



## Ch3 Quiz Questions

### Multiple Choice

1/1 point (graded)

Which of the following statements are true?

- ☒ In the balance vs. income \* student model plotted on slide 44, the estimate of  $\beta_3$  is negative.
- ☐ One advantage of using linear models is that the true regression function is often linear.
- ☐ If the F statistic is significant, all of the predictors have statistically significant effects.
- ☐ In a linear regression with several variables, a variable has a positive regression coefficient if and only if its correlation with the response is positive.



#### Explanation

We can see that the estimate of  $\beta_3$  is negative because the slope of the student line is smaller than the slope of the non-student line. That is, being a student diminishes the effect of income on balance.

The linear model is almost always wrong; however, it is often still useful.

The F statistic tests the null hypothesis that none of the predictors has any effect. Rejecting that null means concluding that *some* predictor has an effect, not that *all* of them do.

Positive correlation only means that the univariate regression has a positive correlation. See slide 20 for a counterexample.

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**i** Answers are displayed within the problem

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