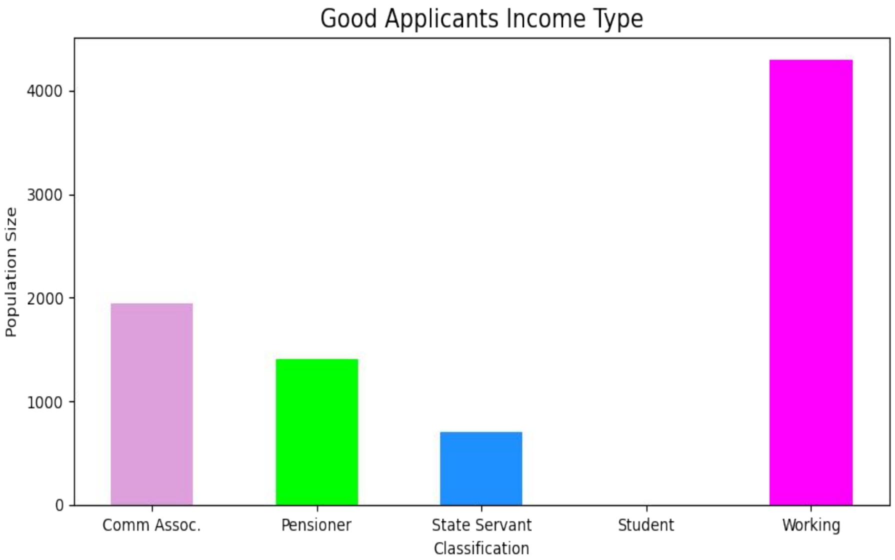
	precision	recall	f1-score	support
0	0.78	0.52	0.63	7079
1	0.23	0.50	0.32	2036
accuracy			0.52	9115
macro avg	0.51	0.51	0.47	9115
weighted avg	0.66	0.52	0.56	9115

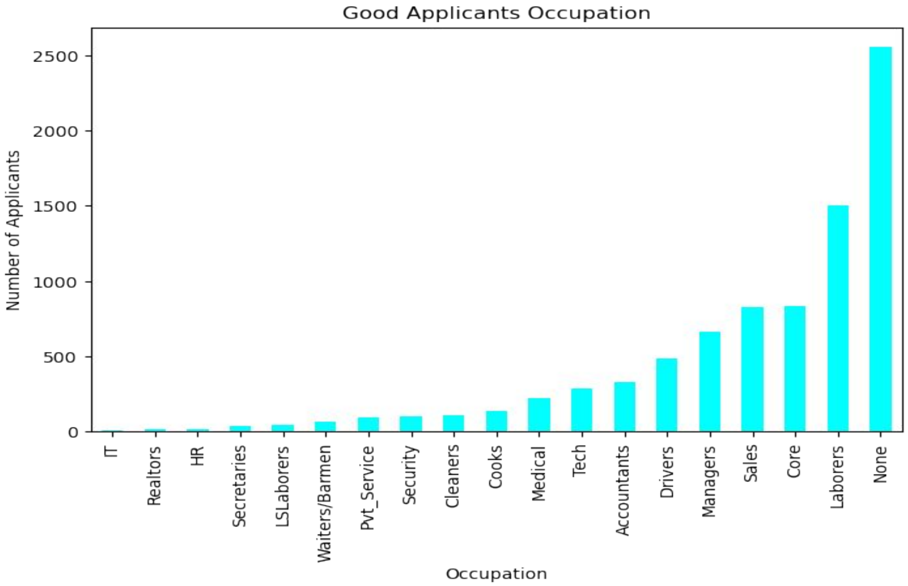
GOOD APPLICANTS DEMOGRAPHICS
Gender Distribution & Realty Ownership





