AutoRegression Models

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INTRODUCING AUTO REGRESSION MODELS THROUGH DATA VISUALIZATION

Introduction

Autoregression (AR) is a statistical modeling technique to predict future values based on past values within a time series. It finds extensive applications in finance, weather forecasting, and signal processing.

Autoregression is a fundamental building block for more advanced time series models like ARIMA and state-space models. It is essential for creating predictive systems that address diverse real-world challenges.

Background

Time series is a sequence of data points indexed in time order

Basics of AR models

AR models express the current value of the series as a linear combination of its previous values and a noise term:

$$X_t = \phi_1 X_{t-1} + \phi_2 X_{t-2} + \ldots + \phi_p X_{t-p} + \epsilon t$$

Where:

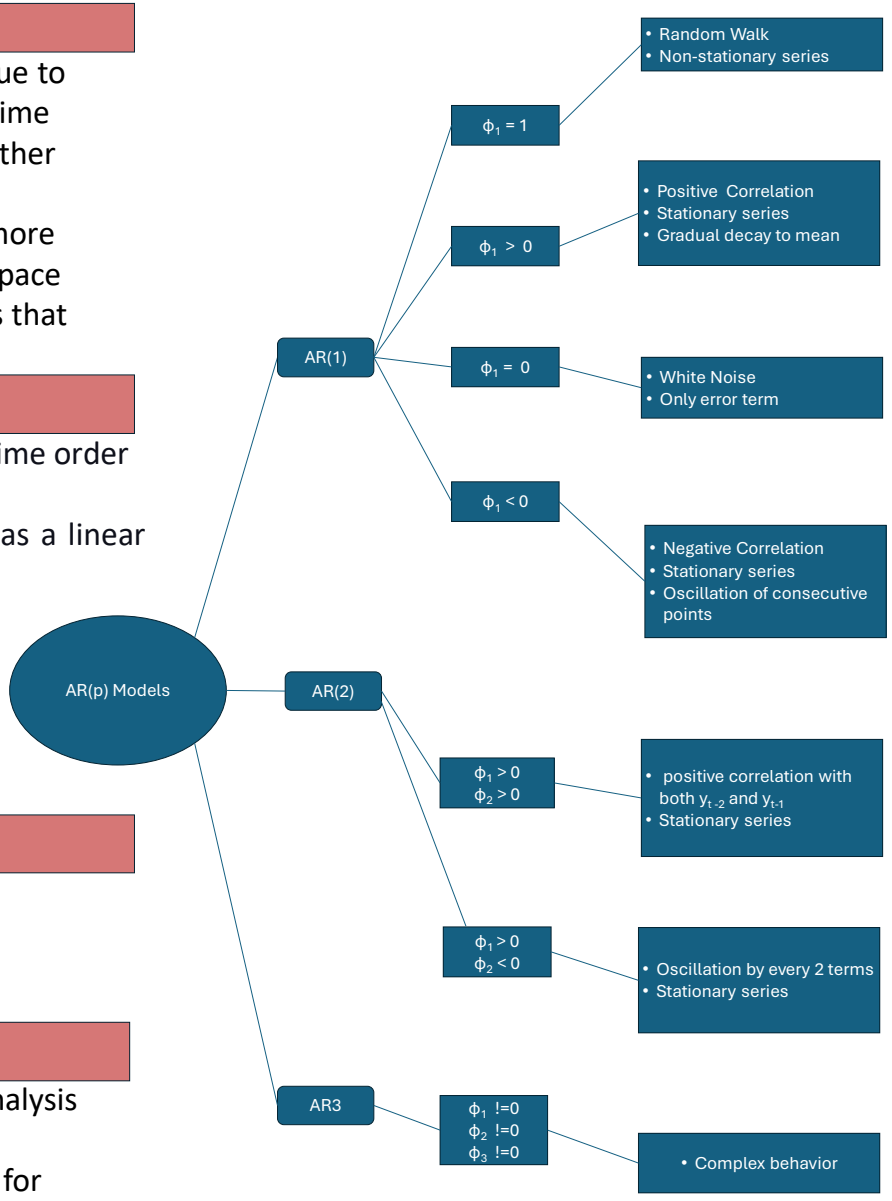
- ϕi: Coefficients of the AR model.
- ϵ_t: A white noise term representing random error.
- p: Order of AR model

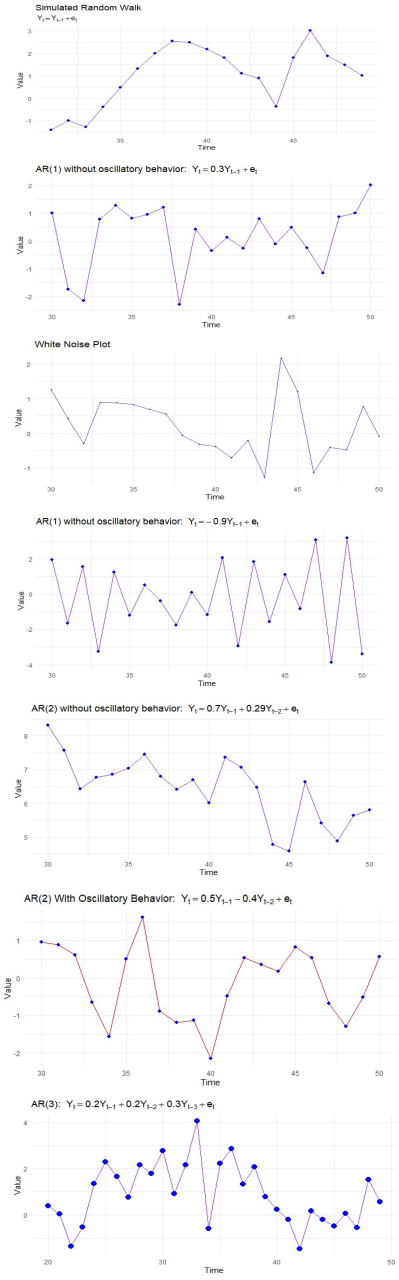
Application & Future perspective

- **Finance**: Stock price predictions.
- **Weather**: Temperature and rainfall forecasting.
- **Economics**: GDP and inflation rate modeling.

Conclusion

- AR models are foundational tools in time series analysis and have versatile applications across industries.
- Their simplicity makes them a great starting point for understanding more complex time series models.





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