Loan Default Prediction

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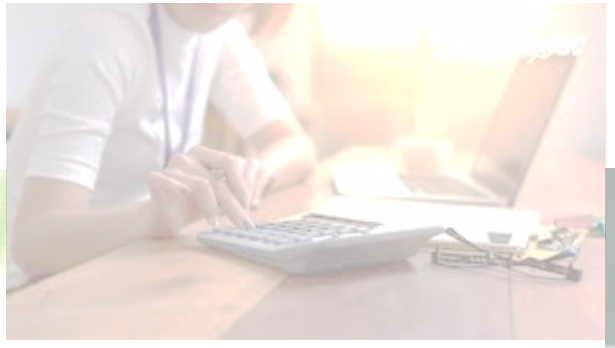


AGENDA

1. **Problem Definition**
2. **Solution Approach**
3. **Key Findings And Insights**
4. **Conclusions and Recommendations**

Overview





Context

- Home loans.
- Defaulters can reduce profit.
- Banks often establish a process to avoid bad loans.

Objective

- To automate the decision-making process of approving loans.
- Recognizing customers likely to default.

Development

- 8 different models were tested.
- Logistic Regression (4).
- Decision Tree (2).
- Random Forest (2).

Analysis

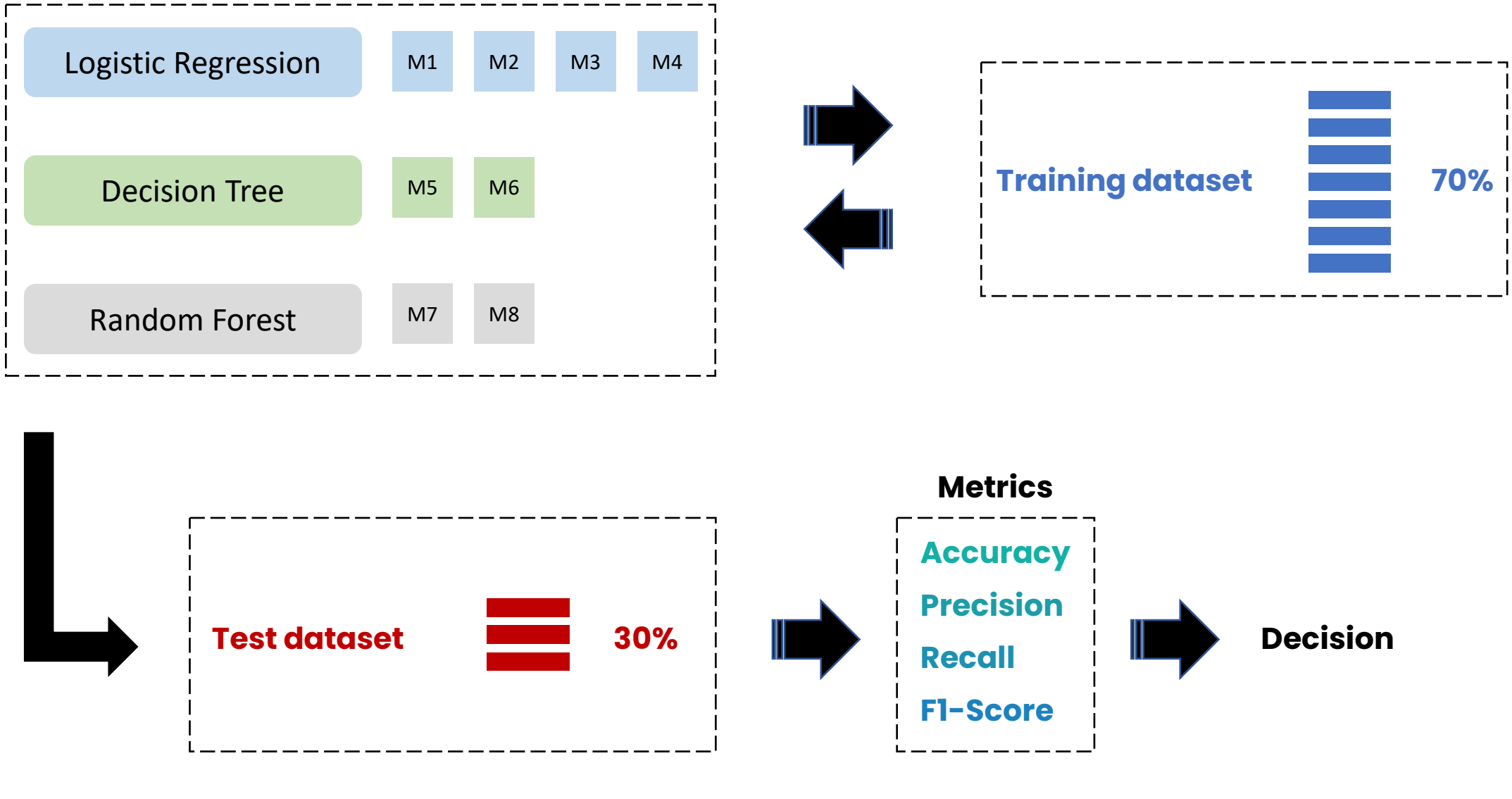
Metrics

- Accuracy
- Precision
- Recall
