In order to identify patterns in our time series data and forecast future values, we will use the Time Series Decomposition tool in EngineRoom.

In this tutorial, we will start by analyzing the monthly sales at MoreClothes from January 2017 to August 2025. We will use the model output to forecast the sales for the remaining 4 months of 2025.

To get to the tool, we will go to Analyze > Time Series Analysis > Decomposition

Once in the tool, we will go to our data source and drag our time series variable labeled “Sales” over to our “Measurement Variable” drop zone.

The tool will automatically generate a recommended season length based on the statistical tests listed. As our data is monthly and sales cycle naturally every year, the recommendation makes practical sense, so we will proceed with the season length of 12 by clicking continue.

Next, the tool will recommend the best model type and composition for our study. Here, our recommendation is an additive model with a trend component included. After fitting our model, we will try the next best recommendation if we are not satisfied with the recommended model’s fit.

In order to forecast the next 4 months of sales data, we will enter “4” into the number of points to forecast. Now that our model options are all complete, we will select “continue” to get to the output.

The trend chart in our output shows that our additive with trend model has a good fit to our data with little error, and it shows our 4 forecasted points at the end. If we scroll down, we will see our table of forecasts that we can use for reporting out the predicted sales.

Close out of the study to start our second example.

Next, we will create a model to understand the seasonality and trend of Wittrock Farms’ quarterly crop yield from the last 11 years.

Again, we start by opening the Decomposition tool and dragging our time series variable, in this case “Crop Yield”, over to the “Measurement Variable” dropzone.

Our recommended season length here is 4. This again makes practical sense, as we are reporting quarterly yields. We will keep this recommendation and select “continue”.

Our recommended model type is multiplicative with a trend component. We will keep this recommendation and leave the “Number of Points to Forecast” blank because we do not yet need to forecast yield, we just want to understand the change over time. Now we will select “continue” to get our output.

We again see a good fitting model to our data. The multiplicative model with trend best describes the year over year growth Wittrock Farms has seen by accounting for the proportional growth by period. The larger the initial yield for a quarter, the more growth it saw the next year. This is different from the additive model we saw in our sales data which saw constant growth for all months of the year regardless of previous year's sales.

We can see how the trend and seasonality indices impact our data on the "component analysis" tab of our output, as well as look at the residuals for our model in the "Seasonally Adjusted and Detrended" trend chart.

We can also visualize our seasonal indices and variation seen across periods in the "seasonal analysis" tab.

For more information on these examples and on Time Series Decomposition, please visit the help page linked here.