Fractal Based Time Series Forecasting

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This research proposes to approach forecasting using classes defined by a fractal scheme. In time series analysis, forecasting is understood as generating a prediction based on known previous records. This process is important in all STEM fields. An initial time series was configured into classes, which are then analyzed in their ‘from-to’ transition frequency. A forecast was created by choosing the class most transitioned into considering the class recorded in the previous time period. To test this idea, a time series of the monthly average temperature in San Juan was used. In addition, the method proposed here was compared to the well-known naïve method. This method simply generates a forecast by setting a prediction equal to the record in the previous time period. Using the sum of absolute differences as the performance metric, the proposed method obtained a value of 23.05 while the naïve method obtained a value of 25.00. The researcher’s test reached more accurate forecasts using the proposed method rather than the naïve method, which is encouraging and prompts to further expand the development of this idea. The fractal scheme was found to be convenient for both value representation and to support forecasting. For future research, more than one previous record should be considered, and the proposed method should be computer coded for convenience. A fractal scheme to support forecasting is an idea that should be expanded in its study given that, due to its nature, it could be of great relevance to scientific and non-scientific communities.

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