- F1-Score

Decision

- A valid solution should have more than 80% in all metrics.
- Recall is the most important attribute.

Models


Logistic Regression
M1
M2
M3
M4
Decision Tree
M5
M6
Random Forest
M7
M8
Training dataset
70%
Test dataset
30%
Metrics
Accuracy
Precision
Recall
F1-Score
Decision

Metrics

Accuracy

The fraction of people that were correctly classified.

Precision

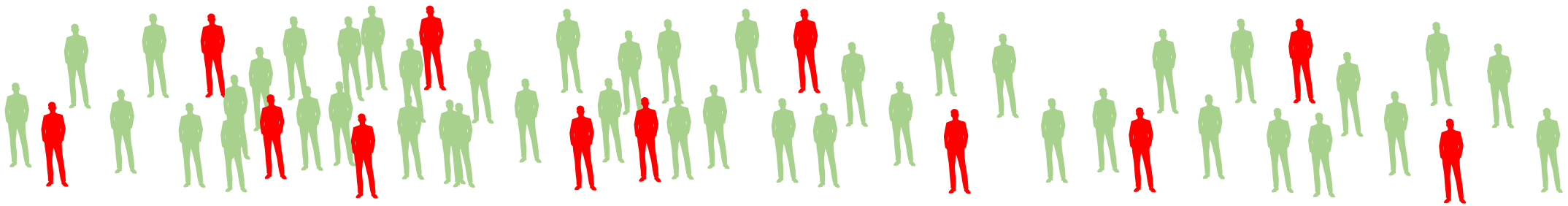
The fraction of people classified as red that are actually red.

Recall

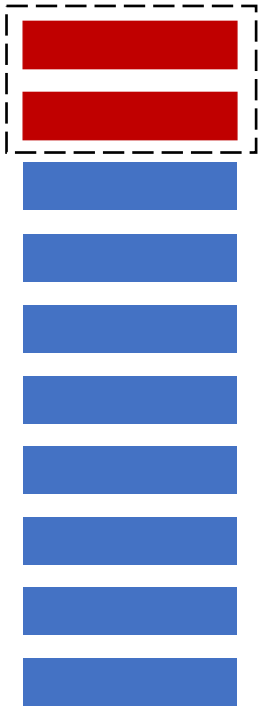
The fraction of red people that were correctly classified.

F1-Score

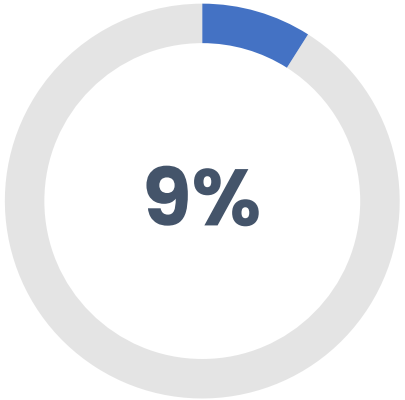
Weighted average of precision and recall.



