DS 2025

Data Science Lab 6

Team nr: 2	Student 1: Åmund Grimstad	IST nr: 1116675
	Student 2: Arthur de Arruda Chau	IST nr: 1116090
	Student 3: Benjamin Raymond Kuhn	IST nr: 1115778
	Student 4: João Rafael Freitas Lourenço	IST nr: 425699

FORECASTING MODELS

Traffic Time Series

Exponential Smoothing

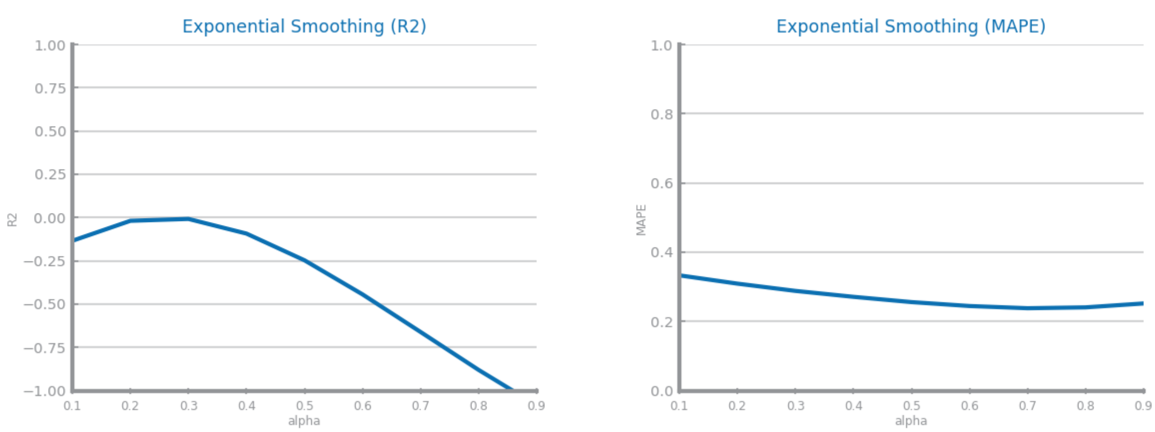

Figure 1: Exponential Smoothing R2 and MAPE study for Traffic Time Series

Figure 2: Exponential Smoothing R2 and MAPE evaluation results for Traffic Time Series

