SEASONAL DECOMPOSITION

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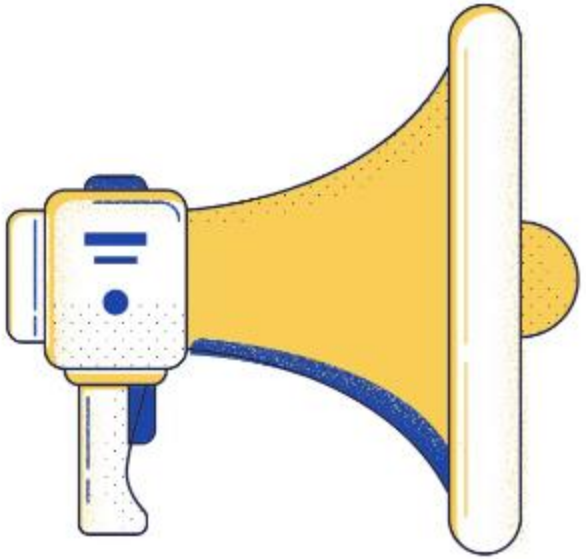
Seasonal Decomposition

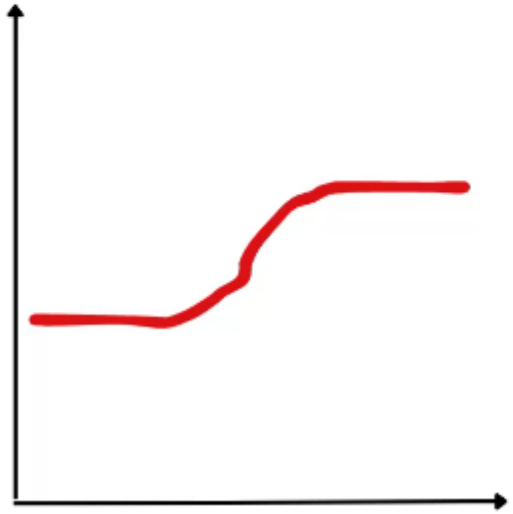
Cognate/Professional Electives



Seasonal Decomposition identifies the trend, seasonality, and error term

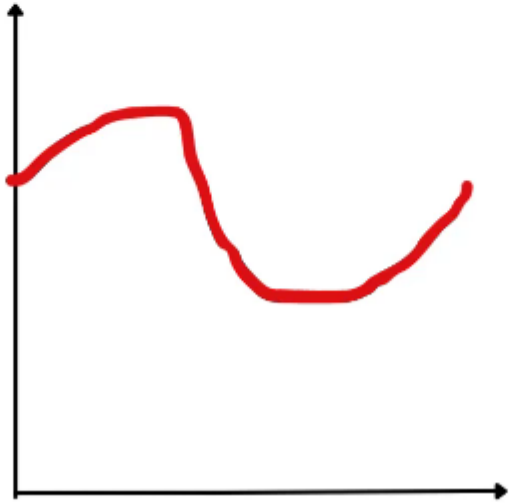
Trend

General direction of the time series



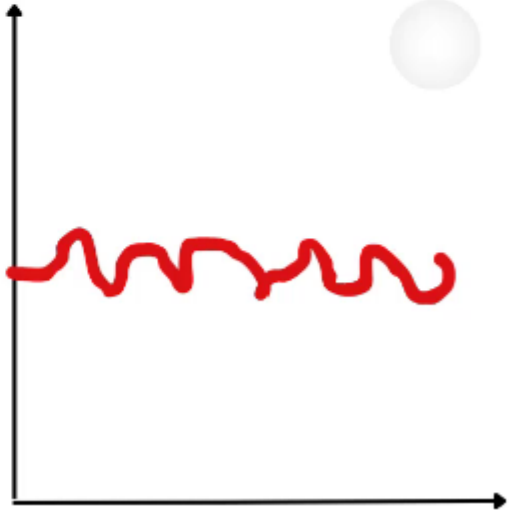
Seasonality

Seasonal cycles



Error

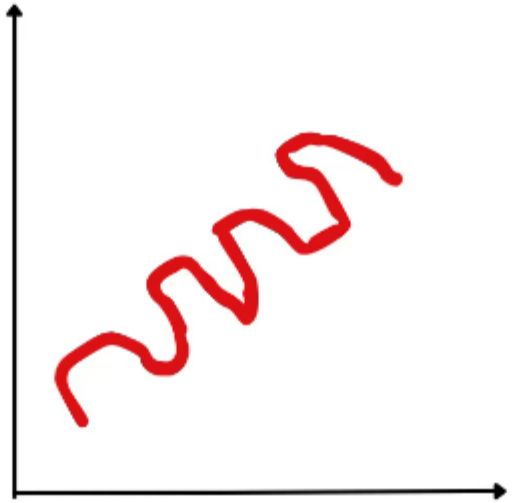
What is not explained



There are two types of seasonality:

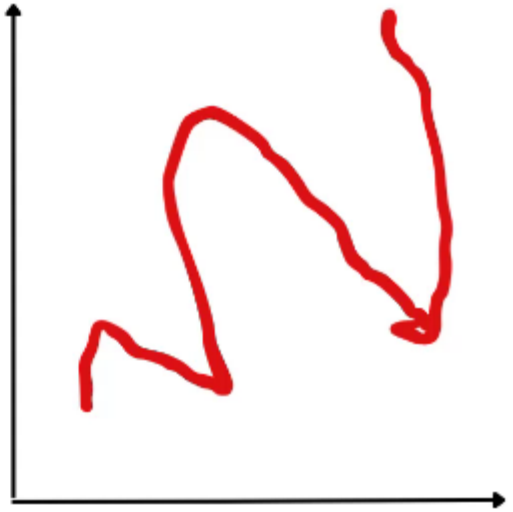
Additive

Seasonal cycles are constant in value



Multiplicative

Seasonal cycles are proportional to the trend



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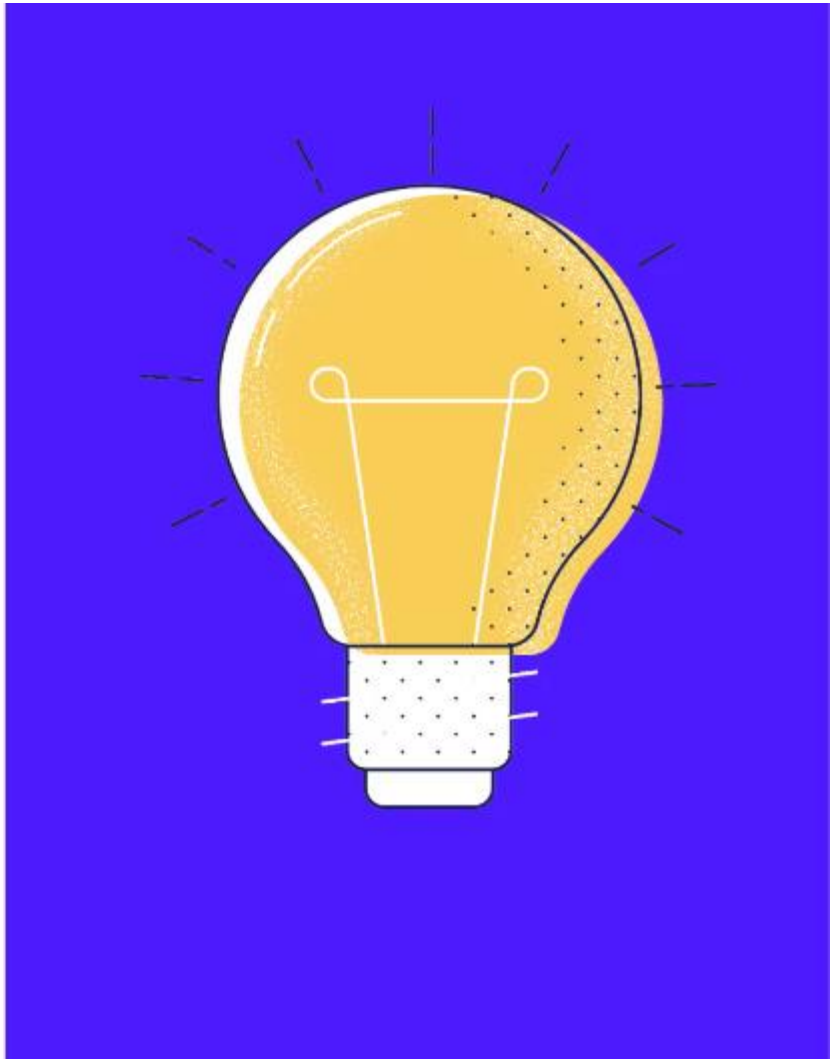
Understanding the seasonal cycles provides insights for the time series



How to identify the seasonality type?

Unfortunately, there is not a statistical test to determine the seasonality type

Option 1: Data Visualization

Option 2: Model Performance

We will try both options

[CODE DEMO]

01. What is the main purpose of applying a seasonal decomposition to a time series before modeling?

A. To reduce the dimensionality of the dataset for principal component analysis
B. To separate the series into trend, seasonal, and residual components
C. To remove autocorrelation completely
D. To convert non-stationary data into strictly white noise

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02. When deciding between an additive versus a multiplicative seasonal model, which rule of thumb is most appropriate?

A. Always use multiplicative when data are in percentages
B. Use additive if the seasonal pattern length is <= 12 periods
C. Choose additive if the amplitude of seasonal swings stays roughly constant over time
D. Pick the form that gives a higher R-squared in a linear regressions

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Thank you very much for listening.