GOOD APPLICANTS DEMOGRAPHICS
Income Type & Occupation

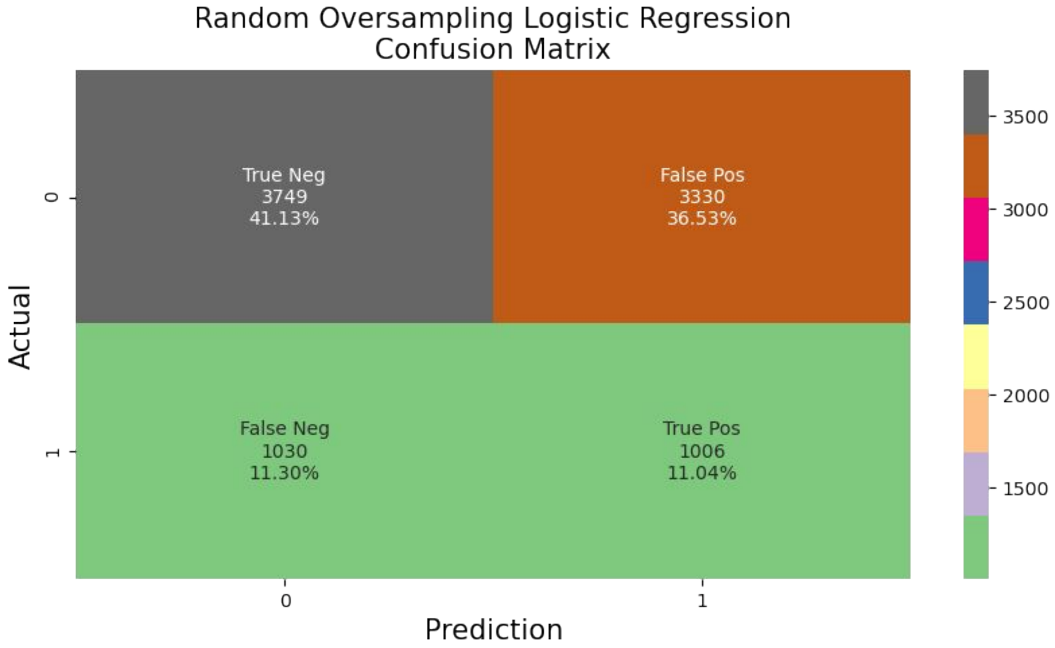




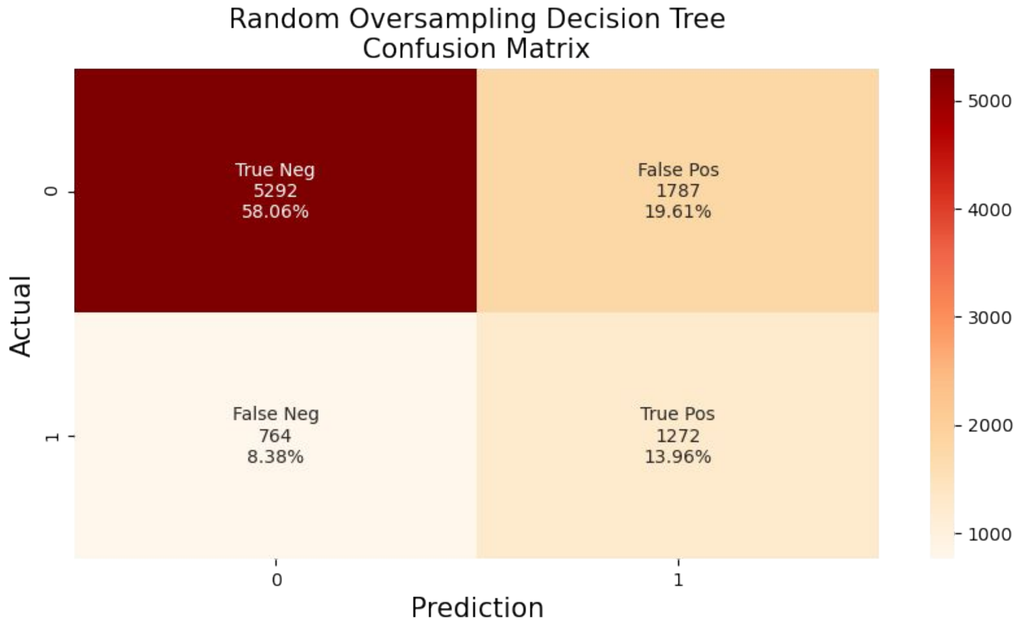
DATABASE

Data Processing	Extract & Transform: Jupyter Notebook, Python, Pandas
Database Setup	AWS RDS, PostgreSQL
Table Joins	Database: pgAdmin

