



Home Credit Score Card Model

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Problem Research

PROJECT BACKGROUND

Many people struggle to get loans due to insufficient or non-existent credit histories. Home Credit strives to broaden financial inclusion for the unbanked population by providing a positive and safe borrowing experience. In order to make sure this underserved population has a positive loan experience. Home Credit makes use of a variety of alternative data to predict their clients' repayment abilities. Doing so will ensure that clients capable of repayment are not rejected and that loans are given with a principal, maturity, and repayment calendar that will empower their clients to be successful

DATA SOURCE

The data used are **application train** and **application test**. There are our main table, broken into two files for train (with TARGET) and test (without TARGET).

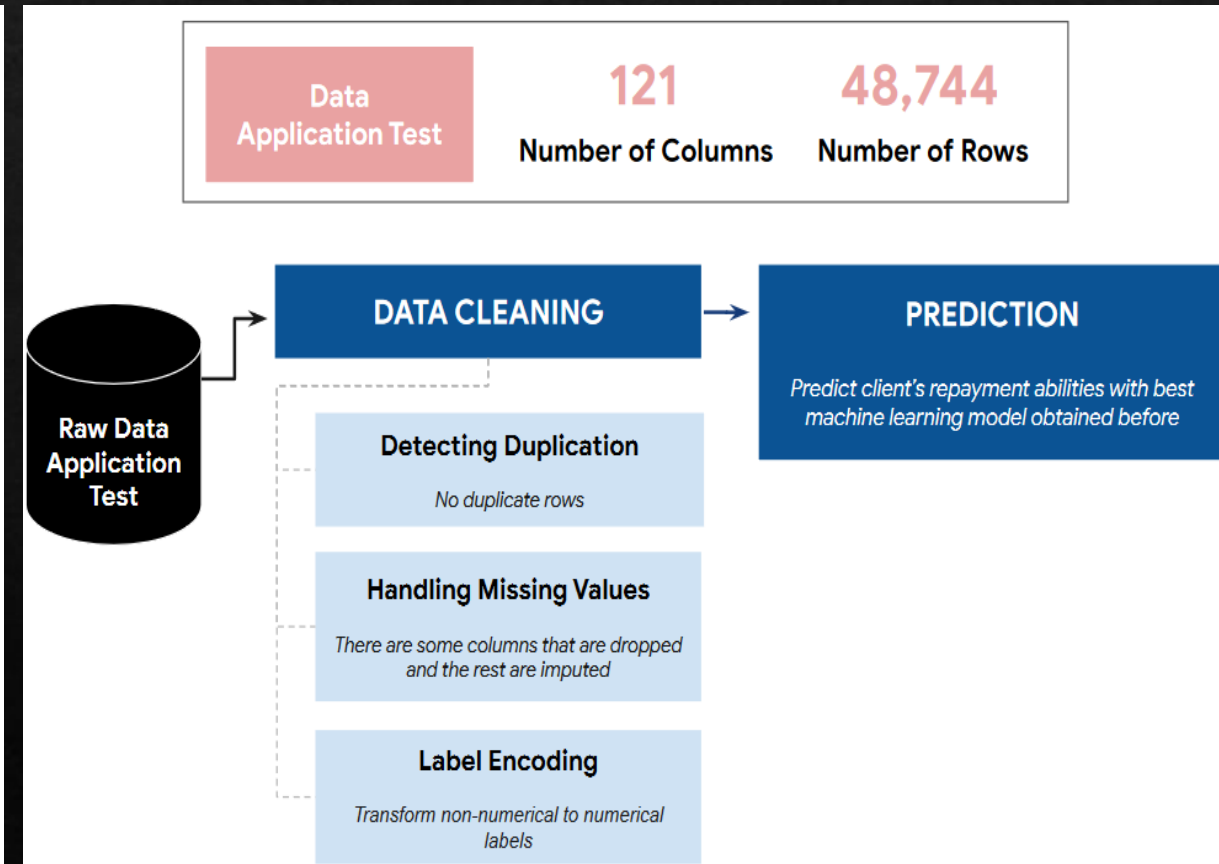
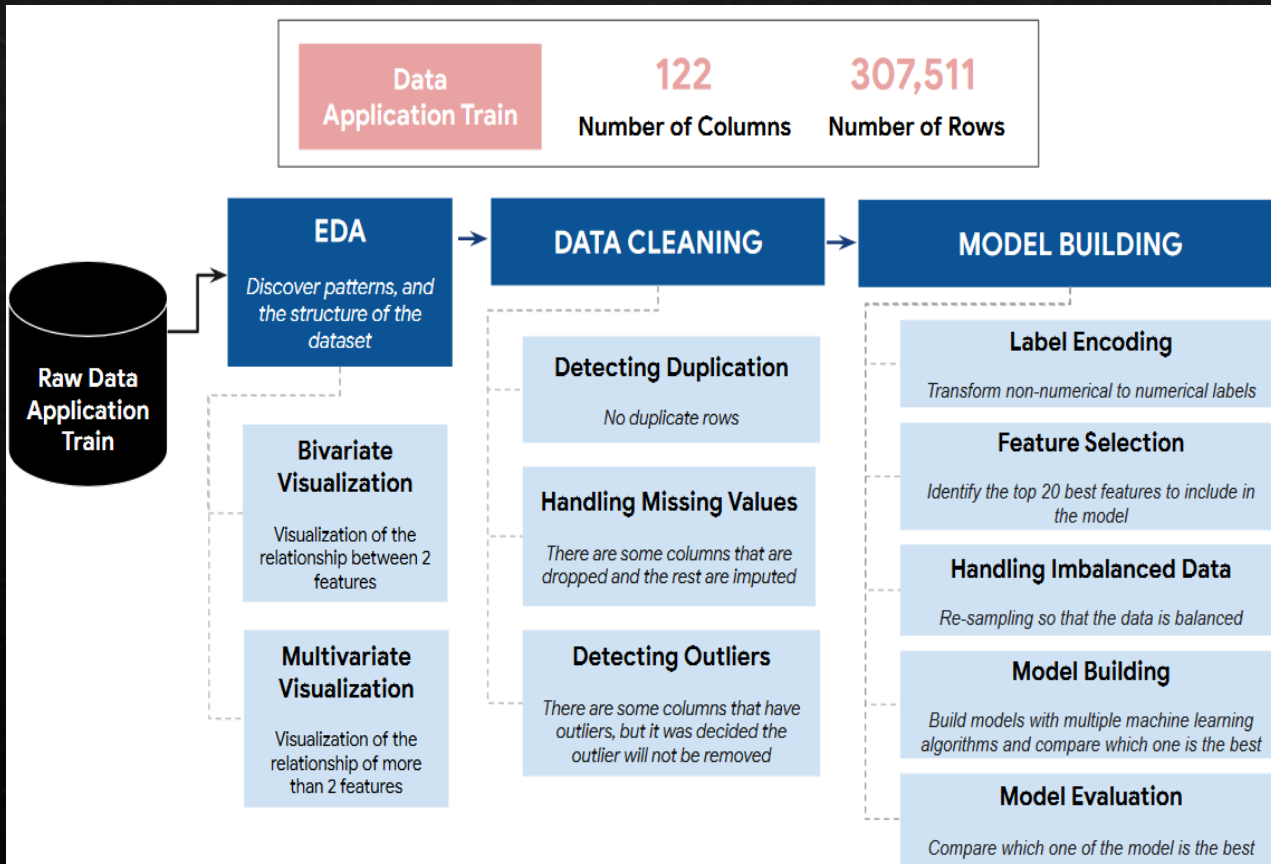
OBJECTIVE

1. **Identify** characteristics of potential clients who will have difficulty repaying loans and who will not.
2. **Predict** client's repayment abilities.

