Economics 312 — Spring 2020
Daily Problem #9 — February 12

Consider the following multiple regression that you examined in the previous daily problem, with dependent variable of grade in Econ 201. The regressors are high-school GPA, verbal and math SAT scores (divided by 100 for scaling), a female dummy, and the inverted reader rating (5 is best).

```
. reg gpoints hsgpa satv100 satm100 irdr female

      Source |       SS           df       MS      Number of obs   =       405
-------------+----------------------------------   F(5, 399)       =     10.55
       Model |  35.3228503         5  7.06457005   Prob > F        =    0.0000
    Residual |  267.226928       399  .669741673   R-squared       =    0.1168
-------------+----------------------------------   Adj R-squared   =    0.1057
       Total |  302.549778       404  .748885589   Root MSE        =    .81838

------------------------------------------------------------------------------
     gpoints |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       hsgpa |   .4191427   .1283612     3.27   0.001     .1667938    .6714916
      satv100 |   .0582289   .0627942     0.93   0.354      -.06522    .1816778
      satm100 |   .1201843    .069417     1.73   0.084    -.0162845    .2566532
        irdr |   .2432813   .1022556     2.38   0.018     .0422542    .4443085
      female |  -.0027906   .0909911    -0.03   0.976    -.1816725    .1760913
       _cons |  -.6836788   .5778051    -1.18   0.237    -1.819601     .452244
------------------------------------------------------------------------------
```

1. Briefly assess whether you think that assumptions MLR.1, MLR.4, and MLR.5 are reasonable for Reed students taking Econ 201.

2. The problem of multicollinearity is discussed by Wooldridge in Section 3-4a. Without looking at the table below, would you expect problems of multicollinearity in the Reed student sample? Which set of variables do you think might be strongly correlated? What effect would this have on the results?

3. The Stata estat has a lot of options for doing post-estimation analysis. The vif option computes variance-inflation factors. Do the results in the table below confirm your suppositions in question 2? Explain.

```
. estat vif

    Variable |       VIF       1/VIF
-------------+----------------------
        irdr |      1.61    0.620452
     satm100 |      1.45    0.687565
       hsgpa |      1.44    0.693025
     satv100 |      1.28    0.781382
      female |      1.18    0.849713
-------------+----------------------
    Mean VIF |      1.39
```