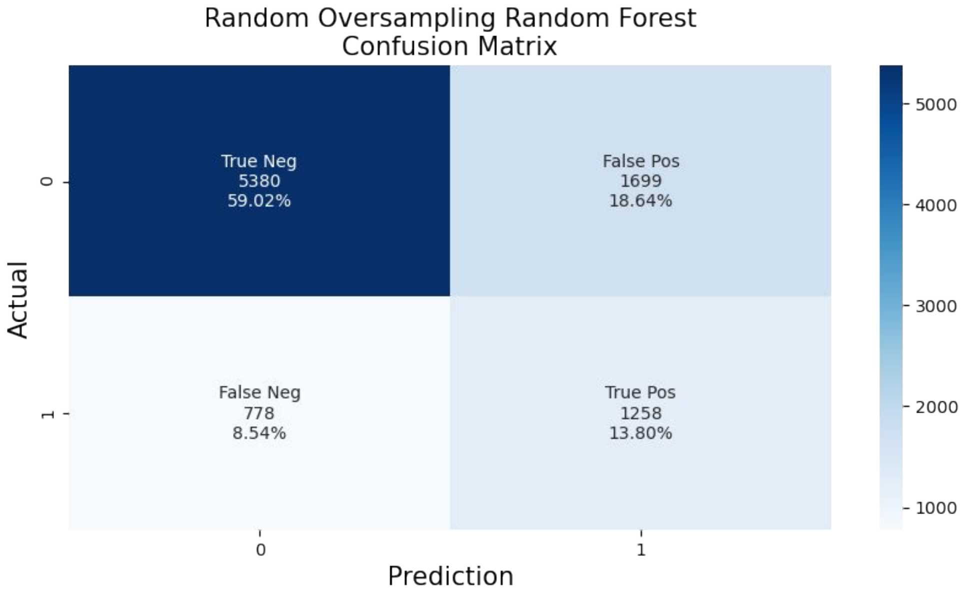
RANDOM OVERSAMPLING CONFUSION MATRIX
Logistic Regression



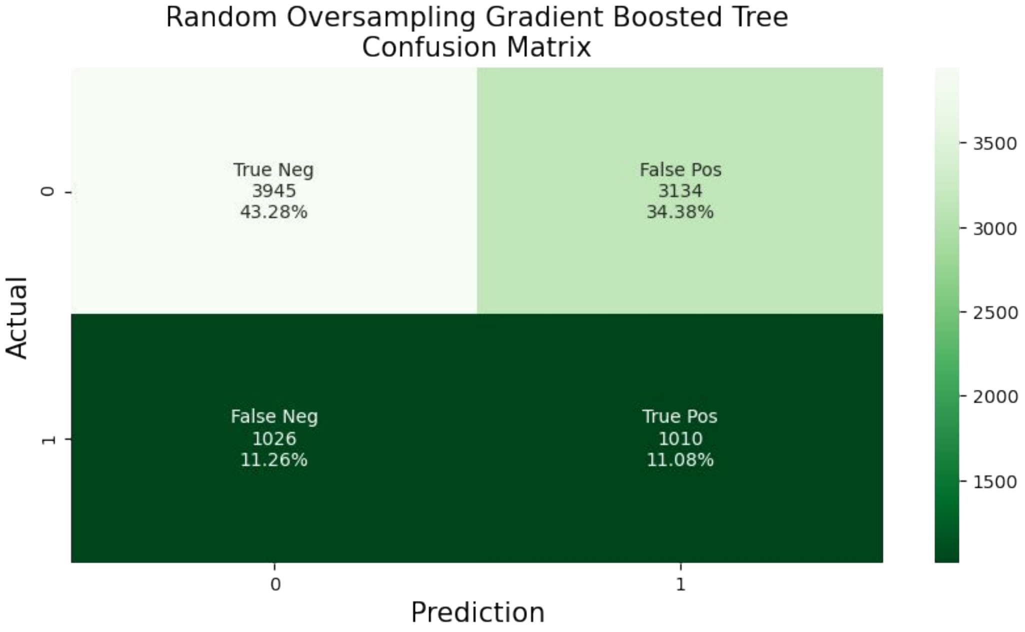
RANDOM OVERSAMPLING CONFUSION MATRIX
Decision Tree