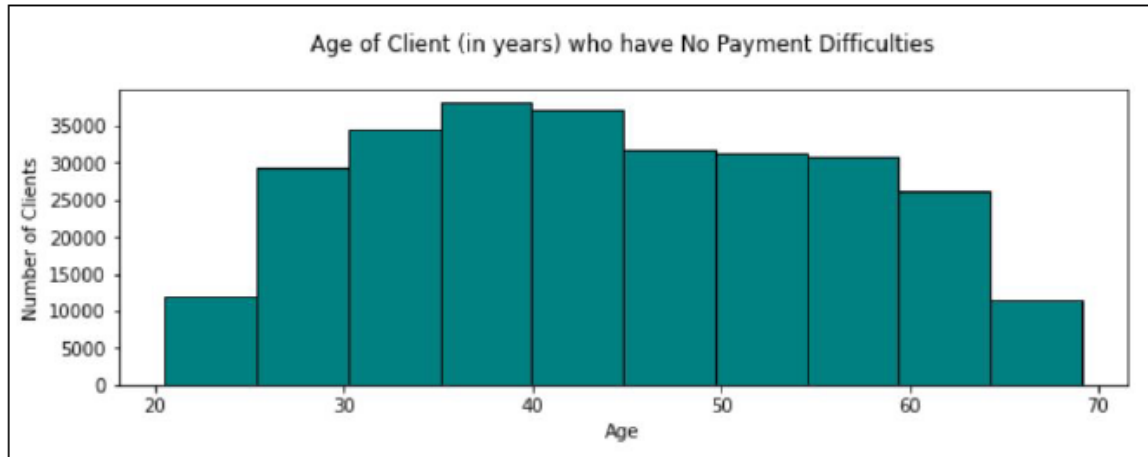
ACTIONS

1. Perform **data cleaning**, and **visualization** for business insights.
2. **Build a models** with machine learning algorithms.
3. Provide **recommendations** for company to increase their clients succeed in applying for loans.

