Disc. Sec. week of 5–9 Jun 2017

DS 9 #1 p. R-(24)

$\hat{r}$ is

AMS 7 5 Jun 17 (1)

just like wing length / tail length from class: correlation & regression

$r = -0.9904$

$°F = \frac{9}{5}(°C) + 32°$

$$r = \frac{1}{n} \sum_{i=1}^{n} \left(\frac{x_i - \bar{x}}{s_x^*} \right) \cdot \left(\frac{y_i - \bar{y}}{s_y^*} \right)$$

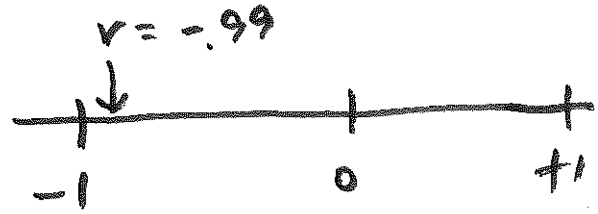
(b) r = same for temp. in °F as in °C

$$\hat{SE}(r) = \sqrt{\frac{1-r^2}{n-2}}$$

formula (16), p. R-(25)

$$= \sqrt{\frac{1-(-.9904)^2}{8-2}}$$

$= 0.056$



n = 8 small

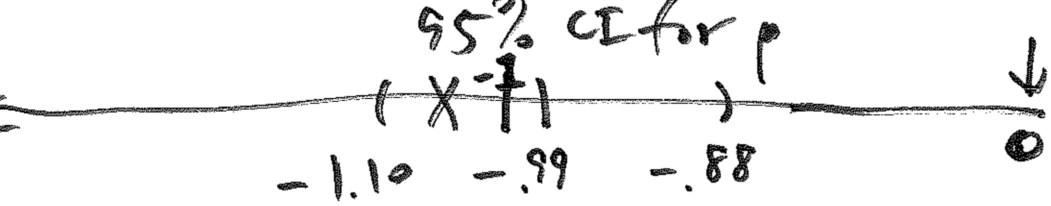
approx. 95% CI:

$r \pm 2\,\hat{SE}(r)$

$-.9904 \pm 2(.056)$

(−1, −.88) is approx. 95% CI

95% CI for ρ



since 0 not in 95% CI, diff. between r = −.99 & $\rho_0 = 0$ (is) (highly) statis. sig. & r is (highly) pract. sig also

regression line for predicting y = oxygen from x = temperature

$$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 \cdot x$$

$$\hat{\beta}_1 = r \frac{s_y}{s_x}$$

formula (17), p. R-(25)

$$= (-.9904) \frac{1.1285 \text{ ml/g/hr}}{12.74 \text{ °C}}$$

$$= -.0877 \text{ ml/g/hr/°C}$$

$$\hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \bar{x}$$

(formula (21), p. R-(25))

$$= 3.625 \text{ ml/g/hr} - (-.0877)(-1.75)$$

ml/g/hr / °C (°C)

$$= 3.47 \text{ ml/g/hr}$$

reg. line for pred ox. from temp: $\hat{y} = 3.47 - .0877x$

(c)(iii) predict y when $x = -15°C$ & attach a SE to the prediction

$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x = 3.47 - .0877(-15)$

$= 4.79$ ml/g/h

$\widehat{SE}(\hat{y}) = s_y \sqrt{1-r^2}\sqrt{\frac{n-1}{n-2}}$

formula (24), p. R-26

$= 1.1285\sqrt{1-(.9904)^2}\cdot\sqrt{\frac{7}{6}}$

$= 0.17$ ml/g/h

$=$ RMSE