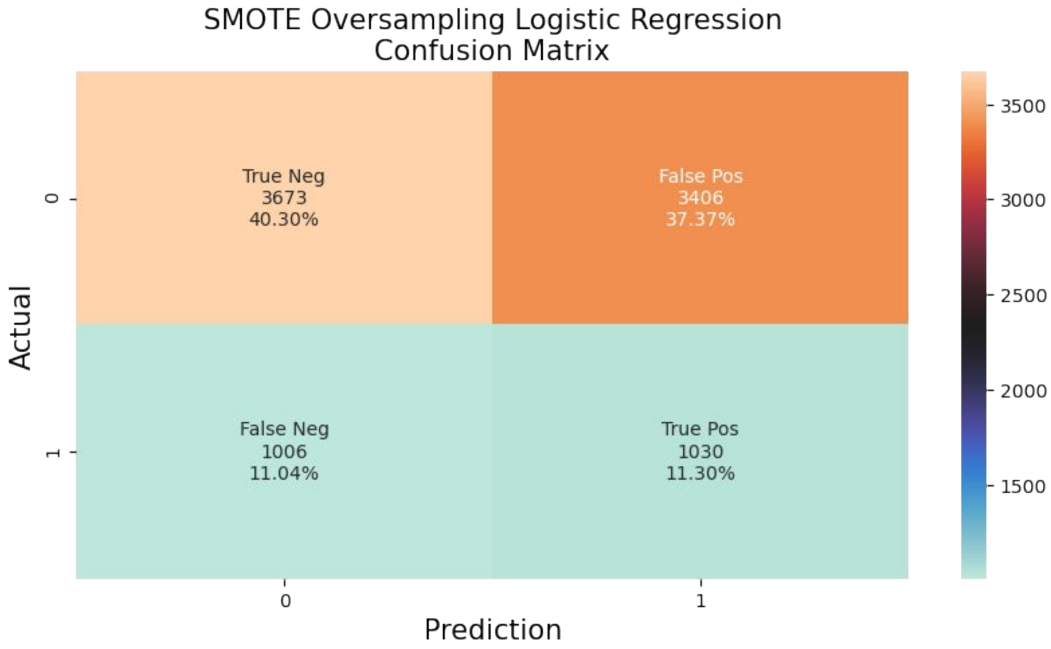
RANDOM OVERSAMPLING CONFUSION MATRIX
Random Forest



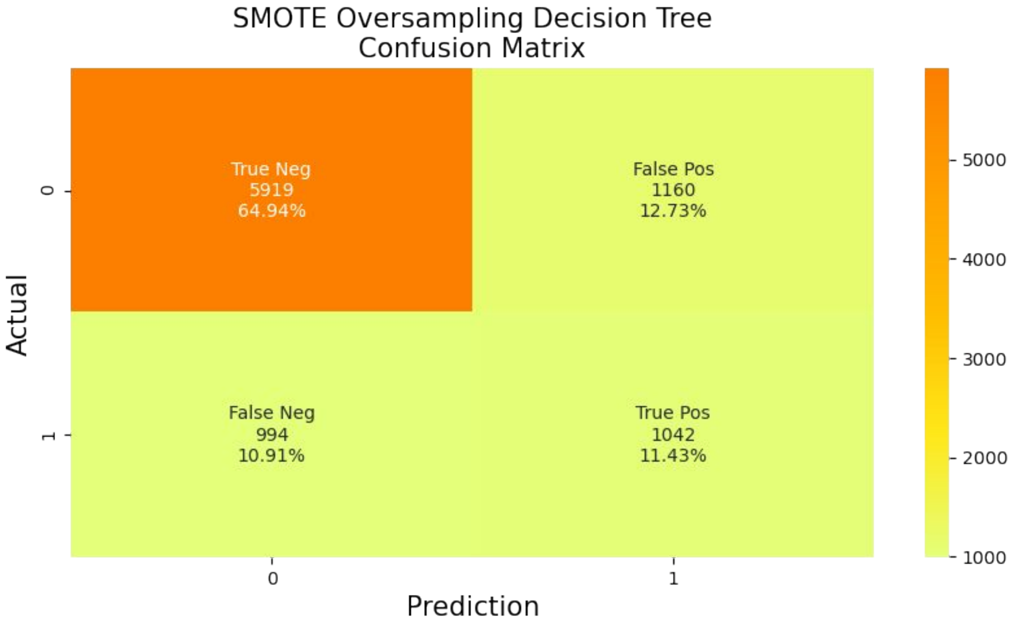
RANDOM OVERSAMPLING CONFUSION MATRIX
Random Forest



