



Delinkure

Manage Portfolio Risk using Predictive Analytics

Mortgage Default Prediction Simplified

Business Case - Portfolio Risk from Mortgage Default

To minimize loss accrued from loan default, it is crucial for Lenders, Servicers and Investors to review and assess mortgage portfolios periodically. Typically, loans that are deemed risky could have their terms renegotiated, or other measures taken through Early Resolution. In order to efficiently handle this problem on a large-scale for thousands of loans, automated tasks and machine learning tools can be leveraged to predict the default risk of a loan and overall default rating of a portfolio of loans.

The current problem is building an interface that bridges the gap between the power of these cutting-edge tools and the people who can benefit from their strengths.

Our Solution

Speridian Technologies has developed a Mortgage Default Prediction tool to categorize a loan portfolio into High, Medium and Low Risks based on a risk score derived from Machine Learning Algorithms. The tool integrates the power of data science with the modern technologies to provide a simple web interface for mortgage businesses to run their portfolio of loans and get a default rating. Available as a SaaS solution, this tool has eliminated any need for installation and allows for streamlined API integration into your current loan risk analysis workflow.

Features

- Upload and validate a loan portfolio file – excel, csv or flat files
- Process the loan portfolio file to determine the probability of default and assign risk categories to each loan accounts.
- Individually analyze loan instances and their probability of default.
- Get summary of risk categorization on the portfolio and ability to drill down on each loan assigned with a risk score.
- Download the prediction report in PDF or Excel format.
- Run Early Resolution workflows on each loan (add-on)
- Integrate with other applications through API (add-on)

Benefits

- A clear view of portfolio risks of your active mortgage accounts.
- Find risky loans before they have a default event and mitigate your potential losses.
- Prioritize the portfolio to take early resolution steps based on the risk scores.
- Integrate with risk analysis and early resolution workflow.

Approach

Speridian has combined their domain knowledge with the appropriate data science models and relevant technologies to design the solution. Below are the different components of the solutions:

Data Sets

A data set spanning one million unique loans containing 54 data elements such as Credit Score, Loan-To-Value, and Original Interest Rate was prepared and sampled. This loan-level data is combined with external factors influencing the probability either positively or negatively, such as National Housing Prices, Gas Prices, Federal Reserve Interest Rate, and Stock Market trends.

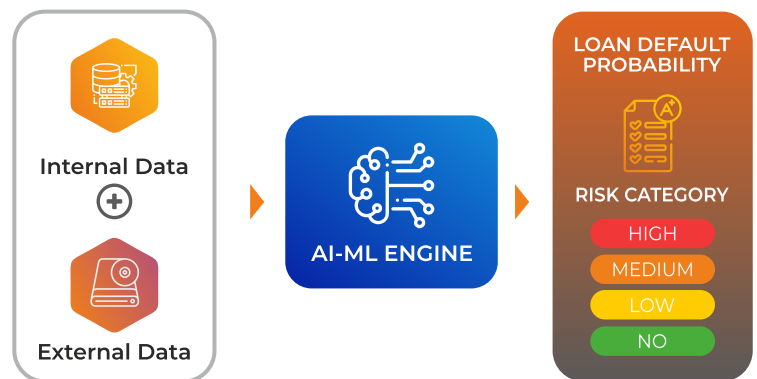


Algorithms

After carefully considering and testing multiple statistical models on our prepared data, Gradient Boosting was chosen for its high precision, fast training times, and overall performance. The class imbalance of the data was addressed by conservatively applying a pipeline of resampling algorithms; SMOTE (Synthetic Minority Oversampling Technique), and RUS (Random Under Sampling). Ultimately, our model is able to achieve an overall weighted precision of close to 97%, with an 80% accurate recall rate of the minority class.

Technology

This solution is available as a SaaS solution, built on modern web technologies and powerful machine learning framework. The solution is also containerized for easy deployment to any public or private cloud computing environment.



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