

## **Abstract**

Portfolio is a collection of assets owned by individuals or groups for a particular economic purpose. To build an optimal portfolio there are two things that must be considered, namely return and risk. By optimizing the portfolio, it is hoped that it will produce a portfolio with high returns and low risk. To get the optimal portfolio previously used the Mean-Variance method, but after analysis it turns out that the resulting performance is still unsatisfactory. This is due to errors in the estimation of the covariance matrix and the mean return. Over time, many methods have been used to improve the performance of the Mean-Variance method. One way to improve the performance of the Mean-Variance method is to apply the regularization method to the objective function of the Mean-Variance method and apply the Shrinkage method to estimate the covariance matrix. Therefore, in this final project, a stock portfolio is built using the Mean-Variance method with L1-regularization and Shrinkage. Based on the results of the tests that have been carried out, it can be concluded that applying L1-regularization and Shrinkage to the Mean-Variance method can improve the resulting performance by producing a higher sharpe ratio value with a value of 0.63. Meanwhile, the portfolio generated by the Mean-Variance method that does not use L1-regularization and Shrinkage produces a worse sharpe ratio, with a value of 0.38.

**Keywords:** portfolio, stock, mean-variance, regularization, shrinkage, IDX30