Enhancing the Loan Approval Process

Predictive Modeling for Home Credit Default Risk Loan Approvals

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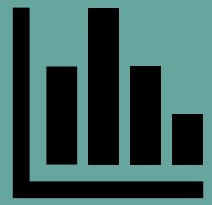
Presentation Agenda



1. Predictive Modeling Goals
2. Data Information/Feature Selection
3. Model Fitting
4. Final Models
5. Ethical Considerations

Predictive Modeling Goals

Build	Build a predictive model for assessing ability to pay back a loan
Provide	Provide a comprehensive evaluation of various model types
Offer	Offer actionable insights and provide a tool to enhance loan approvals

Data Information

Kaggle: application_train

- *Main dataset*

Kaggle: bureau

- *Past credits clients have in credit bureau*

Kaggle: previous_application

- *Past applications for home credit loans*

Data Sample

TARGET	WEEKDAY_APPR_PROCESS_START	HOUR_APPR_PROCESS_START	...	COLLEGE_FLAG	PREV_APPS	APPROVAL
1	Wednesday	10	...	0	1	Approved
0	Monday	11	...	1	3	Approved
0	Monday	9	...	0	1	Approved

Feature Selection

Applicant Education/Work

Applicant Personal Information

Loan Application Information

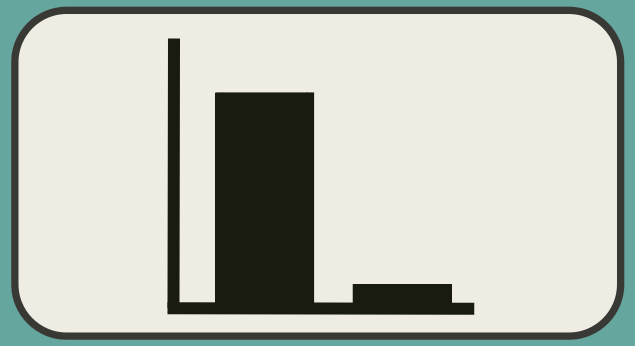
Applicant Loan History

Hand-Picked Features

All Filtered Features

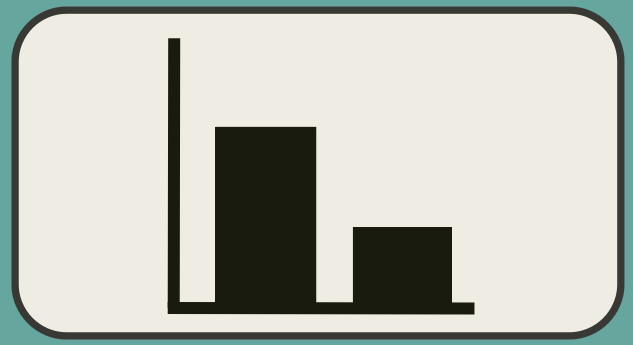
Addressing Data Imbalance

Challenge



Approximately 8% of the data did not result in a loan offer. Significant imbalance

