Example of Trend-Adjusted Exponential Smoothing

For the data given below, generate a forecast for period 11 through 13 using trend-adjusted exponential smoothing. Use al = 0.4 and $b\epsilon$ = 0.3

Period	1	2	3	4	5	6	7	8	9	10
Data values	500	524	520	528	540	542	558	550	570	575

Solution: To use trend adjusted exponential smoothing, we first need an initial estimate of the trend. This initial estimate can be obtained by calculating the net change from the three changes in the data that occurred through the first four periods.

- Initial Trend Estimate = (528 - 500)/3 = 28/3 = 9.33

Using this initial trend estimate and the actual data value for period 4, we compute an initial forecast for period 5.

- Initial Forecast for period 5 = 528 + 9.33 = 537.33.

The forecasts and the associated calculations are shown in the table below.

Table 2.1 Forecast Calculations for the Trend-Adjusted Exponential Smoothing Example

Period	Actual	$S_{t-1} + T_{t-1} = TAF_t$	$TAF_t + 0.3(A_t - TAF_t) = S_t$	$T_{t-1} + 0.2(TAF_t - TAF_{t-1} - T_{t-1}) = T_t$
5	540	528 + 9.33 = 537.33	537.33 + 0.3(540 - 537.33) = 538.13	9.33
6	542	538.13 + 9.33 = 547.46	547.46 + 0.3(542 - 547.46) = 545.82	9.33 + 0.2(547.46 - 537.33 - 9.33) = 9.49
7	558	545.82 + 9.49 = 555.31	555.31 + 0.3(558 - 555.31) = 556.12	9.49 + 0.2(555.31 - 547.46 - 9.49) = 9.16
8	550	556.12 + 9.16 = 565.28	565.28 + 0.3(550 - 565.28) = 560.70	9.16 + 0.2(565.28 - 555.31 - 9.16) = 9.32
9	570	560.70 + 9.32 = 570.02	570.02 + 0.3(570 - 570.02) = 570.01	9.32 + 0.2(570.02 - 565.28 - 9.32) = 8.41
10	575	570.01 + 8.41 = 578.42	578.42 + 0.3(575 - 578.42) = 577.40	8.41 + 0.2(578.42 - 570.02 - 8.41) = 8.41
11		577.40 + 8.41 = 585.81		

The forecast for period 11 is 585.81.