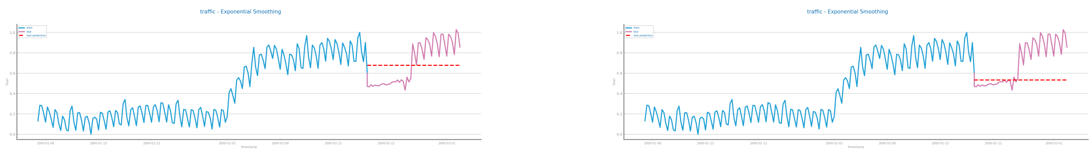

Figure 3: Exponential Smoothing R2 and MAPE forecasting for Traffic Time Series

Multi-layer Perceptron

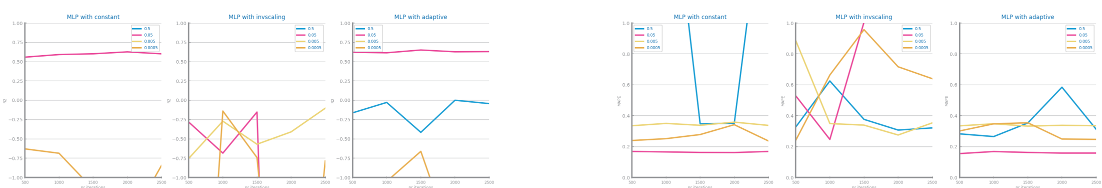

Figure 4: MLP R2 and MAPE study for Traffic Time Series

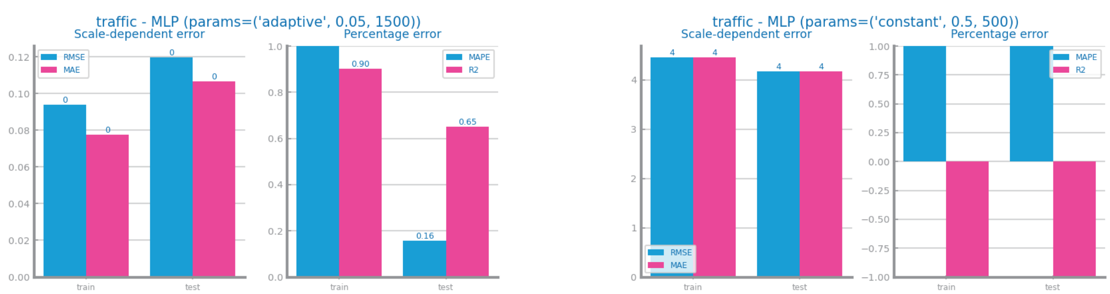

Figure 5: MLP R2 and MAPE evaluation results for Traffic Time Series

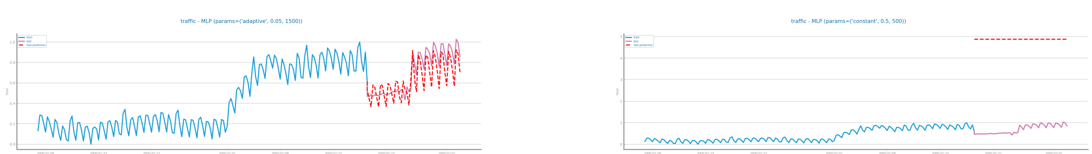

Figure 6: MLP R2 and MAPE forecasting for Traffic Time Series

ARIMA

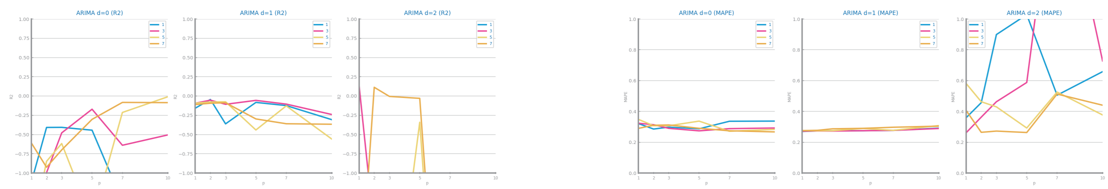

Figure 7: ARIMA with exogenous variables R2 and MAPE study for Traffic Time Series

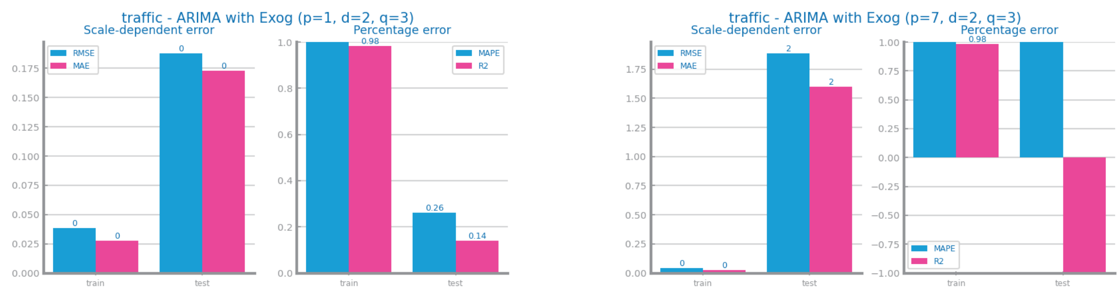

Figure 8: ARIMA with exogenous variables R2 and MAPE evaluation results for Traffic Time Series

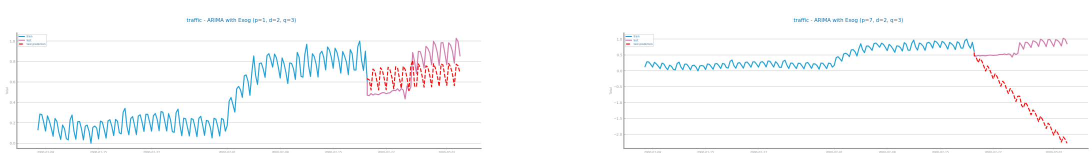

Figure 9: ARIMA with exogenous variables R2 and MAPE forecasting for Traffic Time Series

