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# Predicting Insurance Premium for Private Unit-linked Product by Using Long Short-Term Memory (LSTM) Method

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**Abstract**

This thesis explores the efficacy of Long Short-Term Memory (LSTM) networks in forecasting time series data, with a particular focus on their application to real-world datasets in private Unit-linked product in the insurance industry. The study begins by establishing a theoretical foundation for LSTM models, followed by a practical application to simulated data, where they are benchmarked against the traditional time series prediction method, Autoregressive Moving Average (ARMA). The research then transitions to the application of LSTM models to real datasets. In the empirical analysis, we develop both univariate and multivariate LSTM models. To evaluate the predictive accuracy and generalizability of these models, we compare their performance against a baseline Moving Average (MA) model. The findings suggest that ARMA models may excel in certain scenarios, while LSTM networks offer robust alternative for complex time series forecasting. This is evidenced by their ability to capture the interconnectedness within the data, resulting in more accurate predictions compared to the baseline MA model.

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