Computation of the regression coefficients, $\hat{\beta}_0$, $\hat{\beta}_1$ using the class data.

Part II of the in class exercise, asked you to compute, by hand, $\hat{\beta}_0$, $\hat{\beta}_1$ using the data you entered and calculated in Table 4. The formula for the regression coefficients I gave you in class didn’t use the “short-cut” which is the easiest way to use the data in Table 4. Below I provide the formula for $\hat{\beta}_1$ using both the short-cut and non-short-cut approaches.

First compute $\hat{\beta}_1$ using the formula.

$$\hat{\beta}_1 = \frac{\sum_{i=1}^{n} [(X_i - \bar{X})(Y_i - \bar{Y})]}{\sum_{i=1}^{n} (X_i - \bar{X})^2} = \frac{\sum X_i Y_i - \sum X_i \sum Y_i}{\sum X_i^2 - (\sum X_i)^2}$$

The last equation after the second equal sign is the short-cut version. Using either reversion to find $\hat{\beta}_1$, then plug $\hat{\beta}_1$ into the formula below to find $\hat{\beta}_0$.

$$\hat{\beta}_0 = \bar{Y} - \hat{\beta}_1 \bar{X}$$