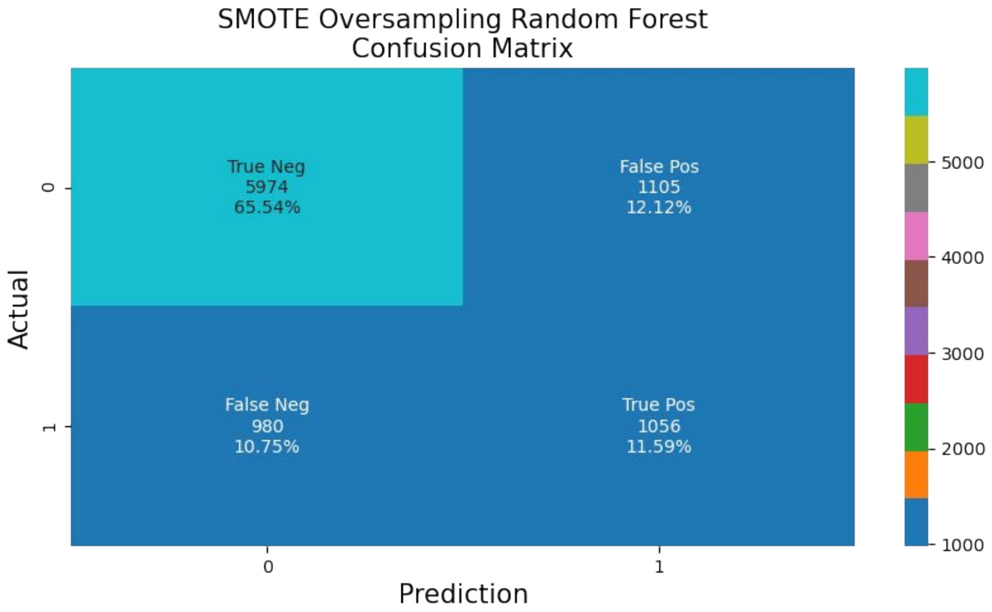
SMOTE OVERSAMPLING CONFUSION MATRIX
Logistic Regression



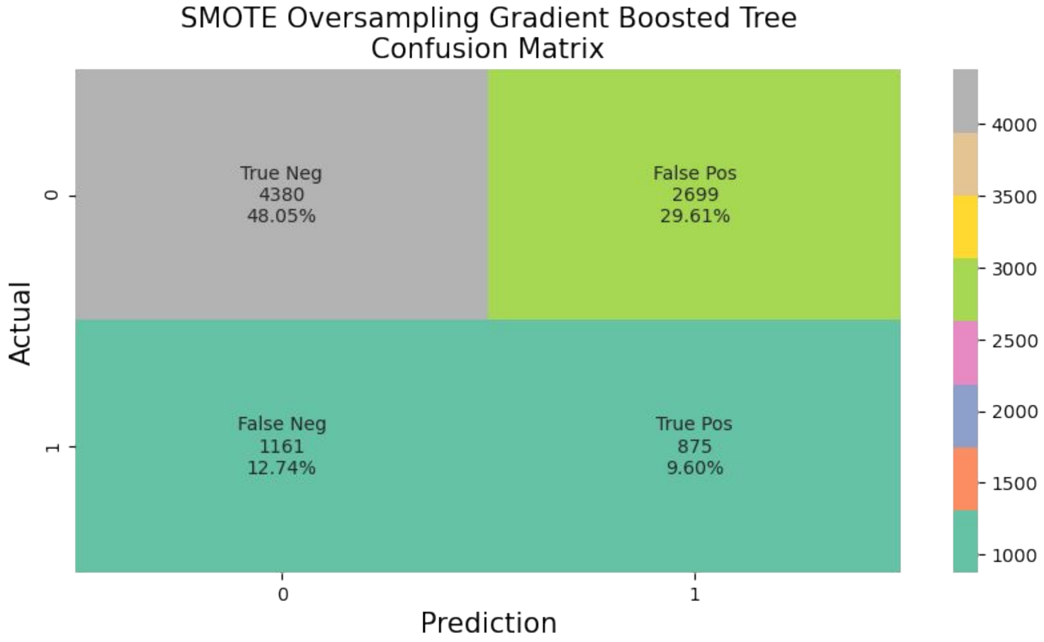
SMOTE OVERSAMPLING CONFUSION MATRIX
Decision Tree



