STAT 3610 HW5 S2011 Maghsoodloo

Exercise 64/p. 494 (a, 8 points)

$n = 26,\ S_{xx} = 3756.96,\ S_{yy} = 465.34,\ S_{xy} = -757.64231$

$r = \hat{\rho} = -0.57301;\ \frac{1}{2}\ln\frac{1+r}{1-r} = -0.6520$

$Pr.\left(\frac{1}{2}\ln\frac{1+r}{1-r} \geq \frac{1}{2}\ln\frac{1+\rho}{1-\rho} - 1.28155/\sqrt{23}\right) = 0.90$

$se\left(\frac{1}{2}\ln\frac{1+r}{1-r}\right) = 1/\sqrt{23} = 0.2085144$

$\rho_U = \tanh(-0.6520 + 0.267222) = -0.36685 \rightarrow$

$-1 < \rho \leq -0.36685,\ 1-\alpha = 0.90.$

(b, 5 points) $\alpha = 0.10;\ \frac{1}{2}\ln\frac{1-.50}{1+.50} = \tanh^{-1}(-.50)$

$H_0: \rho = -0.50,\ H_1: \rho < -0.50 \qquad = -0.54931$

$A_L = -0.54931 - .267222 = -0.81653$

$\frac{1}{2}\ln\frac{1+r}{1-r} = \tanh^{-1}(-0.57301) = -0.6520 > A_L \rightarrow$

Do not reject H_0 at the 10% LOS.

(c & d, 4 points) $r^2 = 0.32834 \rightarrow 32.834\%$ of variation in y is explained by x and vice versa.

(e, 3 points) $z_0 = \frac{-0.6520 + 0.54931}{0.2085144} = -0.492454$

$\hat{\alpha} = P\text{-value} = Pr(Z \leq z_0) = 0.31120.$