

# 1 Questions for Self-Check In Time Series Analysis

1. Definition of a Time Series;
2. Tasks of Time Series Analysis and its Examples;
3. Specificity of the Time Series additive model, types of the time series models;
4. Difference between Trend (including cyclic part) and Seasonality;
5. Meaning of the noises in the Time Series Analysis, definition of the White-Gaussian-Noises (and Identity Independent Distributed noise, I.I.D.) in the Time Series Analysis;
6. Difference between deterministic and stochastic trend models;
7. Definition of Stationary and Non-Stationary series and Examples of such time series;
8. Definition of Univariate and Multivariate series;
9. Main statistical characteristics of Time Series (mean, std, variance, autocorrelation function, partial-autocorrelation function, cross-correlation function);
10. Tasks of Residual Analysis;

11. Types of Moving-Average (Simple, Weighted; Exponential, Holt, Holt-Winter, Error, Trend, Seasonal).
12. Task of ARMA (Autoregressive–moving-average ) modeling.
13. Aim of usual difference (ARIMA) and seasonal difference (SARIMA).
14. Difference between ARMA, ARIMA, SARIMA, SARIMAX.
15. Meaning of SARIM orders  $(p,d,q)(P,D,Q)s$ .
16. ARIMA measures: AIC, BIC -what the difference with just RSS.
17. Tasks of Exploratory Data Analysis.
18. Tasks of Feature extraction.
19. Tasks of Feature selection.
20. Tasks of Feature representation.
21. Difference between frequency- and time- domain representation.
22. Tasks of Time Series Clustering.
23. Tasks of Time Series Classification.
24. Types of time series Distances.
25. Tasks of Time Series Anomaly detection.
26. Reasons why you need to use Deep learning in Time Series Analysis.
27. Types of Deep learning Neural Networks in Time Series Analysis.
28. Meaning of the dialed convolution in Time Series Analysis.

29. Advantages and Disadvantages of using Recurrent neural networks in Time Series Analysis.

30. Advantages and Disadvantages of using Attention-based networks in Time Series Analysis.

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