Economics 312 Spring 2014
Daily Problem #15 February 24

The HGL data set pizza4.dta is described by the following definition file:

```
Obs:   40 individuals

pizza        annual pizza expenditure, $
female       =1 if female
hs           =1 if highest degree received is high school diploma
college      =1 if highest degree received is a college diploma
grad         =1 if highest degree received is a post graduate degree
income       annual income in thousands of dollars
age          age in years
```

```
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
       pizza |        40      191.55    155.8806          0        590
      female |        40        .525    .5057363          0          1
          hs |        40        .375    .4902903          0          1
     college |        40        .375    .4902903          0          1
        grad |        40        .075    .2667468          0          1
-------------+--------------------------------------------------------
      income |        40     55.8025    51.16614        7.8      288.6
         age |        40      33.475    10.25317         18         55
```

The variable fem_inc is the product female × income:

```
gen fem_inc=female*income
```

Consider the following regression:

```
. reg pizza female income age fem_inc

      Source |       SS       df       MS              Number of obs =      40
-------------+------------------------------           F(  4,    35) =   24.35
       Model |  697127.141     4  174281.785           Prob > F      =  0.0000
    Residual |  250524.759    35  7157.85025           R-squared     =  0.7356
-------------+------------------------------           Adj R-squared =  0.7054
       Total |    947651.9    39  24298.7667           Root MSE      =  84.604

------------------------------------------------------------------------------
       pizza |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      female |  -128.7496   42.28031    -3.05   0.004    -214.5832   -42.91606
      income |   2.636669   .5123064     5.15   0.000     1.596632    3.676706
         age |  -8.272247    1.49879    -5.52   0.000    -11.31495   -5.229542
     fem_inc |  -1.095241    .581824    -1.88   0.068    -2.276407    .0859241
       _cons |   420.4974   54.26929     7.75   0.000     310.3249    530.6699
------------------------------------------------------------------------------
```

The estimated covariance matrix of the coefficients from this regression is:

	female	income	age	fem_inc	_cons
female	1787.6244				
income	13.491083	.26245784			
age	.74684932	-.2299959	2.2463713		
fem_inc	-19.009203	-.24173923	.02763713	.33851911	
_cons	-1168.352	-7.060772	-63.55174	12.785672	2945.1553

1. How much of a $1000 increase in income do we estimate that a male spends on pizza?

2. How much of a $1000 increase in income do we estimate that a female spends on pizza?

3. Is the difference between these values statistically significant?

4. What is our estimate of the difference between pizza expenditures between a male and female of the same age each with $20,000 of income? Is this difference statistically significant?