Seasonality testing

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This code performs time series decomposition using the seasonal decomposition of time series (STL) method and generates plots of the decomposed components.

1 Prerequisites

- pandas
- statsmodels
- matplotlib
- seaborn

2 Usage

1. Place the data file (`traffic.csv`) in the same directory as the code.
2. Run the code to perform time series decomposition and generate plots.

3 Code Explanation

- The code begins by importing the necessary libraries (`pandas`, `statsmodels`, `matplotlib`, `seaborn`) and setting the default style to `seaborn`.
- The data is loaded from the `traffic.csv` file using `pandas`. The `DateTime` column is parsed as a datetime type and set as the index of the dataframe.
- The code then performs time series decomposition on the first 300 rows of the data using the seasonal decomposition of time series (STL) method. The decomposition is done with an assumed hourly frequency and a period of 24. This decomposition allows to track the seasonality of the 15 minutes increments present in the data.

- The decomposed components (observed, trend, seasonal, and residual) are plotted using `matplotlib` and `seaborn`. The plots are organized in a 4x1 grid.
- The same decomposition process is repeated for the data resampled to monthly frequency with a period of 6. it helps to understand if the monthly prediction is a plausible option.

4 Result Interpretation

The code generates plots that help visualize the decomposition of the time series into its components (observed, trend, seasonal, and residual). By examining these plots, you can gain insights into the underlying patterns and trends in the data.

The observed component represents the original time series without any decomposition. The trend component captures the long-term movement or direction of the data. The seasonal component represents the repetitive patterns or cycles in the data. The residual component contains the random or unpredictable fluctuations that cannot be explained by the trend or seasonal patterns.