12.5.1

$n=17 \quad \hat{\beta}_0 = 12.08 \quad \hat{\beta}_1 = 34.60 \quad \hat{\sigma}^2 = 1765 \quad S_{xx} = 1096 \quad \bar{x} = 53.2$

$1-\alpha = .05$

$\alpha = .05$

~~$t_{\frac{\alpha}{2}, n-2} = t = .025, 15$~~

$t_{.025, 12} = 2.131$

$y_{|40} \in \left(12.08 + (34.60 \times 40) \pm 2.131 \sqrt{17.65 \times \left(\frac{18}{17} + \frac{(40-53.2)}{1096} \right)} \right)$

$y_{|40} \in (1386, 1406)$

12.4.10

x val = 35 confidence lvl = 99%.

Sample size, n=7 Degrees of freedom, df = n-2 = 5

$t_{\alpha/2} = 4.032$

$\bar{x} = 34.40 \quad \Sigma(x-\bar{x})^2 = S_{xx} \; 26.92$

SE = 1.0085

Predicted Y at X = 35 is $\hat{y} = 144.5076 + -2.1142 * 35 = 70.4142$

standard error = $se \sqrt{(1/n + (x-\bar{x})^2 / S_{xx})} = .40$

margin of error, E = t* Std error = $t^* \hat{\sigma}_{\hat{y}} = 4.032 *$

3986 = 1.607

Confidence Lower limit = $\hat{y} + E = 70.414 - 1.607 = 68.81$

Confidence Upper limit = $\hat{y} + E = 70.414 + 1.607 = 72.02$

12.4.2

Same as 12.5.1