Time Series-2

12 out of 12 correct

1. What does ARIMA stand for in time series analysis?

- (●) Autoregressive Integrated Moving Average
- ( ) Average Regression Interpolation Moving Analysis
- ( ) Advanced Randomness Integration Model Analysis
- ( ) Autocorrelated Random Intercept Mean Analysis

Explanation: ARIMA stands for Autoregressive Integrated Moving Average, which is a widely used time series analysis method for forecasting.

2. What is the main intuition behind ARIMA?

- (●) To model the autoregressive relationship between the time series and its lags
- ( ) To model the moving average relationship between the time series and its lags
- ( ) To model the seasonal variation in the time series
- ( ) To model the trend in the time series

Explanation: The main intuition behind ARIMA is to model the autoregressive relationship between the time series and its lags. Autoregression refers to the dependence of the time series on its own past values, and ARIMA models this dependence by using lagged values of the time series as predictors.

3. What is the difference between AR and MA models in ARIMA?

- (●) AR models use lagged values of the time series as predictors, while MA models use lagged errors as predictors

- ○ AR models use lagged errors as predictors, while MA models use lagged values of the time series as predictors
- ○ AR and MA models are the same and can be used interchangeably
- ○ AR and MA models are not used in ARIMA

Explanation: AR and MA models are both components of ARIMA, but they have different roles. In an AR model, the dependent variable is regressed on its own past values, while in an MA model, the dependent variable is regressed on lagged errors.

4. What is the intuition behind differencing in ARIMA?

- ○ To remove the trend from the time series
- ○ To remove the seasonal variation from the time series
- ◉ To make the time series stationary
- ○ To make the time series non-stationary

Explanation: The intuition behind differencing in ARIMA is to make the time series stationary, which means that the statistical properties of the time series (such as the mean and variance) do not change over time. Differencing involves taking the difference between consecutive values of the time series, which can help remove trends and other non-stationary patterns.

5. Which of the following is a limitation of ARIMA models?

- ◉ They cannot handle non-linear relationships between the time series and its predictors
- ○ They cannot handle seasonality in the data
- ○ They cannot handle missing data in the time series
- ○ They cannot handle large datasets

Explanation: ARIMA models assume a linear relationship between the time series and its predictors, and therefore cannot handle non-linear relationships. If the relationship between the time series and its predictors is non-linear, other methods such as neural networks or support vector machines may be more appropriate.

6. Which of the following is not a step in the ARIMA modelling process?

- ◯ Identifying and removing outliers
- ◯ Plotting the autocorrelation and partial autocorrelation functions
- ◉ Fitting a linear regression model to the time series data
- ◯ While linear regression is a related technique, it is not part of the ARIMA modelling process.

Explanation: While linear regression is a related technique, it is not part of the ARIMA modelling process.

7. Which of the following is a common method for selecting the order of the ARIMA model?

- ◯ Maximum likelihood estimation
- ◉ Akaike information criterion (AI(c)
- ◯ Bayes factor
- ◯ Pearson correlation coefficient

Explanation: The Akaike information criterion (AI(c) is a widely used method for selecting the order of the ARIMA model. It balances the fit of the model to the data with the complexity of the model.

8. When differencing a time series, what does a first-order difference mean?

- ◉ Subtracting the current value of the time series from the value at lag 1
- ◯ Subtracting the current value of the time series from the value at lag 2
- ◯ Subtracting the value at lag 1 from the value at lag 2
- ◯ Subtracting the value at lag 2 from the value at lag 1

Explanation: A first-order difference involves taking the difference between consecutive values of the time series, which can be written as Y(t) - Y(t-1).

9. Which of the following is not a type of ARIMA model?

- ○ ARMA
- ◉ ARMAV
- ○ ARIMA
- ○ SARIMA

Explanation: ARMAV is not a standard type of ARIMA model

10. Which of the following is a method for diagnosing the residuals of an ARIMA model?

- ◉ Plotting the autocorrelation and partial autocorrelation functions
- ○ Fitting a linear regression model to the residuals
- ○ Plotting the residuals against the time index
- ○ Calculating the Pearson correlation coefficient

Explanation: The autocorrelation and partial autocorrelation functions can be used to diagnose the residuals of an ARIMA model. If there is still structure in the residuals (e.g., significant autocorrelation at lag 1), this suggests that the model may not be a good fit for the data.

11. Which of the following is not a common method for forecasting with an ARIMA model?

- ○ Recursive forecasting
- ○ Rolling window forecasting
- ◉ Backward forecasting
- ○ One-step-ahead forecasting

Explanation: Backward forecasting is not a standard method for forecasting with an ARIMA model.

12. Which of the following is a common method for evaluating the performance of an ARIMA model?

- ○ Mean absolute percentage error (MAPE)
- ○ Mean squared error (MSE)
- ○ Root mean squared error (RMSE)
- ◉ All of the above

Explanation: All of these metrics are commonly used to evaluate the performance of an ARIMA model.

Submit