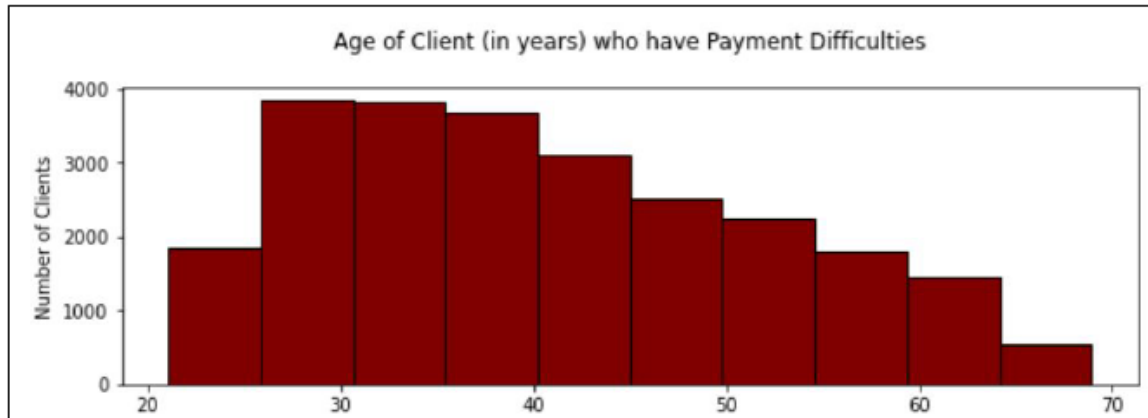
Data Preprocessing



Business Insight

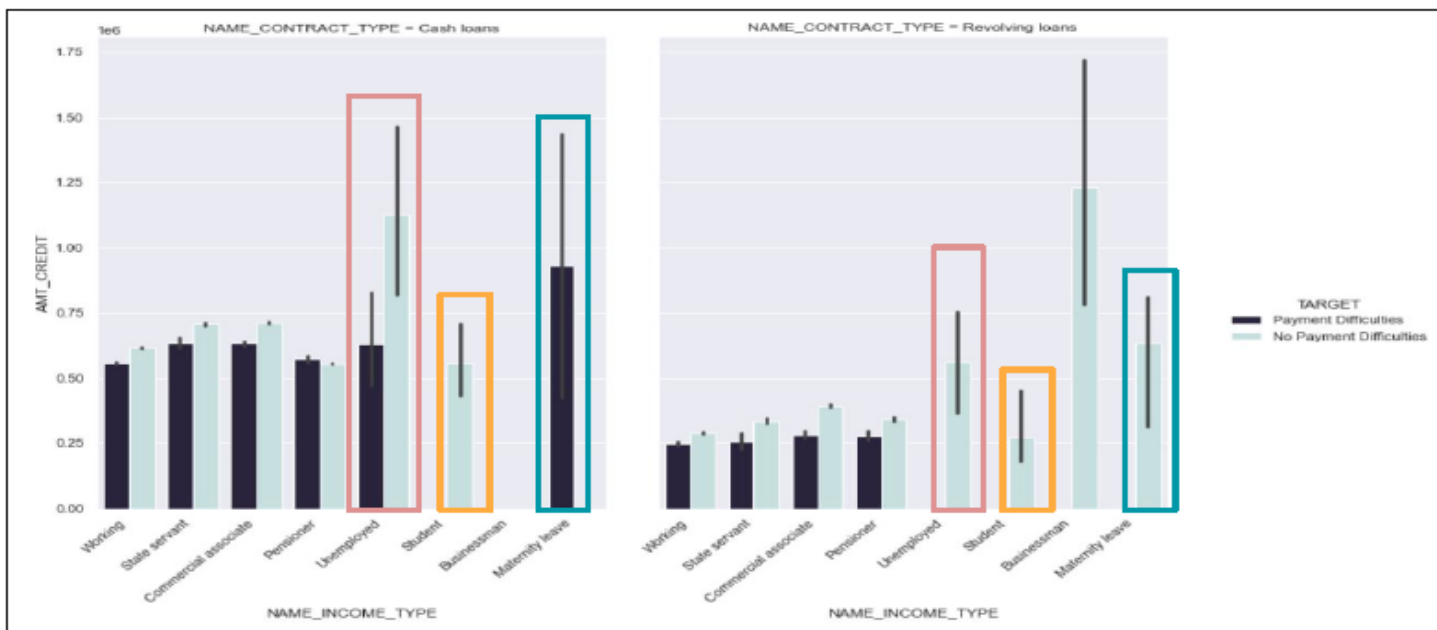


- Most number of clients who apply for loans are in the range of 35-40 years.
- Meanwhile, the number of applicants for clients aged <25 or age >65 is very low.



- Clients who have **no payment difficulties** are clients in the range of **35-45** years. You can target these clients as your priority.
- While clients who **have payment difficulties** are client the range of **25-35** years.

Business Insight



All student clients have no difficulty repaying the loans whether with cash loan or revolving loan for a low to medium credit amount of the loan.

For the income type of maternity leave with cash loans, all the clients have problems repaying the loans for a medium credit amount of the loan. While all clients with maternity leaves and revolving loans have no difficulty repaying the loans.

