Stata Textbook Examples
Introductory Econometrics: A Modern Approach by Jeffrey M. Wooldridge (1st & 2d eds.)
Chapter 3 - Multiple Regression Analysis: Estimation

Example 3.1: Determinants of College GPA

use http://fmwww.bc.edu/ec-p/data/wooldridge/GPA1

summ ACT

```
Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+--------------------------------------------------------
     ACT |     141    24.15603    2.844252         16         33
```

reg colGPA hsGPA ACT

```
  Source |       SS       df       MS              Number of obs =     141
---------+------------------------------           F(  2,   138) =   14.78
   Model |  3.42365506     2  1.71182753           Prob > F      =  0.0000
Residual |  15.9824444   138  .115814814           R-squared     =  0.1764
---------+------------------------------           Adj R-squared =  0.1645
   Total |  19.4060994   140  .138614996           Root MSE      =  .34032

------------------------------------------------------------------------------
  colGPA |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
   hsGPA |   .4534559   .0958129      4.733   0.000       .2640047    .6429071
     ACT |    .009426   .0107772      0.875   0.383      -.0118838    .0307358
   _cons |   1.286328   .3408221      3.774   0.000        .612419    1.960237
------------------------------------------------------------------------------
```

reg colGPA ACT

```
  Source |       SS       df       MS              Number of obs =     141
---------+------------------------------           F(  1,   139) =    6.21
   Model |  .829558811     1  .829558811           Prob > F      =  0.0139
Residual |  18.5765406   139  .133644177           R-squared     =  0.0427
---------+------------------------------           Adj R-squared =  0.0359
   Total |  19.4060994   140  .138614996           Root MSE      =  .36557

------------------------------------------------------------------------------
  colGPA |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
     ACT |    .027064   .0108628      2.491   0.014       .0055862    .0485417
   _cons |   2.402979   .2642027      9.095   0.000       1.880604    2.925355
------------------------------------------------------------------------------
```

Example 3.2: Hourly Wage Equation

use http://fmwww.bc.edu/ec-p/data/wooldridge/WAGE1

reg lwage educ exper tenure

```
  Source |       SS       df       MS              Number of obs =     526
---------+------------------------------           F(  3,   522) =   80.39
   Model |  46.8741805     3  15.6247268           Prob > F      =  0.0000
Residual |  101.455581   522  .194359351           R-squared     =  0.3160
---------+------------------------------           Adj R-squared =  0.3121
   Total |  148.329762   525   .28253288           Root MSE      =  .44086

------------------------------------------------------------------------------
   lwage |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
    educ |    .092029   .0073299     12.555   0.000       .0776292    .1064288
   exper |   .0041211   .0017233      2.391   0.017       .0007357    .0075065
  tenure |   .0220672   .0030936      7.133   0.000       .0159897    .0281448
   _cons |   .2843595   .1041904      2.729   0.007       .0796755    .4890435
------------------------------------------------------------------------------
```

Example 3.3: Participation in 401(K) Pension Plan

use http://fmwww.bc.edu/ec-p/data/wooldridge/401K

summ prate mrate age

```
    Variable |     Obs        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------
       prate |    1534    87.36291   16.71654         3        100
       mrate |    1534    .7315124   .7795393       .01       4.91
         age |    1534    13.18123   9.171114         4         51
```

reg prate mrate age

```
      Source |       SS       df       MS              Number of obs =    1534
-------------+------------------------------           F(  2,  1531) =   77.79
       Model |  39517.1118     2  19758.5559           Prob > F      =  0.0000
    Residual |  388868.428  1531   253.99636           R-squared     =  0.0922
-------------+------------------------------           Adj R-squared =  0.0911
       Total |  428385.539  1533  279.442622           Root MSE      =  15.937
```

```
------------------------------------------------------------------------------
       prate |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       mrate |   5.521289   .5258844    10.50   0.000     4.489759    6.552819
         age |   .2431466   .0446999     5.44   0.000     .1554671     .330826
       _cons |   80.11905   .7790208   102.85   0.000     78.59099    81.64711
------------------------------------------------------------------------------
```

reg prate mrate

```
      Source |       SS       df       MS              Number of obs =    1534
-------------+------------------------------           F(  1,  1532) =  123.68
       Model |  32001.7271     1  32001.7271           Prob > F      =  0.0000
    Residual |  396383.812  1532   258.73617           R-squared     =  0.0747
-------------+------------------------------           Adj R-squared =  0.0741
       Total |  428385.539  1533  279.442622           Root MSE      =  16.085

------------------------------------------------------------------------------
       prate |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       mrate |   5.861079   .5270107    11.12   0.000      4.82734    6.894818
       _cons |   83.07546   .5632844   147.48   0.000     81.97057    84.18035
------------------------------------------------------------------------------
```