Key Findings

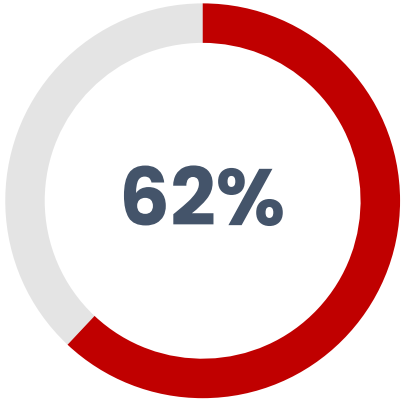


Debt-to-income ratio



Applications with the data

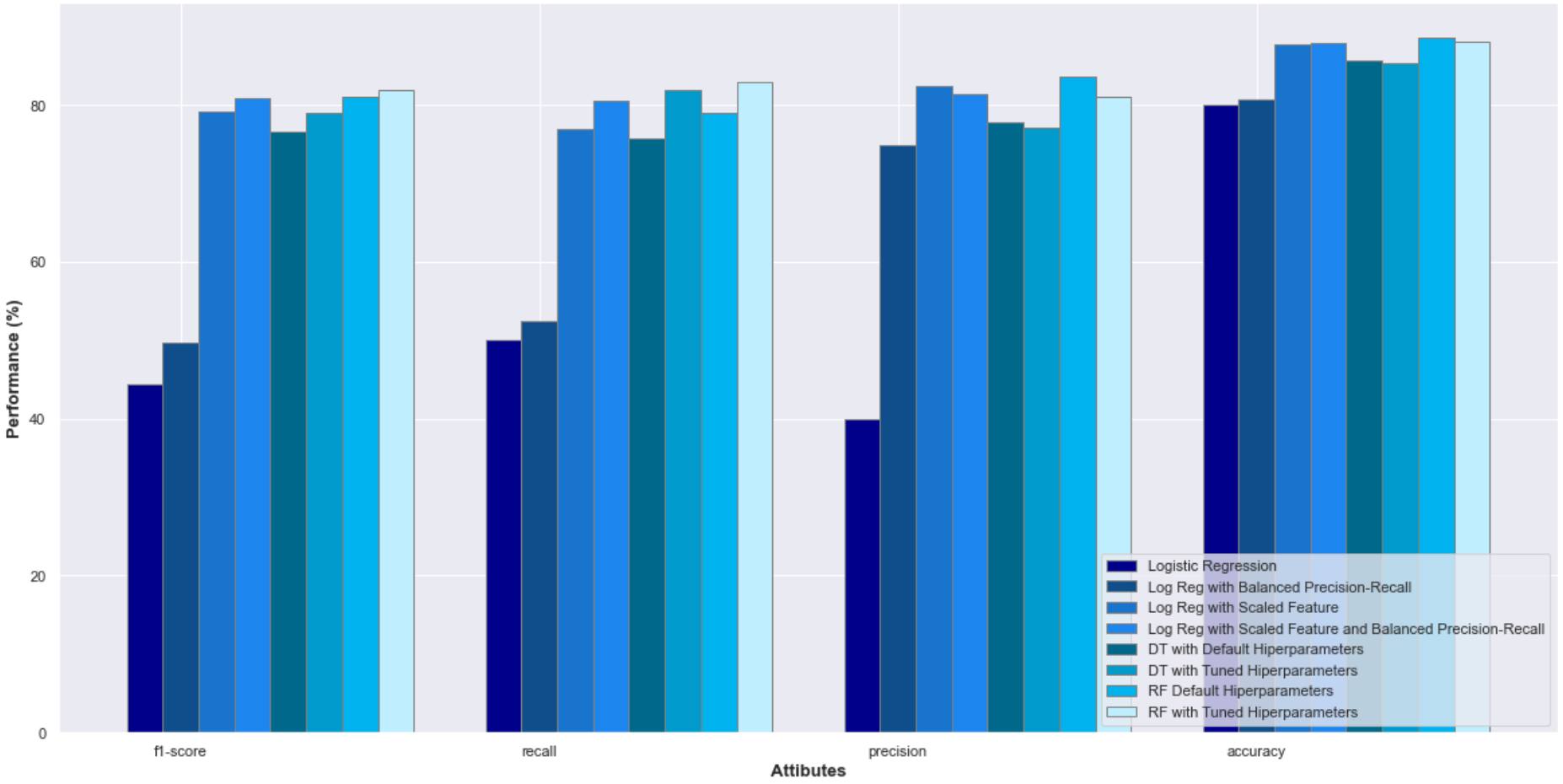
403 out of 4693 applications defaulted on the loan.