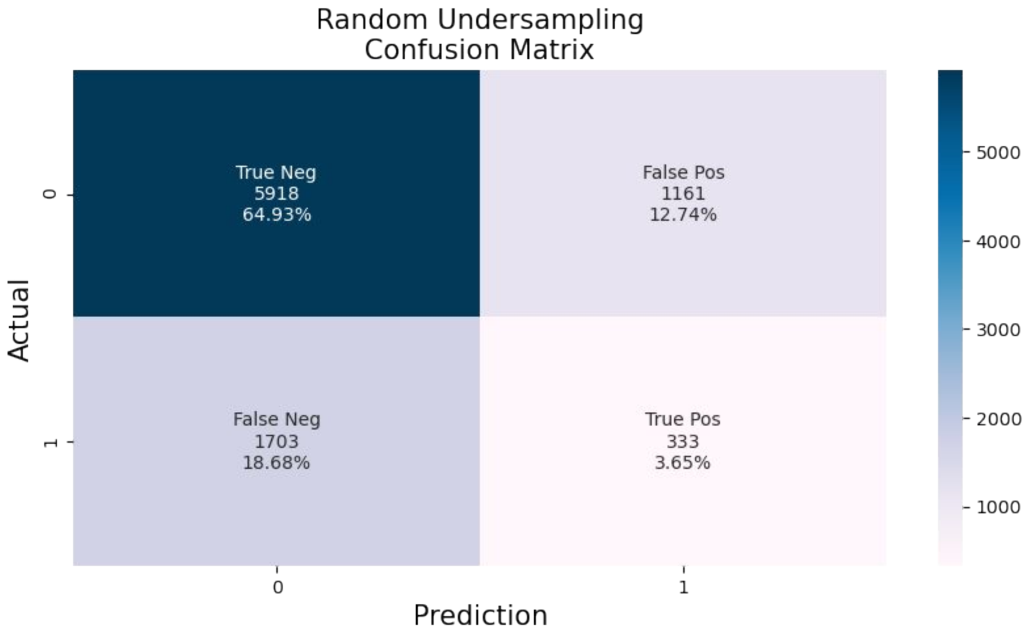
SMOTE OVERSAMPLING CONFUSION MATRIX
Random Forest



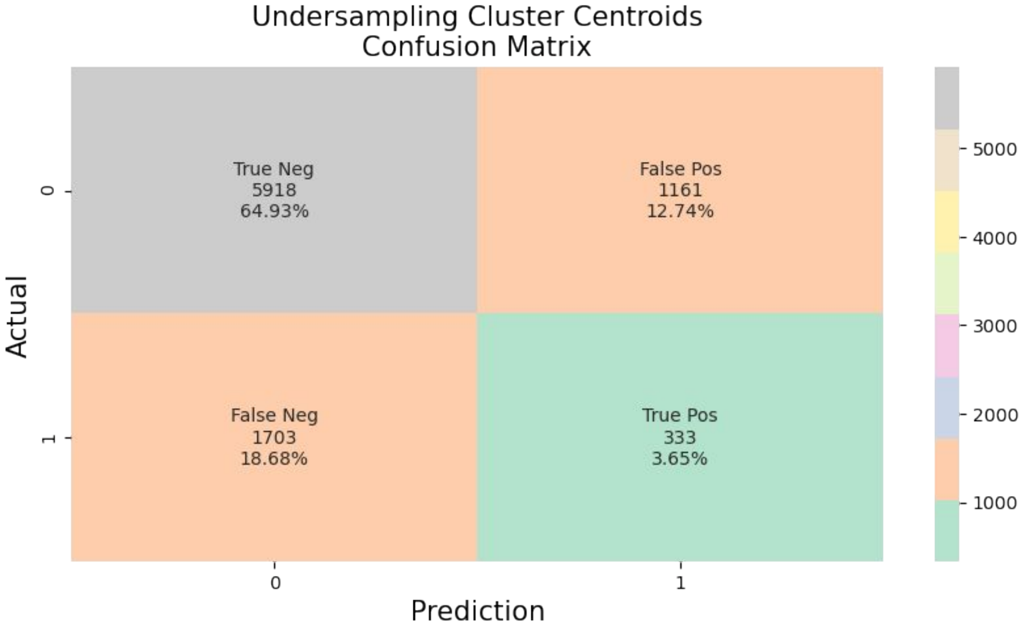
SMOTE OVERSAMPLING CONFUSION MATRIX
Gradient Boosted Tree