LSTM

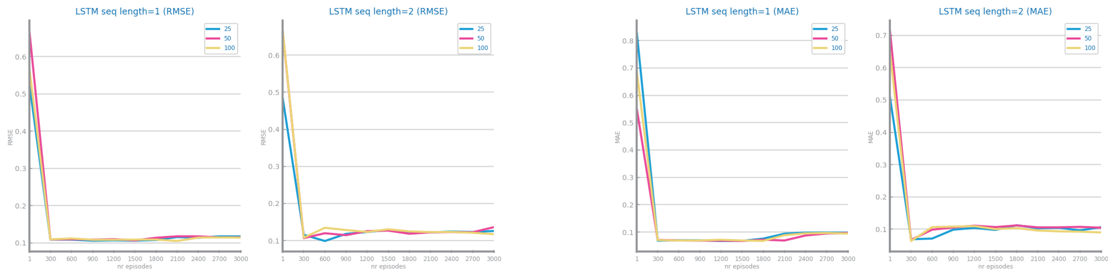

Figure 10: LSTM RMSE and MAE study for Traffic Time Series

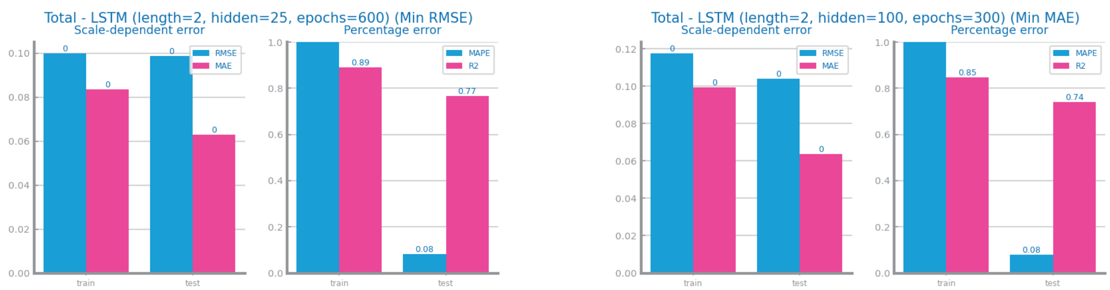

Figure 11: LSTM RMSE and MAE evaluation results for Traffic Time Series

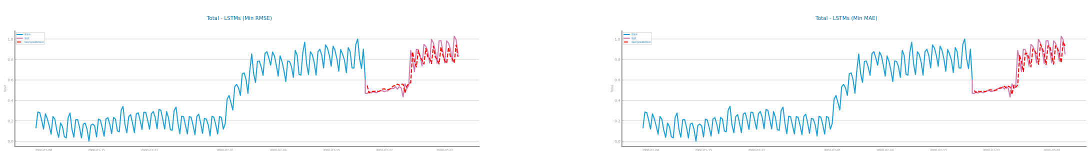

Figure 12: LSTM RMSE and MAE forecasting for Traffic Time Series

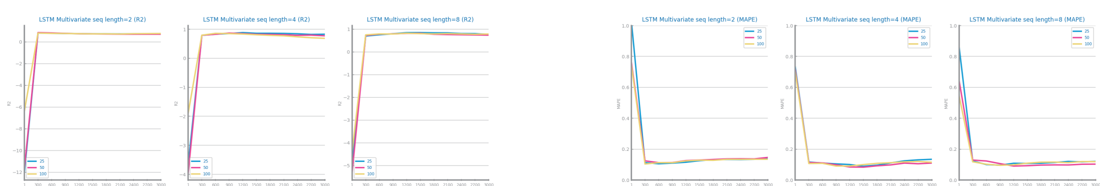

Figure 13: Multivariate LSTM R2 and MAPE study for Traffic Time Series

