Suppose that quarterly data on some time series variable exhibits obvious seasonality, although the seasonal pattern varies somewhat from year to year. Which method do you believe will work best: Winters’ method or regression with dummy variables for quarters (and possibly a time variable for trend)? Why?

Step 1:

Consider a time series variable with quarterly data that clearly shows seasonality, while the seasonal pattern varies a little from year to year.

The Winter's exponential smoothing model has a seasonal index smoothing constant (Y) that can be predefined based on previous seasonal variations, but in our scenario, the seasonal pattern varies from year to year, making it impossible for a constant smoothing constant to accurately predict the yearly variations in seasonal indices and possibly failing to perform as intended.

Step 2:

On the other hand, the use of dummy variables for the quarters and estimating the coefcients of the dummy variables according on the data at hand makes this model more adaptable for estimating seasonally with regression. As a result, utilising regression with dummy variables for the quarter may be preferred to the winter method.

Step 3:

Despite being straightforward, Holt winter forecasting is very powerful.

By locating the central value, then adding the effect of slop and seasonally, it may solve a great deal of intricate seasonal patterns.

The secret is to give it the proper settings. Although this is a challenging task, we have discovered that numerical optimization can quickly select good values. This solution is important for our needs because it is easy to construct and comprehend.