

14.6: using the estimated regression equation for estimation and prediction.

→ Point estimation:

$$\hat{y} = b_0 + b_1 x$$

→ Interval Estimation:

1. Confidence interval for the mean value of  $y$ .

$$(1-\alpha) \text{ CI for } E(y_p) = \hat{y}_p \pm Sb_{\hat{y}} \sqrt{\frac{1}{n} + \frac{(x_p - \bar{x})^2}{\sum (x_i - \bar{x})^2}}$$

Where  $\hat{y}_p = b_0 + b_1 x_p$  and  $df = n - 2$ .

2. Prediction Interval for  $y$

$$(1-\alpha) \text{ PI for } y_p = \hat{y}_p \pm Sb_{\hat{y}} \sqrt{1 + \frac{1}{n} + \frac{(x_p - \bar{x})^2}{\sum (x_i - \bar{x})^2}}$$

Where  $\hat{y}_p = b_0 + b_1 x_p$  and  $df = n - 2$ .