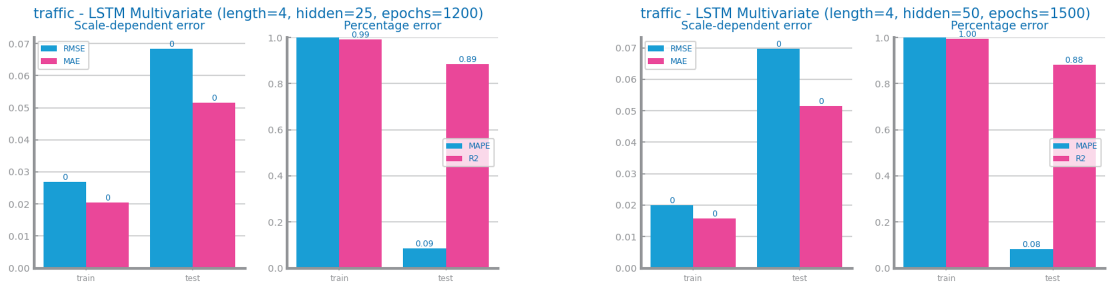

Figure 14: Multivariate LSTM R2 and MAPE evaluation results for Traffic Time Series

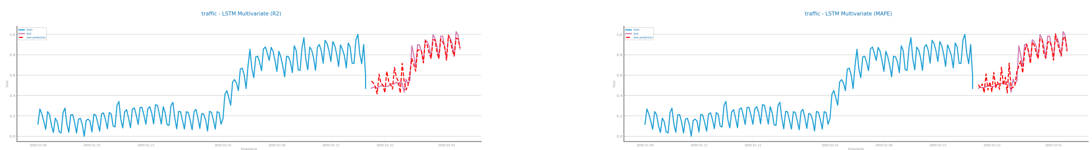

Figure 15: Multivariate LSTM R2 and MAPE forecasting for Traffic Time Series

Inflation Rate Time Series

Exponential Smoothing

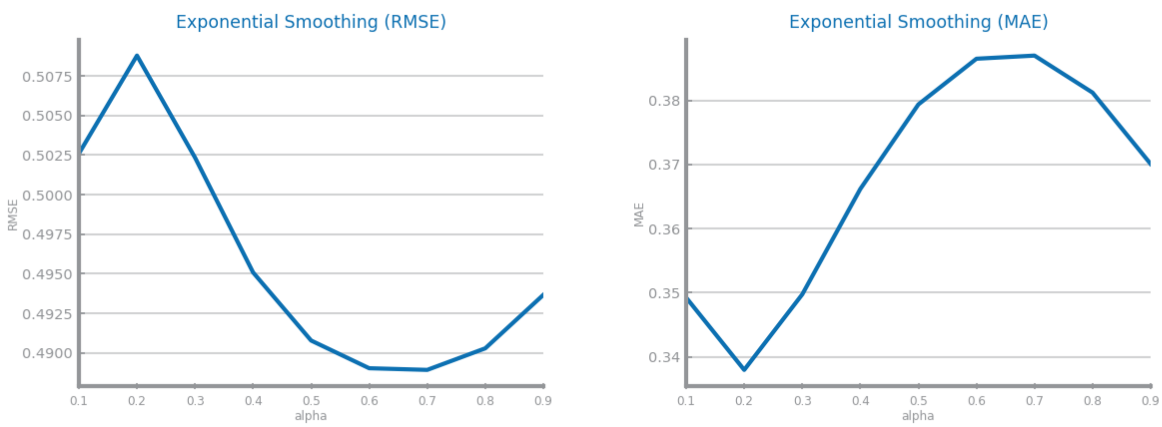

Figure 16: Exponential Smoothing RMSE and MAE study for Inflation Rate Time Series

