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A Study on Determination of Weight Parameters of Double Exponential Smoothing Technique for Time Series

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Abstract

A time series is generally considered as an ordered sequence of measurements or values of a variable at equally spaced time intervals. The time series models are useful in many applications to understand the underlying forces and structure that produced the observed series of values as well as to forecast future events of the observed process.Double Exponential Smoothing technique is one of the most important quantitative techniques in forecasting. The accuracy of forecasting by this technique depends onparameters associated with the technique.Choosing appropriate values for these parameters is very crucial to minimize the error in-forecasting. Normally, trial and error method is used to determine the optimal values for these parameters even though non-linear optimization techniques, such as the Levenberg-Marquardt method, are available for estimating such parameters but with a considerably high computational cost. On the other hand, the choice of parameters using trial and error methods requires calculation of error measures to choose most suitable parameters.In this work a parameter estimation program known as PEST is used to estimate the optimal values of parameters for double exponential smoothing technique. PEST is an independent program that can be used without changing the model in order to estimate the parameters required for the model. It requires only an executable program that takes the parameters and produces predictions, based on the given parameters, to match with the observed values. This study shows that the almost all the error measures in predictions which were generated by using the parameters estimated by PEST are considerably very small. It is identified that the estimation of such parameters using PEST is an efficient and effective technique when compared to trial and error method in estimating parameters for Double Exponential Smoothing technique.

Keywords: *Exponential Smoothing Constant, Parameter, PEST*