

## About MONEYMAX

MoneyMax Leasing represents MoneyMax Financial Services Ltd's foray into the auto-financing industry. As a convenient one-stop automotive financing hub in Singapore, MoneyMax Leasing offers a suite of financing plans with easy repayment options, including COE renewal financing and car insurance.



## Problem Statement

MoneyMax's credit assessment process primarily relies on 3 factors: value of collateral, character of the hirer and capacity of the hirer to repay the loan

However, this limited set of variables may be inadequate in identifying potential defaulters.

To address this challenge, our group will be conducting the following analysis:

1. Analyse and find common characteristics among hirers who default on car loans. This analysis could include identifying specific types of vehicles, hirer's salary range, occupations, age groups and business industries with a higher likelihood of default.
2. To research possible non-traditional credit factors that are related to creditworthiness.

## Our Process

**Data Scraping:** We created an Excel scraper and a PDF scraper to efficiently collate all the necessary data from the provided Excel and PDF files into a single Excel master file.

**Data Cleaning and Processing:** Using Excel functions, we dropped duplicate data, derived new variables from the current set of variables as well as integer encoded categorical variables.

**SMOTE:** Due to the low default rate, this may negatively impact our subsequent models' ability to identify potential defaulters. SMOTE is used to resolve the imbalanced dataset issue.

**Model Development:** We developed a logistic regression model and two classification trees.

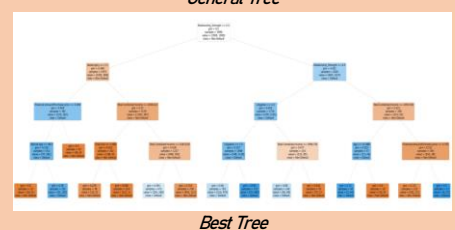
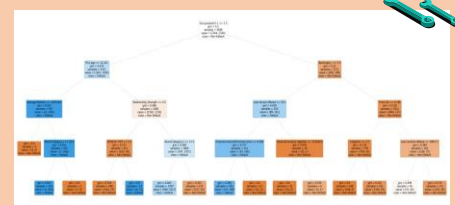
## Solution 1: Logistic Regression

Using Python and LASSO in R, we highlighted statistically significant variables which MoneyMax can continue collecting during their hirer application process as well as new variables to consider collecting moving forward.

TOP 10 STATISTICALLY SIGNIFICANT VARIABLES	IMPACT ON PROBABILITY OF DEFAULT
1. Relationship Strength	+
2. Loan Amount Offered	-
3. Hire LSA	-
4. Car Brand (Category)	-
5. Combined monthly income of hirers and guarantors	+
6. Commission Based/ Self-Employed	+
7. Car Brand (Country)	-
8. Length of Service	-
9. No. of years between hiree litigation date and application date	-
10. Hire LSA	-

## Solution 2: Classification Trees

Using Spyder, we developed two classification trees to help predict the defaulters. From the General Tree and the Best Tree rules, we presented different potential defaulter personas.



For example, Defaulter 1 is in Age Group 2, earns a monthly salary amount equivalent to those in Salary Group 3 and their car is Brand 2. This allows MoneyMax to zoom in on hirers with similar traits as Defaulter 1 to either reject the hirer application, offer a lower loan amount or request the hirer to apply with a guarantor.



## Group Reflection

By far, this was the most intensive and interesting project we have undertaken at SMU. To ensure that our final deliverables are up to our client's expectations, we had weekly meetings where we allocated tasks and updated one another on our progress. If there were any problems encountered, we would immediately address them and consult our professors. This ensures that our progress is not backlogged. Overall, we gained valuable hard and soft skills, such as data scraping, cleaning and model development as well as efficient communication and teamwork. We strongly believe these skills will aid in furthering our future professional and personal growth.

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