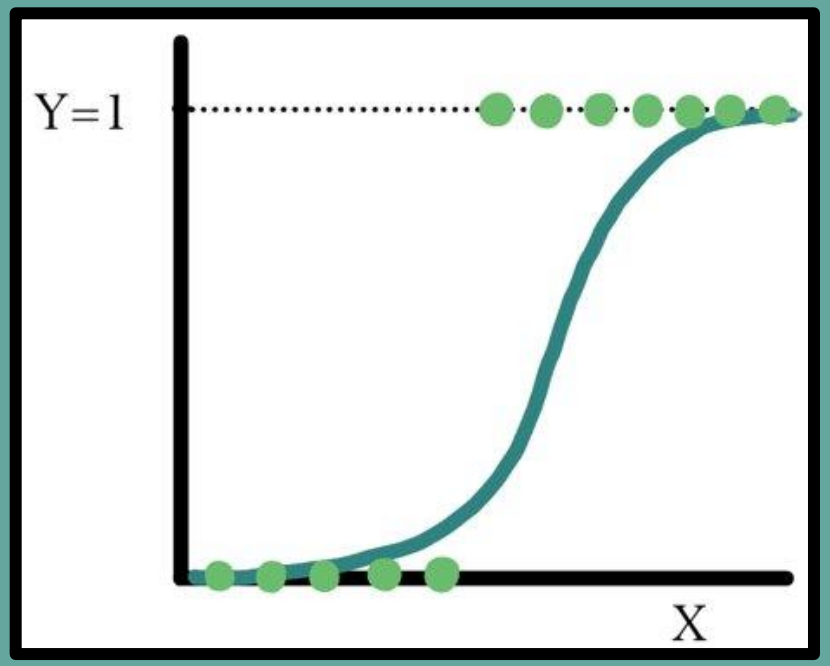
Strategy



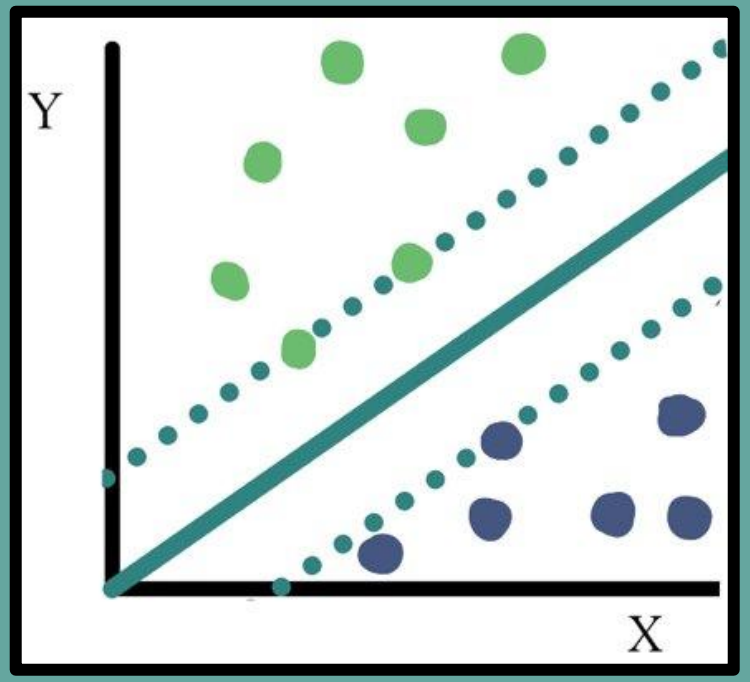
Actively reduce proportion of the cases offered a loan

