**The classification goal is to predict the likelihood of a liability customer buying personal loans.**

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1. INTRODUCTION

This is about a bank which has a growing customer base. The bank wants to increase borrowers (asset customers) base to bring in more loan business and earn more through the interest on loans. So , the bank wants to convert the liability based customers to personal loan customers (while retaining them as depositors).

A campaign that the bank ran last year for liability customers showed a healthy conversion rate of over 9% success. Now the department wants us to build a model that will help the bank identify the potential customers who have a higher probability of purchasing the loan.

This will increase the success ratio while at the same time also reduces the cost of the campaign.

2. PROBLEM STATEMENT

The main aim of this model is to predicting the way to explore ways of converting its liability customers (depositors) to personal loan customers (while retaining them as depositors) using some continous and discrete variable data.

Finding relationship or dependency of Personal Loan on attrubutes like Income, Age ,Experience etc.

3. PYTHON LIBRARIES

* Numpy
* Pandas
* Matplotlib
* Seaborn
* Scikit-Learn

4. Independent and dependent variable

* Independent variable

Independent variable (X) = Feature variable = Predictor variable

The following are the independent variable:-

1. ID : Customer ID
2. Age : Customer's age in completed years
3. Experience : years of professional experience
4. Income : Annual income of the customer ( 000)
5. ZIPCode:HomeAddressZIPcode.
6. Family:Familysizeofthecustomer
7. CCAvgAvg.:spendingoncreditcardspermonth( 000)
8. Education : Education Level. 1: Undergrad; 2: Graduate; 3: Advanced/Professional
9. Mortgage : Value of house mortgage if any. ($000)
10. Securities Account : Does the customer have a securities account with the bank?
11. CD Account : Does the customer have a certificate of deposit (CD) account with the bank?
12. Online : Does the customer use internet banking facilities?
13. CreditCard :Does the customer use a credit card issued by UniversalBank?

* Dependent variable

Dependent variable (y) = Target variable = Response variable

The following is the dependent variable:-

Personal Loan :Did this customer accept the personal loan offered in the last campaign?

5. CLASSIFICATION ALGORITHMS USED

Logistic Regression

Support Vector Machine (SVM)

Random Forest Classifier

Decision Tree

6. INTERPRETATION

* Logistic Regression

Training Accuracy: 0.95

Testing Accuracy: 0.96

Precision: 0.89

Recall: 0.63

* Support Vector Machine (SVM)

Training Accuracy : 0.9523

Testing Accuracy : 0.9540

Precision: 0.8761904761904762

Recall: 0.6216216216216216

* Random Forest Classifier

Training Accuracy: 0.99

Testing Accuracy: 0.99

Precision: 0.98

Recall: 0.92

* Decision Tree

Training Accuracy : 0.9980

Testing Accuracy : 0.9767

Precision: 0.9051094890510949

Recall: 0.8493150684931506

7. CONCLUSION

We have implemented 5 classifier models.

From the above implemented classifiers RandomForestClassifier is the best model to predict ikelihood of a liability customer buying personal loans with 99% training and testing accuracy.