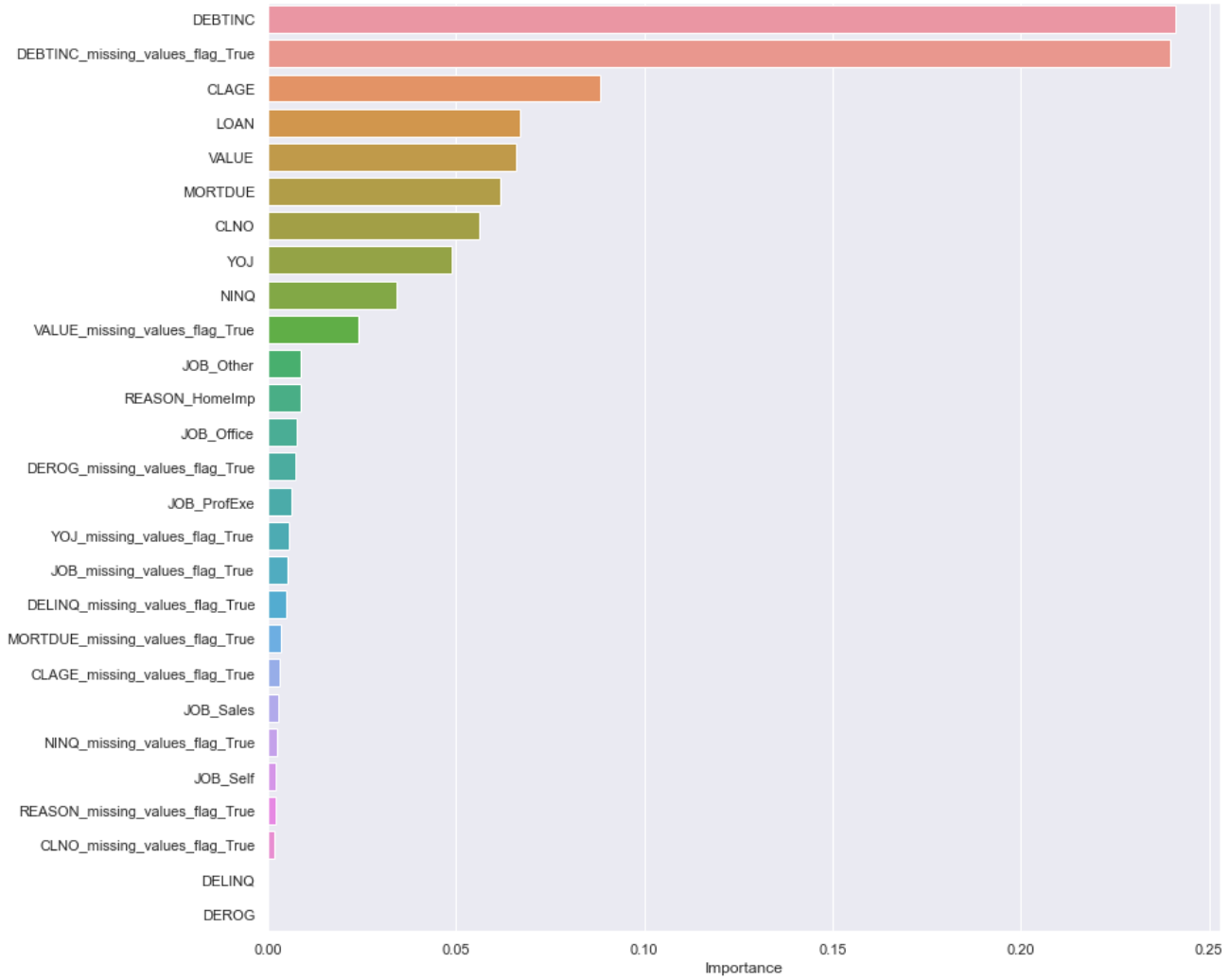
Applications missing the data

786 out of 1267 applications defaulted on the loan.

Key Findings



Key Findings



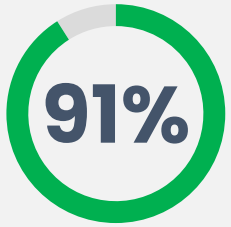
Conclusions and Recommendations

The bank **should pre-approve** loans to those customers with a debt-to-income ratio of less than 25, (use the proposed model for the final decision) as those customers have very high chances of repaying.

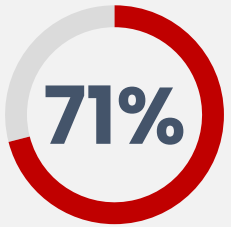
The bank **should not approve** loans to those customers with a debt-to-income ratio higher than 40, as those customers have very high chances of defaulting. For those customers, the bank should consider approving the loan only if the age of the oldest credit line is superior to 285 months.

Benefit of the model!

Correct identification



Eligible Customers



Not eligible Customers

Questions