Data Sample

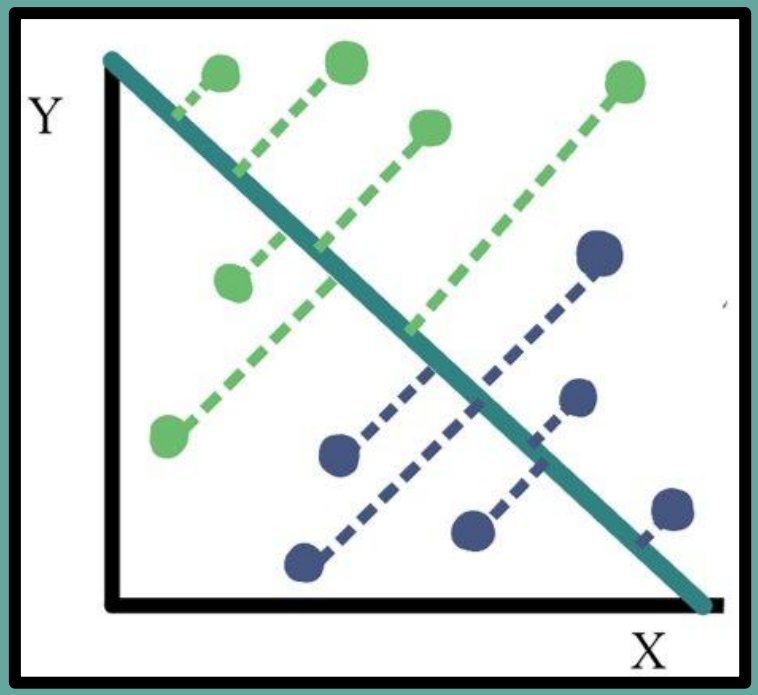
Logistic Regression



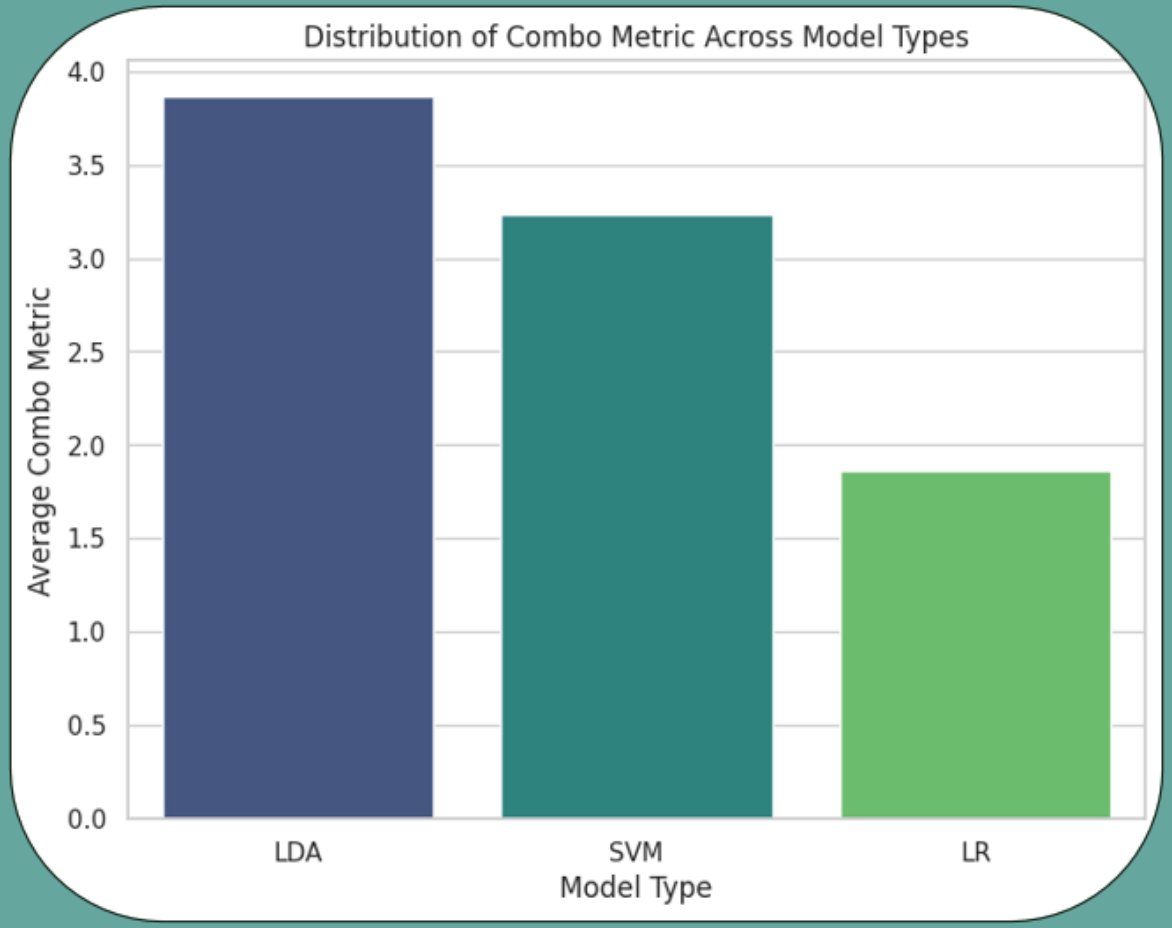
Support Vector Machine



Linear Discriminant Analysis



Model comparison



Best Performance:

