BM 655: Essential AI for Managers

Case Study 2: Building a Classifier to Calculate default Probability

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Overview: In this case study we are going to build a classifier to calculate the probability of a customer defaulting their credit card bills.

Problem Statement: Zen Bank a private financial institution is wary of their credit card customers basis the Covid-19 situation and wants to know the probability of a customer defaulting their credit card bills.

Requirement: You are required to build a classifier to calculate the probability of a customer defaulting their credit card bills.

Dataset:

Dataset name: credit-default.csv

Dataset Description: Each row is about a customer. We have details about their savings, employment, age, marital status etc. In default column (target column), we have value 1, if the customer has not defaulted and the value 2, if the customer has defaulted.

Approach: Your activities towards the problem statement would involve:

1. In the target column, replace 1 with 0 and 2 with 1. So that the defaulters will become positive class.
2. Summarize the dataset using various summarization techniques
3. Identify whether the target column is balanced or imbalanced. Plot the same using a simple pie chart.
4. Perform exploratory data analysis to identify which factors differentiate/influences customers who are defaulting with others.
5. Convert all categorical columns to numerical columns using one hot encoding (i.e. using dummy variables technique).
6. Divide the dataset in to training (80%) and testing (20%). (Use random_ state=1)
7. Use the Logistic Regression to build a classifier. Make sure that you include only those variables which are significant (use trial and error method for the same).
8. Obtain the classification report.

Conclusion: For an input customer details, the model should make predictions with value 1, if the customer has not defaulted and the value 2, if the customer has defaulted.