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A WEIGHTED FUZZY TIME SERIES MODEL FOR FORECASTING SEASONAL DATA

(Suatu Model Siri Masa Kabur Berpemberat untuk Meramal Data Bermusim)

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ABSTRACT

This study proposes a weighted model and graphical order selection in fuzzy seasonal time series forecasting. Initially, the fuzzy relationships were treated as if they were equally important, which might not properly reflected the importance of each individual fuzzy relationship in forecasting. Then, a linear chronological weight is introduced to handle the importance of each chronological individual fuzzy relationship. This paper proposes a naïve, uniform, and exponential chronological weight which is developed based on the concept of naïve, moving average, and exponential smoothing methods. In addition, graphical order fuzzy relationship is proposed to identify the best Fuzzy Logical Relationship order of fuzzy time series model. A quarterly data set is selected to illustrate the proposed method and to compare the forecasting accuracy with three other fuzzy time series models and two classical time series models. The results of the comparison using the test data show that the proposed method produces more precise forecast values than the other methods.

Keywords: Naïve, uniform, exponential weight; fuzzy time series; graphical order; seasonality

ABSTRAK

Kajian ini mencadangkan model berpemberat dan pemilihan tertib bergraf dalam peramalan siri masa kabur bermusim. Pada mulanya, hubungan kabur diandaikan sama penting, yang kemungkinannya tidak mencerminkan kepentingan sebenar setiap hubungan kabur dalam peramalan. Kemudian, satu pemberat linear kronologi diperkenalkan untuk menangani kepentingan setiap hubungan kabur individu kronologi. Makalah ini mencadangkan pemberat naif, seragam dan eksponen berkronologi yang dibangunkan berdasarkan konsep naif, purata bergerak dan kaedah pelicinan eksponen. Selanjutnya, hubungan kabur tertib bergraf diperkenalkan untuk mengenal pasti tertib hubungan logik kabur terbaik bagi model siri masa kabur. Data sukuan dipilih untuk menjelaskan kaedah yang dicadangkan dan untuk membuat perbandingan ketepatan peramalan dengan tiga model siri masa kabur dan dua model siri masa klasik. Hasil dapatan menggunakan data ujian menunjukkan kaedah yang dicadangkan menghasilkan nilai ramalan yang lebih tepat berbanding dengan kaedah lain.

Kata kunci: Pemberat naif, seragam, bereksponen; siri masa kabur; peringkat bergraf; kebermusiman

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