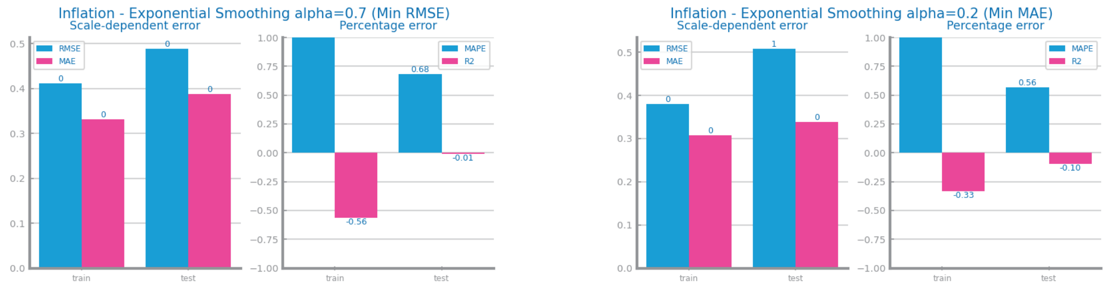

Figure 17: Exponential Smoothing RMSE and MAE evaluation results for Inflation Rate Time Series

Figure 18: Exponential Smoothing RMSE and MAE forecasting for Inflation Rate Time Series

Multi-layer Perceptron

Used a lag of k=4 (years)