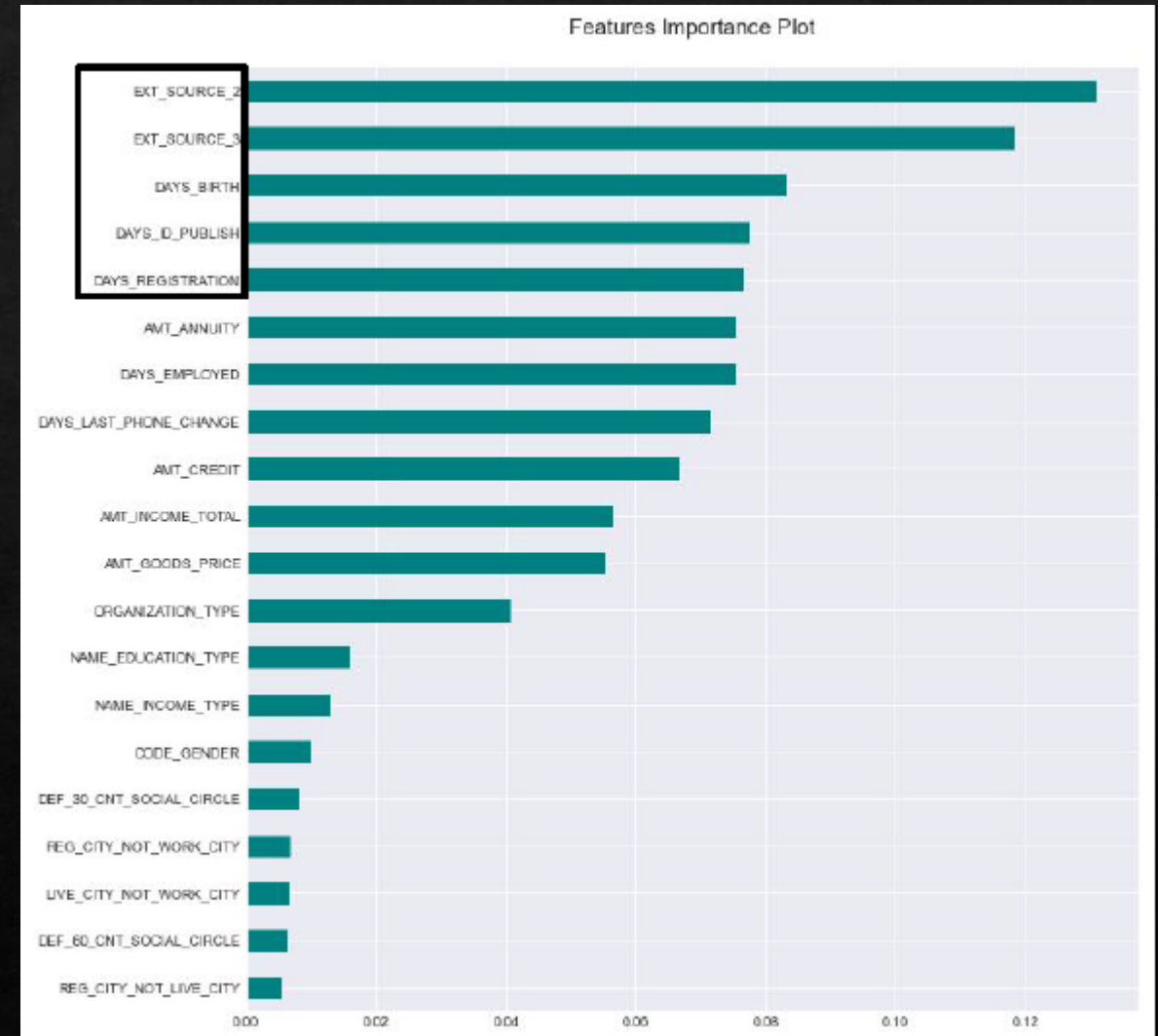
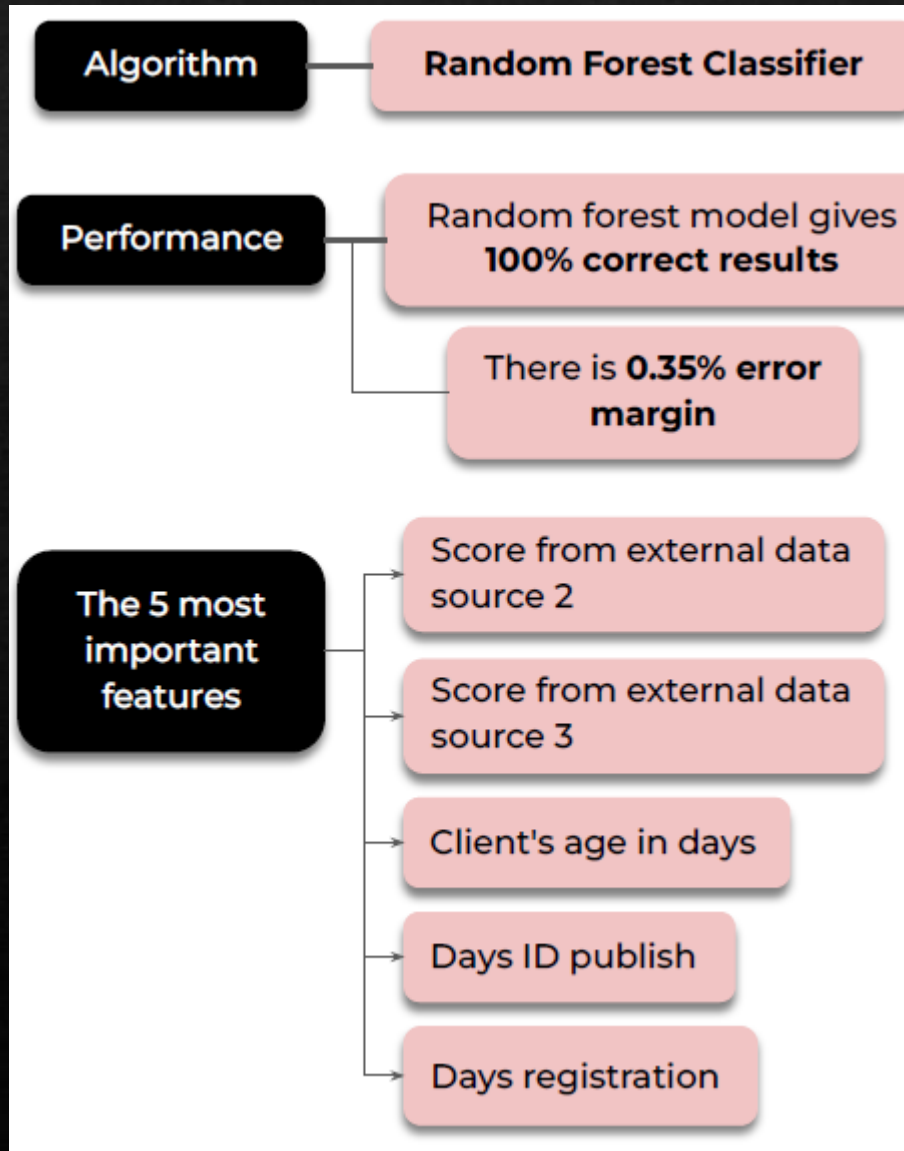
For unemployed clients with cash loans, more than 50% of clients have problems repaying loans with medium credit amounts of the loan. While all unemployed clients with revolving loans have no difficulty repaying the loan.