Example 3.4: Determinants of College GPA

use http://fmwww.bc.edu/ec-p/data/wooldridge/GPA1

reg colGPA hsGPA ACT

```
  Source |       SS       df       MS              Number of obs =     141
---------+------------------------------           F(  2,   138) =   14.78
   Model |  3.42365506     2  1.71182753           Prob > F      =  0.0000
Residual |  15.9824444   138  .115814814           R-squared     =  0.1764
---------+------------------------------           Adj R-squared =  0.1645
   Total |  19.4060994   140  .138614996           Root MSE      =  .34032

------------------------------------------------------------------------------
  colGPA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------+--------------------------------------------------------------------
   hsGPA |   .4534559   .0958129     4.733   0.000      .2640047    .6429071
     ACT |    .009426   .0107772     0.875   0.383     -.0118838    .0307358
   _cons |   1.286328   .3408221     3.774   0.000       .612419    1.960237
------------------------------------------------------------------------------
```

Example 3.5: Explaining Arrest Records

```
use http://fmwww.bc.edu/ec-p/data/wooldridge/CRIME1

sum narr86 pcnv avgsen ptime86 qemp86

Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+--------------------------------------------------------
  narr86 |    2725    .4044037    .8590768         0         12
    pcnv |    2725    .3577872     .395192         0          1
  avgsen |    2725    .6322936    3.508031         0       59.2
 ptime86 |    2725     .387156    1.950051         0         12
  qemp86 |    2725    2.309028    1.610428         0          4

reg narr86 pcnv ptime86 qemp86

  Source |       SS       df       MS                  Number of obs =    2725
---------+------------------------------                F(  3,  2721) =   39.10
   Model |  83.0741941     3   27.691398                Prob > F      =  0.0000
Residual |  1927.27296  2721  .708295833                R-squared     =  0.0413
---------+------------------------------                Adj R-squared =  0.0403
   Total |  2010.34716  2724  .738012906                Root MSE      =   .8416

------------------------------------------------------------------------------
  narr86 |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
    pcnv |  -.1499274   .0408653     -3.669   0.000      -.2300576   -.0697973
 ptime86 |  -.0344199    .008591     -4.007   0.000      -.0512655   -.0175744
  qemp86 |   -.104113   .0103877    -10.023   0.000      -.1244816   -.0837445
   _cons |   .7117715   .0330066     21.565   0.000       .647051     .776492
------------------------------------------------------------------------------
```

Change in the predicted number of arrests when proportion of convictions increases by .5 for 1 man

```
display _b[pcnv]*.5
-.075
```

Change in the predicted number of arrests when proportion of convictions increases by .5 for 100 men

```
display 100*_b[pcnv]*.5
-7.5
```

Change in the predicted number of arrests when prison term increases by 12

display _b[ptime86]*12
-.408

Change in the predicted number of arrests when legal employment increases by a quarter for 100 men

display _b[qemp86]*100
-10.4

reg narr86 pcnv avgsen ptime86 qemp86

```
  Source |       SS       df       MS              Number of obs =    2725
---------+------------------------------           F(  4,  2720) =   29.96
   Model |  84.8242895     4  21.2060724            Prob > F      =  0.0000
Residual |  1925.52287  2720  .707912819            R-squared     =  0.0422
---------+------------------------------           Adj R-squared =  0.0408
   Total |  2010.34716  2724  .738012906            Root MSE      =  .84138

------------------------------------------------------------------------------
  narr86 |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
    pcnv |  -.1508319   .0408583     -3.692   0.000      -.2309484   -.0707154
  avgsen |   .0074431   .0047338      1.572   0.116      -.0018392    .0167254
 ptime86 |  -.0373908   .0087941     -4.252   0.000      -.0546345   -.0201471
  qemp86 |   -.103341   .0103965     -9.940   0.000      -.1237268   -.0829552
   _cons |   .7067565   .0331515     21.319   0.000       .6417519     .771761
------------------------------------------------------------------------------
```

Example 3.6: Hourly Wage Equation

use http://fmwww.bc.edu/ec-p/data/wooldridge/WAGE1

reg lwage educ

```
  Source |       SS       df       MS              Number of obs =     526
---------+------------------------------           F(  1,   524) =  119.58
   Model |  27.5606296     1  27.5606296            Prob > F      =  0.0000
Residual |  120.769132   524  .230475443            R-squared     =  0.1858
---------+------------------------------           Adj R-squared =  0.1843
   Total |  148.329762   525   .28253288            Root MSE      =  .48008

------------------------------------------------------------------------------
   lwage |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
```

```
---------+--------------------------------------------------------------------
    educ |   .0827444   .0075667     10.935   0.000       .0678796    .0976092
   _cons |   .5837726   .0973358      5.998   0.000       .3925562     .774989
---------+--------------------------------------------------------------------
```

This page prepared by Oleksandr Talavera (revised 13 Sep 2002)

Send your questions/comments/suggestions to Kit Baum at **baum@bc.edu**
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