LDA

Best Performing Model

ROC-AUC

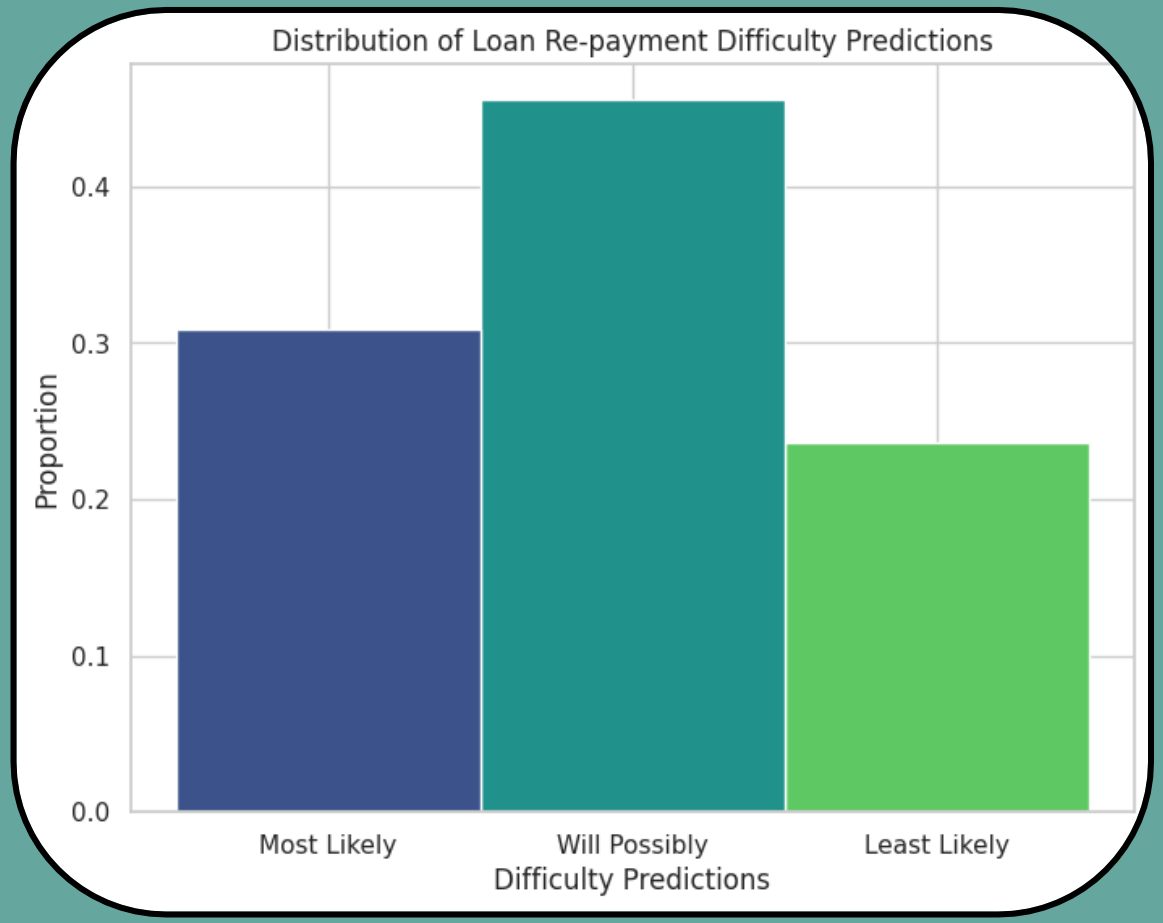
0.65

False Positive Rate

5.71%

Accuracy

68%



Best Performing Model Fit

Ethical Recommendations

Best Performing Model
Demographic Parity: 0.2747

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Unfair
Between Females and Males

Most Fair Model
Demographic Parity: 1.2315

»»

Fair
Between Females and Males

Next Steps

Assess your model needs

Ethical model?

High-performing model?

Don't let our model take out the human factor

Use as a resource, rather than the deciding factor