The ARIMA (Autoregressive Integrated Moving Average) model relies on several key assumptions to effectively model time series data and produce reliable forecasts. These assumptions include:

Key Assumptions of ARIMA Models

- Stationarity: The time series must be stationary, meaning its statistical properties (mean, variance) do not change over time. Stationarity can be achieved through differencing the data.
- Linearity: ARIMA models assume a linear relationship between the current value of the time series and its past values. If the relationship is non-linear, modifications or alternative models may be required.
- Independence of Errors: The residuals (errors) from the model fitting should be independent of each other. This means that the errors should not show any autocorrelation.
- Normally Distributed Errors: While not strictly necessary, it is generally assumed that the residuals of the model are normally distributed. This assumption aids in statistical testing and the validity of inferences based on the model.
- Constant Variance (Homoscedasticity): The variance of the errors should remain constant over time. If the variance changes (heteroscedasticity), the model may require adjustments or a transformation of the data.