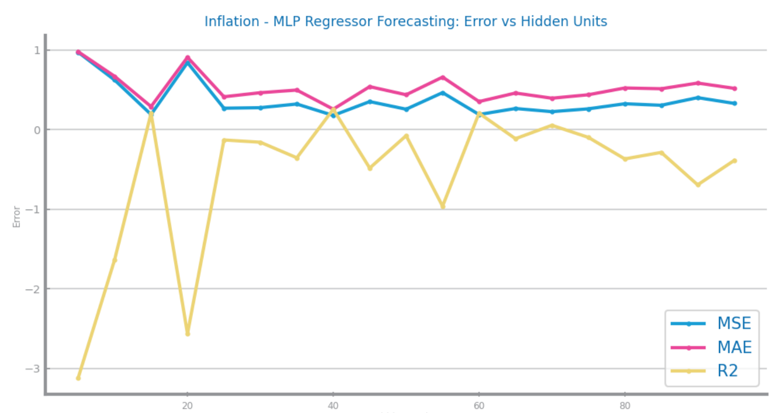

Figure 19: MLP RMSE, MAE and R2 study for Inflation Rate Time Series

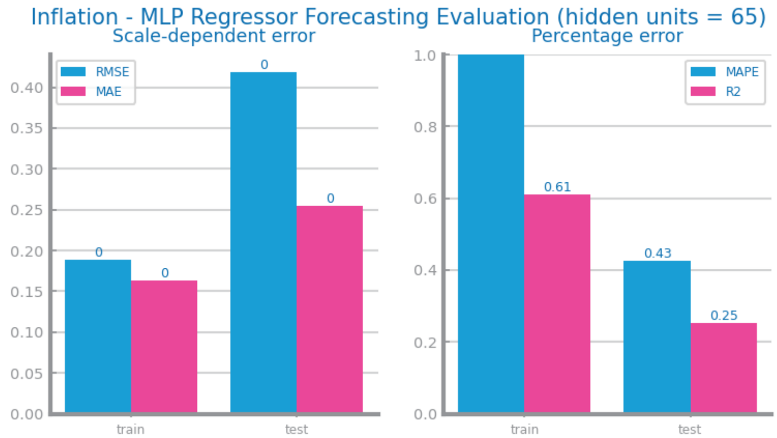

Figure 20: MLP R2 evaluation results for Inflation Rate Time Series

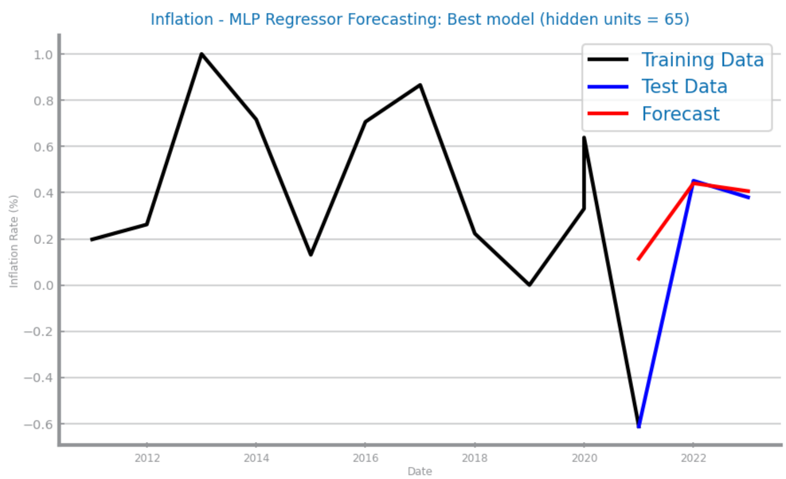

Figure 21: MLP Best model (based on R2) forecasting for Inflation Rate Time Series

