FINM3123 Introduction to Econometrics

Chapter 2 Exercises

1. The following table contains the ACT scores and the GPA for eight college students. GPA is based on a four-point scale and has been rounded to one digit after the decimal.

Student	GPA	ACT
1	2.8	21
2	3.4	24
3	3.0	26
4	3.5	27
5	3.6	29
6	3.0	25
7	2.7	25
8	3.7	30

   i) Estimate the relationship between *GPA* and *ACT* using OLS; that is, obtain the intercept and slope estimates in the equation

$$\widehat{GPA} = \widehat{\beta}_0 + \widehat{\beta}_1 ACT.$$

   ii) Compute the fitted values and residuals for each observation, and verify that the residuals (approximately) sum to zero.

   iii) What is the predicted value of *GPA* when $ACT = 20$?

   iv) How much of the variation in *GPA* for these eight students is explained by *ACT*? Explain.

2. The data set in CEOSAL2.RData (or CEOSAL2.xls) contains information on chief executive officers for U.S. corporations. The variable *salary* is annual compensation, in thousands of dollars, and *ceoten* is prior number of years as company CEO.

   i) Find the average salary and the average CEO tenure in the sample.

   ii) How many CEOs are in their first year as CEO (that is, *ceoten* = 0)? What is the longest tenure as a CEO?

   iii) Estimate the simple regression model

$$\log(salary) = \beta_0 + \beta_1 ceoten + u,$$

   and report your results in the usual form. What is the (approximate) predicted

percentage increase in salary given one more year as a CEO?

3. Use the data in SLEEP75.RData (or SLEEP75.xls) to study whether there is a tradeoff between the time spent sleeping per week and the time spent in paid work. We could use either variable as the dependent variable. For concreteness, estimate the model

$$sleep = \beta_0 + \beta_1 totwrk + u$$

where *sleep* is minutes spent sleeping at night per week and *totwrk* is total minutes worked during the week.

   i) Report your results in equation form along with the number of observations and R^2. What does the intercept in this equation mean?

   ii) If *totwrk* increases by 2 hours, by how much is *sleep* estimated to fall? Do y ou find this to be a large effect?