

# Data Analysis Exercises for Chapter 6: *Applied Regression Analysis, Generalized Linear Models, and Related Methods*, Third Edition (Sage, 2016)

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**Exercise D6.1** # Recall Exercise D5.1, in which a simple regression of acres/gardener on consumers/gardener was calculated for five observations drawn from Sahlin's data on agricultural production in a primitive community. Assuming that the observations were independently sampled, find the standard error  $SE(B)$  of the slope coefficient, and calculate a 90-percent confidence interval for the population slope  $\beta$ .

**Exercise D6.2** In Exercise D5.2 you calculated a simple regression of acres/gardener on consumers/gardener for the 20 households of Mazulu village. Find the standard errors of the least-squares intercept and slope. Can we conclude that the population slope is greater than zero? Can we conclude that the intercept is greater than zero? Repeat these computations omitting the fourth household.

**Exercise D6.3** Construct 95-percent confidence intervals for  $\alpha$  and  $\beta$  in each of the least-squares simple-regression analyses that you performed in Exercise D5.3.

**Exercise D6.4** # Recall Exercise D5.4, in which moral integration was regressed on ethnic heterogeneity and geographic mobility for nine cities in the southeast, selected from among Angell's 43 U.S. cities.

- (a) Assuming independently distributed errors, find the standard errors of the slope coefficients for heterogeneity and mobility,  $SE(B_1)$  and  $SE(B_2)$ . Separately test the null hypotheses  $H_0: \beta_1 = 0$  and  $H_0: \beta_2 = 0$ .
- (b) Construct an analysis-of-variance table for the regression, testing the omnibus null hypothesis,  $H_0: \beta_1 = \beta_2 = 0$ .

**Exercise D6.5** Compute coefficient standard errors and 95-percent confidence intervals for the coefficients in the multiple regression that you performed in Exercise D5.5. Construct the analysis of variance table for the regression, and test the omnibus null hypothesis that all  $\beta$ 's are zero. Compute an incremental  $F$ -test of the null hypothesis  $H_0: \beta_1 = 0$ , and verify that the  $F$ -statistic for this test is equal to the square of the  $t$ -value obtained when  $B_1$  is divided by  $SE(B_1)$ .