Model Comparison

Algorithm	Training Accuracy Score	Testing Accuracy Score	Error Margin	ROC Score
Logistic Regression	67.16%	67.29%	0.13%	0.6728
Gaussian Naive Bayes	60.24%	60.39%	0.15%	0.604
Decision Tree	100%	83.9%	11.74%	0.8826
Random Forest	100%	99.65%	0.35%	0.9965
K-Nearest Neighbor	91.56%	88.07%	3.79%	0.8806
Neural Network	70.01%	69.48%	0.58%	0.6948

The prediction accuracy of the train and test data in **Random Forest** model has a value that is not much different, it can be said that the model is very good, which is there is **no underfitting or overfitting**. So the **Random Forest** model was chosen as the **best model to predict client's repayment abilities**.

Best Model



Business Recommendation

- ◆ A client with an income type of **student** can be said to be a client who is **capable of repaying the loans** whether with a cash loan or revolving loan (100% of applications approved). But there only 0.005% of applications come from the student.
- ◆ A client who works as an **accountant** can be said to be a client who is **capable of repaying the loans** (95% of applications approved). But, there is only 3.19% of applications come from an accountant. So do, the client who work as **high skill tech staff** and **manager**, they are capable of repaying the loans, but there are only a few applications that come from them
- ◆ Recommendation :
Create a campaign so that more student, accountant, high skill tech staff, manager interested in applying for a loan

Business Recommendation

- ◆ Clients with **maternity leaves** and **cash loans** can be said to be a client who is **incapable of repaying the loan** (100% of applications rejected). On the contrary, all clients with maternity leave but taking revolving loans to have their applications approved.
- ◆ For **unemployed** clients, more than 50% of them **have a problem repaying their loans** if they take **cash loan** contracts. Meanwhile, all unemployed client who takes revolving loans is capable of repaying the loan.
- ◆ **Recommendation :**
Need further analysis, you can **survey** to find out if there is a problem if a client with maternity leaves or unemployed takes a cash loans contract. So, in the future, if there are clients with that type of income, you **can recommend the right contract type** so that their applications will be approved

Thank you

Github Repo : <https://github.com/EkoriantoChan/Home-Crredit-Score-Card-Model/>