Chapter 6
Linear Regression with Multiple Regressors

6.1. By equation (6.15) in the text, we know

$$\bar{R}^2 = 1 - \frac{n-1}{n-k-1}(1-R^2).$$

Thus, that values of $\bar{R}^2$ are 0.175, 0.189, and 0.193 for columns (1)–(3).

6.3. (a) On average, a worker earns \$0.29/hour more for each year he ages.

(b) Sally’s earnings prediction is $4.40 + 5.48 \times 1 - 2.62 \times 1 + 0.29 \times 29 = 15.67$ dollars per hour. Betsy’s earnings prediction is $4.40 + 5.48 \times 1 - 2.62 \times 1 + 0.29 \times 34 = 17.12$ dollars per hour. The difference is 1.45

6.4. (a) Workers in the Northeast earn \$0.69 more per hour than workers in the West, on average, controlling for other variables in the regression. Workers in the Northeast earn \$0.60 more per hour than workers in the West, on average, controlling for other variables in the regression. Workers in the South earn \$0.27 less than workers in the West.

(b) The regressor *West* is omitted to avoid perfect multicollinearity. If *West* is included, then the intercept can be written as a perfect linear function of the four regional regressors.

(c) The expected difference in earnings between Juanita and Jennifer is $-0.27 - 0.6 = -0.87$.

6.5. (a) \$23,400 (recall that *Price* is measured in \$1000s).

(b) In this case $\Delta BDR = 1$ and $\Delta Hsize = 100$. The resulting expected change in price is $23.4 + 0.156 \times 100 = 39.0$ thousand dollars or \$39,000.

(c) The loss is \$48,800.

(d) From the text $\bar{R}^2 = 1 - \frac{n-1}{n-k-1}(1-R^2)$, so $R^2 = 1 - \frac{n-k-1}{n-1}(1-\bar{R}^2)$, thus, $R^2 = 0.727$.