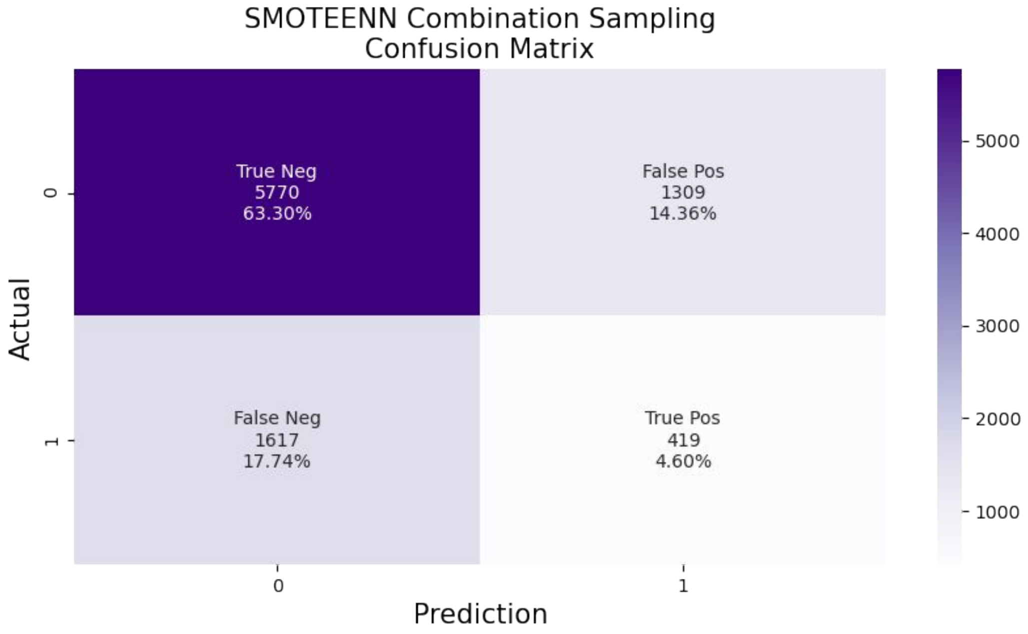
UNDERSAMPLING CONFUSION MATRIX
Random



UNDERSAMPLING CONFUSION MATRIX
Cluster Centroids



COMBINATION SAMPLING CONFUSION MATRIX SMOTEENN

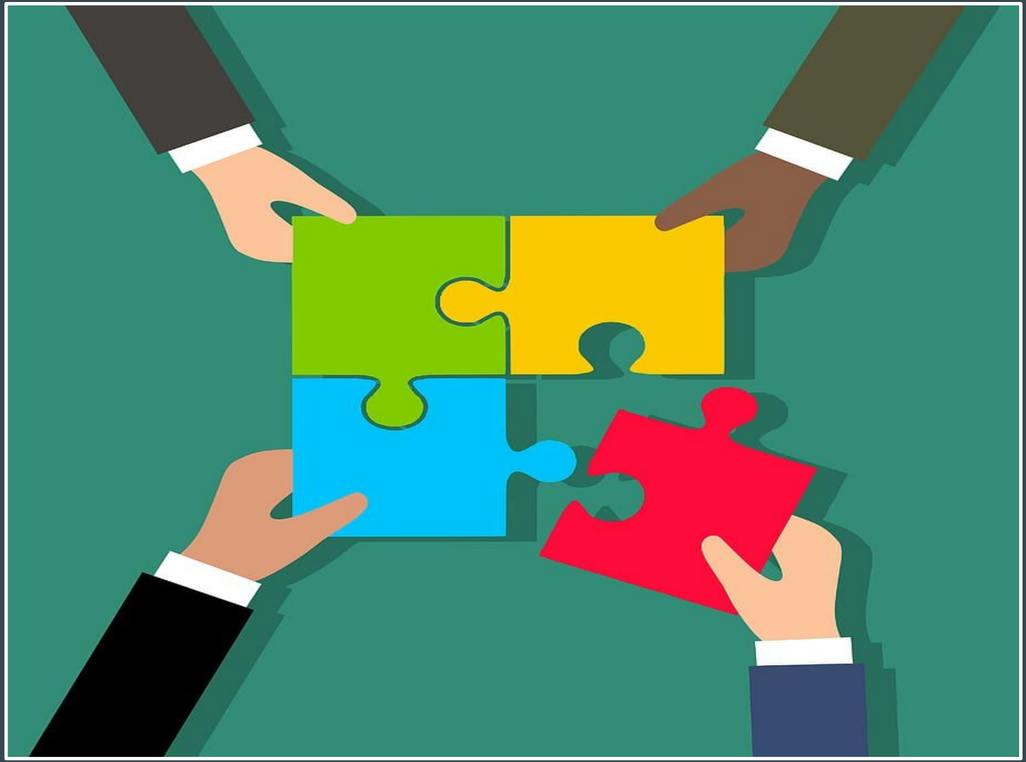


Dashboard Description

Tools: JavaScript, HTML

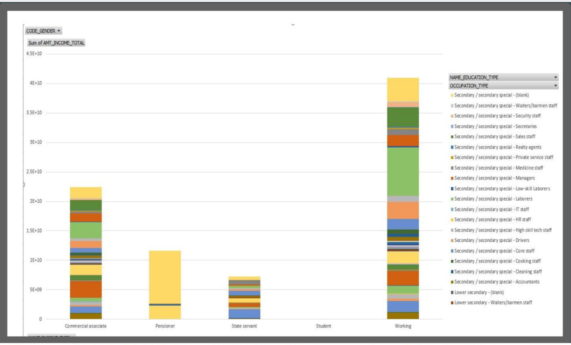
Interactive element(s)Features :

- Age
- Education
- Occupation
- Net income
- Rent



Credit Card Approval Prediction Dashboard

Using personal information and data submitted by credit card applicants,
the model will predict the probability of future defaults and credit card borrowings.



Approve or not?

The objective of this project is to help a financial institution to decide whether to issue a credit card to an applicant. Using personal information and data submitted by credit card applicants, the model will predict the probability of future defaults and credit card borrowings.

Filter Search

Enter Date

1/10/2010

Enter City

Toronto

Enter State

ON

Enter coutry

Canada

Enter a Shape

cicle

id [PK] character varying (10)	code_gender character varying (2)	flag_own_car character varying (2)	flag_own_realty character varying (2)	cnt_children integer	amt_income_total real	name_income_type character varying (40)	name_education_type character varying (40)	name_family_status character varying (40)
5008805	M	Y	Y	0	4.275	Working	Higher education	Civil marriage
5008806	M	Y	Y	0	1.125	Working	Secondary / secondary spec...	Married
5008808	F	N	Y	0	2.7	Commercial associate	Secondary / secondary spec...	Single / not married
5008809	F	N	Y	0	2.7	Commercial associate	Secondary / secondary spec...	Single / not married