ARIMA

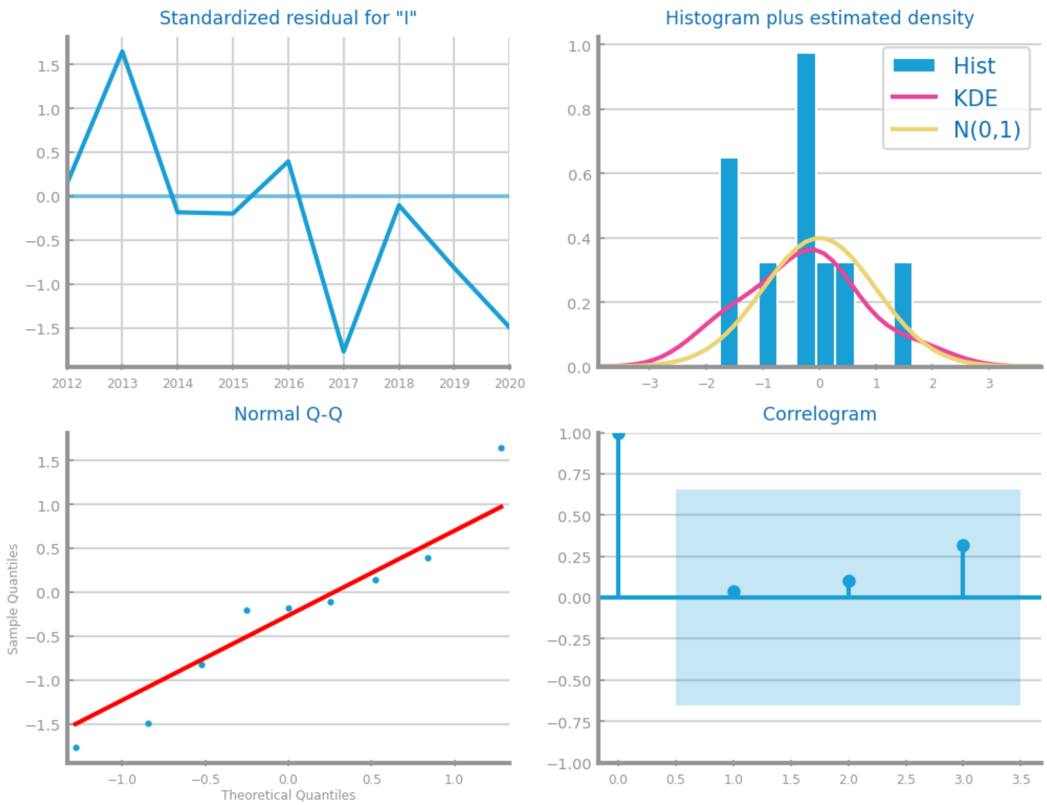

Figure 22: ARIMA diagnostics for Inflation Rate Time Series

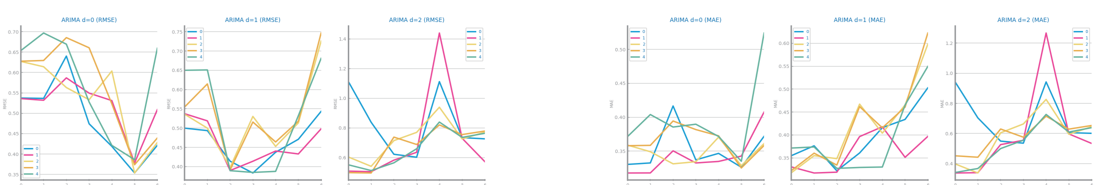

Figure 23: ARIMA RMSE and MAE study for Inflation Rate Time Series

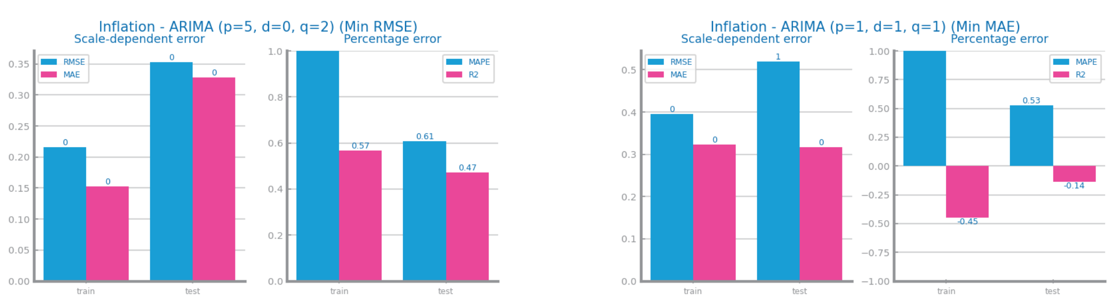

Figure 24: ARIMA RMSE and MAE evaluation results for Inflation Rate Time Series

Figure 25: ARIMA RMSE and MAE forecasting for Inflation Rate Time Series

LSTM

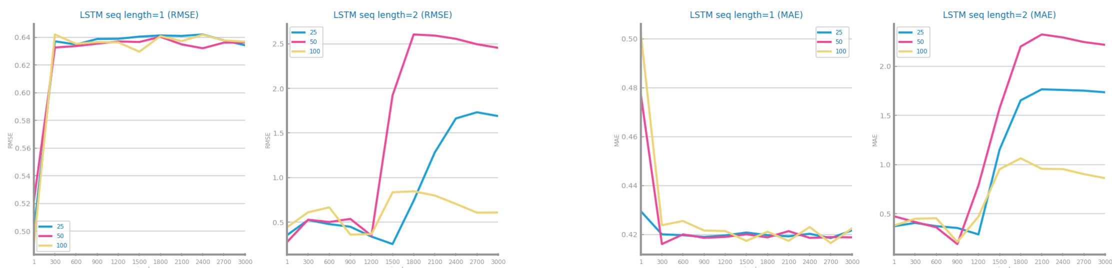

Figure 26: LSTM RMSE and MAE study for Inflation Rate Time Series

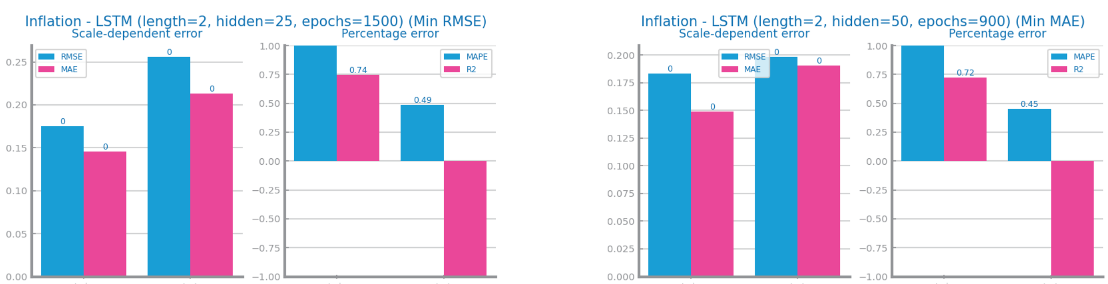

Figure 27: LSTM RMSE and MAE evaluation results for Inflation Rate Time Series

Figure 28: LSTM RMSE and MAE forecasting for Inflation Rate Time Series