240A: Review OLS Example

For this class I assume you can analyze the following data, especially the first page.
If you can't then you should see me after class.
And 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          6
-------------+--------------------------------------------------------
    bathroom |        29    2.206897    .3411441          2          3
     yearblt |        29    1962.586    7.118975       1948       1976
    mnthsold |        29    5.965517    1.679344          3          8


. regress salepric sqfeet

      Source |       SS       df       MS              Number of obs =      29
-------------+------------------------------           F(  1,    27) =   43.58
       Model |  2.4171e+10     1  2.4171e+10           Prob > F      =  0.0000
    Residual |  1.4975e+10    27   554633395           R-squared     =  0.6175
-------------+------------------------------           Adj R-squared =  0.6033
       Total |  3.9146e+10    28  1.3981e+09           Root MSE      =   23551

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    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 $H_a : \beta_{sqfeet} \neq 50$.

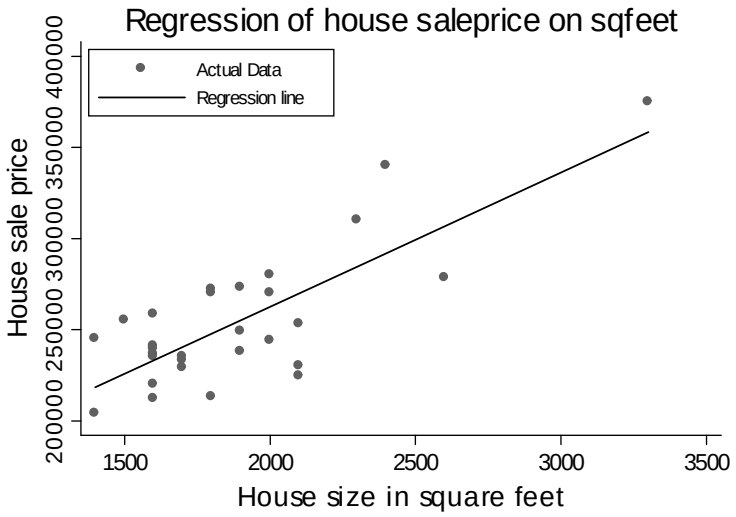

Figure 1 Regression of house sale price on size

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. regress salepric sqfeet lotsize bedrooms bathroom yearblt mnthsold

      Source |       SS       df       MS              Number of obs =      29
-------------+------------------------------           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

------------------------------------------------------------------------------
    salepric |      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   719.3345     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?