Section 6d: Practice Problems

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1. Recall equation of regression line relating estimated mean hourly wages (U.S. $, 1985) to years of education: from Stata

\[ \hat{y} = -0.75 + 0.75x \]

This regression is based on a random sample of 534 U.S. workers in 1985. The standard error estimate of the slope, 
\[ SE(\hat{\beta}_1) = 0.08 \]

a) Estimate a 95% CI for the true population slope relating hourly wages to years of education

b) What is the estimated 95% confidence interval for the mean difference in hourly wages (in year, 1985) for persons with 16 years of education versus 12 years of education?
Example: Arm Circumference and Sex

2. Recall the regression relating arm circumference to child’s sex for the random sample of 150 Nepali children less than 12 months old

\[ \hat{y} = 12.5 + -0.13x \]

- The estimated standard error of the slope estimate is \( SE(\hat{\beta}_1) = 0.24 \)

- In this example, \( x \) is the binary variable for sex, coded as a 1 for female children, and 0 for male children. Suppose \( x \) was coded as 1 for male children and 0 for female children.

a) What would the resulting 95% confidence interval for the true population slope be?