Economics 311 — Fall 2017
Daily Problem #9 — September 29

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. reg gpoints hsgpa satv100 satm100 irdr

      Source |       SS           df       MS      Number of obs   =       614
-------------+----------------------------------   F(4, 609)       =     21.59
       Model |  54.5848954         4  13.6462238   Prob > F        =    0.0000
    Residual |   384.93942       609  .632084434   R-squared       =    0.1242
-------------+----------------------------------   Adj R-squared   =    0.1184
       Total |  439.524316       613  .717005409   Root MSE        =    .79504

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     gpoints |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       hsgpa |   .3537593   .0919229     3.85   0.000     .1732349    .5342836
     satv100 |   .0504954    .050856     0.99   0.321     -.049379    .1503697
     satm100 |   .1301921   .0513652     2.53   0.012     .0293176    .2310666
        irdr |   .2629642   .0708958     3.71   0.000     .1237343    .4021941
       _cons |    -.54605   .4460842    -1.22   0.221      -1.4221         .33
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The sample for the above regression is students who took Econ 201 between 1993 and 2002. The variables are

- gpoints = grade in Econ 201, in grade points (0 to 4)
- hsgpa = high-school grade point average
- satv100 = verbal SAT score (in 100s)
- satm100 = math SAT score (in 100s)
- irdr = inverted Admission Office "reader rating" (5 = best, 1 = worst)

The reader rating rates the applicant's overall suitability to be a Reed student. It is assigned by the admission deans based on the entire admission file, including formal credentials such as high school record and test scores as well as informal information such as essays, interviews, and recommendations.

1. Use Table B-1 on page 519 of the text to determine the appropriate critical value for a two-tailed test at the 5% significance level.

2. For each variable j (excluding the constant), use the Stata output to perform a two-tailed t test of the null hypothesis $\beta_j = 0$ in three different ways:

   a. By comparing the t statistic in the table to the critical value you looked up

   b. By looking at the p value reported in the table

   c. By examining the 95% confidence interval reported in the table

Why must all three give the same answer?

3. Recall that the coefficient on X_j in a regression measures the effect of X_j on Y holding all other regressors constant. Use the tests you did in the previous question to evaluate the following propositions, assuming (incorrectly) that the Admission Office's criterion in assigning reader ratings was predicting an applicant's success in Econ 201:

a. The Admission Office made better admission decisions than it would have by following a simple rule based on GPA and SATs.
b. The Admission Office did not give enough weight to math SAT scores in determining reader rating.
c. The Admission Office did not give enough weight to verbal SAT scores in determining reader rating.
d. The Admission Office did not give enough weight to high-school GPA in determining reader rating.