

Unlocking the Power of Machine Learning in Mortgage Credit Scoring

Abstract

Credit Scoring models have undergone a transformation in recent years, with recent developments in technology such as computational processing power and the availability of sophisticated Data Science techniques, enabling Machine Learning to be evaluated as a viable challenger to conventional scoring methods.

In the last year the Risk Decision & Data Science team at Nationwide Building Society have conducted pioneering work into the application of Machine Learning in Credit Scoring for Mortgage Applications, building upon successes achieved in breakthrough Machine Learning Scoring for Personal Loans Application and assessing Customer level risk. Through exploiting the power of advanced coding and sampling, the team have developed a Credit Score that enables enhance lending decision on Mortgages.

Due to Credit Scoring being used in the highly governed and regulated world of credit risk, in conjunction with Nationwide's desire to ensure that their members are at the heart of decisions, the need to address the following challenges was more pertinent than ever:

- Unlocking the black box – ensuring that the key model drivers are understood, and variable behaviours are intuitive
- Model robustness – ensuring that the improved member outcomes evidenced are robust over time and not subject to volatility due to over-fitting – a particular challenge given the low default volumes with Mortgages to train performance on.
- Data ethics – ensuring the model was not inadvertently identifying trends that would result in adverse outcomes for specific member groups.
- Implementable solution – ensuring the Machine Learning model was not a theoretical exercise but a practical solution which could translate into tangible benefits for Nationwide members in real life. To resolve these challenges, the Modelling team developed a bespoke Python driven toolkit that generated 1,000's of informative and innovative model diagnostics that gave a deeper understanding of how the model works. Furthermore, the team leaned on their deep understanding of Credit Risk to ensure that the proposed solution complemented existing implementation and underwriting processes ensuring the members continued to have a great customer experience.

With all of the above, we've finally been able to unlock the power of machine learning for Mortgage Credit Scoring.

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