**SubQuestion a.**

There are missing dates in the monthly data set. The missing dates are added to the dataset and the Order column of the missing dates (and also already existing NaN values in the Order column) are filled with 0.

The original data set is also aggregated at a quarterly level. If the data doesn’t contain any month of a quarter, then that quarter is assumed to be NaN. If data has at least a month in a quarter, then the Order at that quarter is the sum of the Orders in all existing months within that quarter. The missing quarters then are filled with the previous quarter’s values.

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**SubQuestion b.**

The missing data is handled in subquestion a. However, here is a separate function that handles the missing data.

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**SubQuestion c.**

Some products have dates that go beyond August 2022. Those data points are discarded.

The trend is analyzed in three ways:

1. Rolling average of 6 months or 3 quarters is calculated
2. A regression line is fitted
3. Trend component of STL decomposition is analyzed

Seasonality is analyzed using the following techniques:

1. P/ACF plots
2. Seasonal component of STL decomposition

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Submodel | Trend | Seasonality | High Sell | Low Sell |
| 7\_CELSIUS\_C740 | Decreasing |  |  |  |
| 7\_CELSIUS\_C780 |  |  |  |  |
| 7\_CELSIUS\_H5511 |  |  |  |  |
| 7\_CELSIUS\_H7510 |  |  |  |  |
| 7\_CELSIUS\_H760 |  |  |  |  |
| 7\_CELSIUS\_H760\_SAG |  |  |  |  |
| 7\_CELSIUS\_H770 |  |  |  |  |
| 7\_CELSIUS\_H780 |  |  |  |  |
| 7\_CELSIUS\_H970 |  |  |  |  |
| 7\_CELSIUS\_H970\_I7 |  |  |  |  |
| 7\_CELSIUS\_H980 |  |  |  |  |
| 7\_CELSIUS\_J5010 |  |  |  |  |
| 7\_CELSIUS\_J550 |  |  |  |  |
| 7\_CELSIUS\_J550\_BMI |  |  |  |  |
| 7\_CELSIUS\_J580 |  |  |  |  |
| 7\_CELSIUS\_M7010 |  |  |  |  |
| 7\_CELSIUS\_M7010X |  |  |  |  |
| 7\_CELSIUS\_M720 |  |  |  |  |
| 7\_CELSIUS\_M740 |  |  |  |  |
| 7\_CELSIUS\_M770 |  |  |  |  |
| 7\_ESPR\_A525\_L |  |  |  |  |
| 7\_BB\_E\_1640\_P201 |  |  |  |  |