

- Using Excel, we compute the Holt's trend corrected smoothing on the Thermostat Sales data based on a regression of the first 13 weeks of the data. The following results are what come from our initial analysis:

	Value
$\alpha$	0.1
$\beta$	0.1
SSE	46329.608
MSE	926.5921
s	30.439976
MAD	27.58347
MAPE	10.929265

- We then use a solver to compute the values of alpha and beta that minimize SSE. These values are computed to be,

$$\alpha = 0.242617, \quad \beta = 0.098163$$

They result in a value of  $SSE = 38897.65435$ .

- We now use the computed values of  $l_{52}$  and  $b_{52}$  to find the point forecasts for  $y_{53}$ ,  $y_{54}$  as well as their 90% intervals.

$$y_{53} = l_{52} + b_{52} = 316.0897 + 4.54049 = 320.6302$$

$$y_{54} = l_{52} + 2b_{52} = 316.0897 + 2 * 4.54049 = 325.1707$$

Our intervals are then,

$$[y_{53} \pm z^* s] = [320.6302 - 1.645 * 27.8918, 320.6302 + 1.645 * 27.8918] = [274.74819, 366.5122]$$

$$[y_{54} \pm z^* s \sqrt{1 + \alpha^2(1 + \beta)^2}] = [325.1707 - 1.645 * 27.8918 * 1.03488, 325.1707 + 1.645 * 27.8918 * 1.03488] = [277.688091, 372.65332]$$