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A Stepwise Approach to Automate the Search for Optimal Parameters in Seasonal ARIMA Models

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Abstract : Reliable forecasts of univariate time series data are often necessary for several contexts. ARIMA models are quite popular among practitioners in this regard. Hence, choosing correct parameter values for ARIMA is a challenging yet imperative task. Thus, a stepwise algorithm is introduced to provide automatic and robust estimates for parameters (p; d; q)(P; D; Q) used in seasonal ARIMA models. This process is focused on improvising the overall quality of the estimates, and it alleviates the problems induced due to the unidimensional nature of the methods that are currently used such as auto.arima. The fast and automated search of parameter space also ensures reliable estimates of the parameters that possess several desirable qualities, consequently, resulting in higher test accuracy especially in the cases of noisy data. After vigorous testing on real as well as simulated data, the algorithm doesn't only perform better than current state-of-the-art methods, it also completely obviates the need for human intervention due to its automated nature.

Keywords : time series, ARIMA, auto.arima, ARIMA parameters, forecast, R function
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