

CAROLINA DATA CHALLENGE CONCLUSION REPORT

SUMMARY

The two classification models used along with their accuracy are :

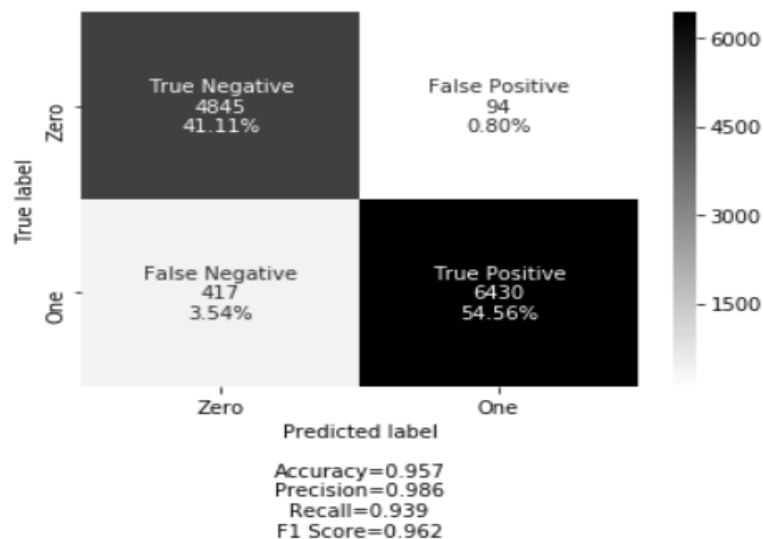
- Multi- Layer Perceptron Classifier (ANN Model) with 76% accuracy.
- Support Vector Classifier with 96% accuracy.
- Reduced Support Vector Classifier with significant parameters with 95% accuracy.

The significant parameters along with their correlation values to action_taken is:

Parameter (Independent Variable)	Pearson Correlation Value
lei (Bank Name)	0.15
derived_race	0.11
income	0.10
loan_amount	0.34
loan_type	0.10
hoepa_status	-0.89
debt_to_ratio	-0.18
applicant_credit_score_type	0.17
Applicant_age	-0.12

The positive values show a positive trend with the loan approval rate and negative values show a negative trend with the loan approval rate and these are the most significant values considered in reducing the SVC model.

The confusion matrix attributes are stated below:



The False Positive rate is less which highlights the fact that wrong loan approval decision is predicted the least with this model and hence a high precision if a person will get a loan or not can be predicted with this model in the three banks under consideration.

KEY FINDINGS:

- SVC Model showcased a better predictability than MLP Classifier model for this dataset.
- Joint account types got the maximum loan amount compared to individual accounts.
- Male Individual accounts got a higher loan amount and are more likely to have an individual mortgage than Female Individual accounts.
- Applicant age is a significant variable and people with ages between (35 years – 54) years had the maximum loan amount and people with ages less than 25 and greater than 74 had applications for least loan amounts.
- White race is the one that have the highest Conforming Loans compared to Black Americans and Asians.
- White race gets the highest loan approvals and preapprovals with large loan amounts compared to Black Americans and Asians. Whites are followed by Black Americans which in turn are followed by Asians.
- Based on Ethnicity, Non- Hispanic receive high loan amounts.
- Black Americans have a low loan approval rate compared to White Race. Asians have a greater loan approval rate compared to Black Americans
- White People have a very large and high income for the state of North Carolina compared to Black Americans and Asians.
- Wells Fargo Bank processed the maximum loan applications for both years 2018-2019 compared to Bank of America and PNC Bank. Wells Fargo Bank was followed by Bank of America and PNC got the least applications.
- There was a significant drop in the number of applications in year 2019 for Bank of America compared to Well Fargo Bank, which saw an increase in the number of applications and gave larger loan amount.