Review OLS Example  
A. Colin Cameron U.C.-Davis

For this course I assume you can analyze the following data, especially the first page. If you need further details read an undergraduate econometrics text or see http://cameron.econ.ucdavis.edu/e240a/reviewbivariate.pdf

The data are on house price (in $) and size (in square feet) and other house characteristics for 29 houses sold in Central Davis in 1999.

```
. summarize /* Gives descriptive statistics */

       Variable | Obs  Mean    Std. Dev.   Min   Max
-----------------+---------------------------------------
          listpric |  29  257.8241    40.86026  199.9  386
          salepric |  29  253910.3    37390.71  204000  375000
          sqfeet |  29   1882.759    398.2721   1400  3300
          lotsize |  29    2.137931    .6930336    1     3
          bedrooms |  29    3.793103    .6750296    3
                       +---------------------------------------
          bathroom |  29   2.206897    .3411441    2     3
         mnthsold |  29    5.965517    1.679344    3     8

. regress salepric sqfeet

                  Source | SS      df     MS
-----------------+---------------------
                  Model | 2.4171e+10   1  2.4171e+10
                  Residual | 1.4975e+10  27  554633395
                  Total | 3.9146e+10  28  1.3981e+09

Number of obs = 29
F(  1,   27) = 43.58
Prob > F = 0.0000
R-squared = 0.6175
Adj R-squared = 0.6033
Root MSE = 23551

------------------------------------------------------------------------------
salepric | Coef.    Std. Err.    t    P>|t|   [95% Conf. Interval]
----------+---------------------------------------------------------------
sqfeet    |  73.77104     11.17491   6.60  0.000   50.84202   96.70006
_cons     |   115017.3    21489.36    5.35  0.000   70924.76  159109.8

1. What is the fitted relationship between house price and size?
2. What method is used to obtain this fitted relationship? Give an appropriate formula.
3. By how much does house price increase when house size increases by one square foot?
4. How well does the model explain the data? Give an appropriate statistic and an explanation of that statistic.
5. Is the relationship between house price and size statistically significant at 5 percent?
6. What model assumptions are necessary for your answer to the preceding question?
7. Test at five percent the hypothesis $H_0 : \beta_{sqfeet} = 50$ against the alternative $H_a : \beta_{sqfeet} \neq 50$. 

. regress salepric sqfeet lotsize bedrooms bathroom yearblt mnthsold

Source | SS df MS
-------------+------------------------------ F( 6, 22) = 6.83
Model | 2.5466e+10 6 4.2444e+09 Prob > F = 0.0003
Residual | 1.3679e+10 22 621790812 R-squared = 0.6506
-------------+------------------------------ Adj R-squared = 0.5552
Total | 3.9146e+10 28 1.3981e+09 Root MSE = 24936

| Coef. | Std. Err. | t | P>|t| | [95% Conf. Interval] |
|-------|-----------|---|-----|------------------|
| sqfeet | 68.36942 | 15.38947 | 4.44 | 0.000 | 36.45361 - 100.2852 |
| lotsize | 2303.221 | 7226.535 | 0.32 | 0.753 | -12683.7 17290.14 |
| bedrooms | 2685.315 | 9192.526 | 0.29 | 0.773 | -16378.82 21749.45 |
| bathroom | 6832.88 | 15721.19 | 0.43 | 0.668 | -25770.88 39436.64 |
| yearblt | 833.0386 | 7122.19 | 1.16 | 0.259 | -658.7699 2324.847 |
| mnthsold | -2088.504 | 3520.898 | -0.59 | 0.559 | -9390.399 5213.392 |
| _cons | -1527453 | 1401600 | -1.09 | 0.288 | -4434193 1379287 |

8. By how much does house price increase when house size increases by one square foot, controlling for other factors?

9. Is the relationship between house price and size statistically significant at 5 percent, after controlling for other factors?

10. Are any of the other factors statistically significant at 5 percent?

11. How well does the model explain the data?

12. Are the regressor jointly statistically significant at 5 percent?

13. Does the full model explain the data better than the model with just sale price as a regressor?