5008810	F	N	Y	0	2.7	Commercial associate	Secondary / secondary spec...	Single / not married
5008811	F	N	Y	0	2.7	Commercial associate	Secondary / secondary spec...	Single / not married
5008812	F	N	Y	0	2.835	Pensioner	Higher education	Separated
5008813	F	N	Y	0	2.835	Pensioner	Higher education	Separated
5008814	F	N	Y	0	2.835	Pensioner	Higher education	Separated
5008815	M	Y	Y	0	2.7	Working	Higher education	Married
5112956	M	Y	Y	0	2.7	Working	Higher education	Married
5008819	M	Y	Y	0	1.35	Commercial associate	Secondary / secondary spec...	Married
5008820	M	Y	Y	0	1.35	Commercial associate	Secondary / secondary spec...	Married
5008821	M	Y	Y	0	1.35	Commercial associate	Secondary / secondary spec...	Married
5008822	M	Y	Y	0	1.35	Commercial associate	Secondary / secondary spec...	Married
5008823	M	Y	Y	0	1.35	Commercial associate	Secondary / secondary spec...	Married

WHAT WOULD WE DO DIFFERENTLY?

The Team

Binoy Luckoo

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Samir Rifi

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Jane Huang

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Lucas Chandra

Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum

QUESTIONS

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CITATIONS

Slide 1 Background picture:
https://wowplus.net/these-are-the-new-upcoming-changes-to-your-credit-score-and-credit-cards/ (sept,2021)
Slide 2 pictures:
https://godmen.org/2021/02/20/best-credit-card-offers-what-are-the-best-offers/ (sept,2021)
Data:
https://www.kaggle.com/rikdifos/credit-card-approval-prediction