Time Series

Box Jenkins

Single Time Series

check if time series data is co - variance stationary

1. Mean, variance & co - variance
2. Plot ACF & PACF
3. Dikki Fuller Test & Augmented DF Test.

Yes

No

Detrend & Descasanalize

1. linear & log linear regression for trend.
2. Dummy variable regression for seasonality

Differencing

1. First order differencing for trend.
2. Seasonal differencing for seasonality.

Cov. stationary

Model Selection → ARMA

1. Plot ACF & PACF
2. Use A/C, B/C

Based on Model parameters find fitted Yt & ct

Check

1. Plot ACF & PACF
2. Ljung Box & Box Pierce Q Statistic

Error term is White Noise

- independent

  i.e., no serial correlation btw error terms
- identically distributed

  i.e., constant Mean & Variance

Error term is not White Noise

Not Independent

i.e. serial correlation btw error terms.

Check Model specification again.

Not Identically distributed

i.e. variance is not constant

improve your model by using GARCH & ARCH

Use Model for Forecasting

n - period ahead forecasts.

Multiple Time Series

We can use regression model but we check for co - integration

Dikki Fuller - Engle Gramer Test.