# Economics 311 — Fall 2017
# Daily Problem(s) #13 — October 13

1. Show the slope $\frac{\Delta Y}{\Delta X}$ and the elasticity $\frac{\Delta Y}{\Delta X}\frac{X}{Y}$ for the given functional forms:

   a. $Y = \beta_0 + \beta_1 X + \varepsilon$

   b. $\ln Y = \beta_0 + \beta_1 \ln X + \varepsilon$

   c. $\ln Y = \beta_0 + \beta_1 X + \varepsilon$

(*Note: A helpful property of derivatives tells us that* $\Delta \ln Y = \Delta Y / Y$)

2. Suppose that our model is $eval = \beta_0 + \beta_{female} female + \beta_1 beauty + \beta_{1,female} female \times beauty + \varepsilon$. The relevant regression output is

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. gen femalexbeauty=female*beauty

. regress eval female beauty femalexbeauty

      Source |       SS           df       MS      Number of obs   =       463
-------------+----------------------------------   F(3, 459)       =     11.97
       Model |  10.3209875         3  3.44032917   Prob > F        =    0.0000
    Residual |  131.917633       459   .28740225   R-squared       =    0.0726
-------------+----------------------------------   Adj R-squared   =    0.0665
       Total |   142.23862       462  .307875801   Root MSE        =     .5361

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        eval |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      female |  -.1950969   .0508873    -3.83   0.000    -.2950979   -.0950959
      beauty |   .2002743    .043333     4.62   0.000     .1151186      .28543
femalexbeauty |  -.1126579    .063975    -1.76   0.079    -.2383781    .0130624
       _cons |   4.085949   .0329515   124.00   0.000     4.021195    4.150704
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   a. What is the equation for males (where *female* = 0)?

   b. What is the equation for females (where *female* = 1)?

   c. What are the intercepts of the male and female equations?

   d. What are the slopes of the male and female equations?

   e. Test the hypothesis that the effect of *beauty* on *eval* is the same for males and females?