```
------------------------------------------------------------------------------------------
      name:  <unnamed>
       log:  C:\Users\WLJY8\Desktop\资料\ECO 375\A1\A1.log
  log type:  text
 opened on:  13 Oct 2019, 11:59:19

. do "C:\Users\WLJY8\Desktop\资料\ECO 375\A1\HW1.do"

. *Computer Based Problems
.
. *1.Weight Loss
.
.  *(b)
.  clear all


.
.  use "C:\Users\WLJY8\Desktop\资料\ECO 375\A1\WeightFoodDays.dta"

.  describe

Contains data from C:\Users\WLJY8\Desktop\资料\ECO 375\A1\WeightFoodDays.dta
  obs:            81
 vars:             4                          21 Sep 2019 14:06
------------------------------------------------------------------------------------------
              storage   display    value
variable name   type    format     label      variable label
------------------------------------------------------------------------------------------
TimeUnitDay     int     %td                   Date (day, month, year) increments by day
WeightPounds    double  %10.0g                Weight (pounds) measured upon waking up
WaistInches     double  %10.0g                Waist (inches) measured upon waking up -
                                                started collecting on aug 7
PlatesFoodCons  float   %9.0g                 Plates of food consumed at end of each day
------------------------------------------------------------------------------------------
Sorted by: TimeUnitDay

.  summarize

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
 TimeUnitDay |         81    21772.47    24.42595      21726      21813
WeightPounds |         81    165.4989    7.967776   152.1188   180.3379
 WaistInches |         46    34.93957    1.344052      33.25      37.75
PlatesFood~s |         81     2.91358    .9643331          2          6

.  gen BMI=(WeightPounds/2.2)/1.73^2

.
.  tabstat WeightPounds WaistInches PlatesFoodCons BMI, s(mean v sd n)

   stats |  Weight~s  WaistI~s  Plates~s       BMI
---------+--------------------------------------
    mean |  165.4989  34.93957   2.91358  25.13508
variance |  63.48545  1.806475  .9299383  1.464348
      sd |  7.967776  1.344052  .9643331  1.210103
       N |        81        46        81        81
----------------------------------------------------

.
.  *(c)
.  scatter WeightPounds TimeUnitDay

.
.  scatter WaistInches TimeUnitDay

.
.  *(d)
.  reg WeightPounds TimeUnitDay

      Source |       SS           df       MS      Number of obs   =        81
-------------+----------------------------------   F(1, 79)        =   5985.26
       Model |  5012.67309         1  5012.67309   Prob > F        =    0.0000
    Residual |  66.1627609        79  .837503302   R-squared       =    0.9870
-------------+----------------------------------   Adj R-squared   =    0.9868
       Total |  5078.83585        80  63.4854481   Root MSE        =    .91515

------------------------------------------------------------------------------
WeightPounds |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 TimeUnitDay |  -.3240695   .0041889   -77.36   0.000    -.3324073   -.3157318
       _cons |   7221.293   91.20207    79.18   0.000     7039.759    7402.826
------------------------------------------------------------------------------

.
.  * iv) 7221.293 - 0.3240695 * TimeUnitDay =145,
```

```
.  *TimeUnitDay = 21835.7266
.  di %td 21835.7266
13oct2019


.
. * 2. Exports and Employment.
. * (a)
.
.  clear all

.  use "C:\Users\WLJY8\Desktop\资料\ECO 375\A1\AMS_exporters.dta"

.
.  describe

Contains data from C:\Users\WLJY8\Desktop\资料\ECO 375\A1\AMS_exporters.dta
  obs:         2,299
 vars:             7                          21 Sep 2019 14:33
-------------------------------------------------------------------------------------------
              storage   display    value
variable name   type    format     label      variable label
-------------------------------------------------------------------------------------------
nordest         long    %12.0g                Establishment id
employment_w    int     %8.0g                 Number of women employees
employment_m    int     %8.0g                 Number of men employees
capital         double  %10.0g                Capital value
materials       double  %10.0g                Materials value
exports         long    %12.0g                Exports value
revenue         double  %10.0g                Revenue value
-------------------------------------------------------------------------------------------
Sorted by:

.
.  gen total_employment= employment_w + employment_m

.
.  tabstat exports total_employment, s(mean sd median p25 p75 )

   stats |   exports  total_~t
---------+--------------------
    mean |  1.42e+07  172.4819
      sd |  5.44e+07   243.153
     p50 |   1385333        94
     p25 |    233964        39
     p75 |   7752355       215
------------------------------

.
.  gen lnexports = log(exports)

.
.  gen lntotal_employment = log(total_employment)

.
.  tabstat lnexports lntotal_employment, s(mean sd median p25 p75 )

   stats |  lnexpo~s  lntota~t
---------+--------------------
    mean |  14.03814  4.481492
      sd |  2.553711  1.214396
     p50 |  14.14145  4.543295
     p25 |  12.36292  3.663562
     p75 |  15.86351  5.370638
------------------------------

.
.  * (b)
.  scatter lnexports lntotal_employment

.
.  * (c)
.  reg lnexports lntotal_employment

      Source |       SS           df       MS      Number of obs   =     2,299
-------------+----------------------------------   F(1, 2297)      =    667.23
       Model |  3373.32341         1  3373.32341   Prob > F        =    0.0000
    Residual |  11612.9476     2,297  5.05570205   R-squared       =    0.2251
-------------+----------------------------------   Adj R-squared   =    0.2248
       Total |   14986.271     2,298  6.52144083   Root MSE        =    2.2485

------------------------------------------------------------------------------
     lnexports |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
lntotal_employment |   .9976858   .0386238    25.83   0.000     .9219446    1.073427
```

```
             _cons |   9.567017   .1793324    53.35   0.000     9.215346    9.918687
------------------------------------------------------------------------------

.
.
.  * (d)
.  * median of total_employment is 94
.  * median of lntotal_employment is 4.543295
.  gen lnest_exports = _b[_cons] + _b[lntotal_employment] * 4.543295

.  sum(lnest_exports)

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
lnest_expo~s |      2,299     14.0998           0    14.0998    14.0998

.
.  gen est_exports=exp( 14.0998 )

.  sum(est_exports)

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
 est_exports |      2,299     1328818           0    1328818    1328818

.
. * est_exports=e^lnest_exports= 1328818
.
.
.  * (e)
.  gen lnmaterials = log(materials)

.
.  gen lncapital = log(capital)

.
.  reg  lnexports lntotal_employment lnmaterials lncapital

      Source |       SS           df       MS      Number of obs   =     2,299
-------------+----------------------------------   F(3, 2295)      =    604.95
       Model |  6617.71837         3  2205.90612   Prob > F        =    0.0000
    Residual |  8368.55265     2,295  3.64642817   R-squared       =    0.4416
-------------+----------------------------------   Adj R-squared   =    0.4409
       Total |   14986.271     2,298  6.52144083   Root MSE        =    1.9096

------------------------------------------------------------------------------
         lnexports |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------+----------------------------------------------------------------
lntotal_employment |  -.0281651   .0516769    -0.55   0.586    -.1295034    .0731731
       lnmaterials |   .8166265   .0333824    24.46   0.000     .7511637    .8820893
         lncapital |   .0634026   .0330915     1.92   0.055    -.0014897    .1282949
             _cons |   .5112672   .3612492     1.42   0.157    -.1971418    1.219676
------------------------------------------------------------------------------

.
.  scatter total_employment materials

.  scatter total_employment capital

.
.  *(f)
.  reg lntotal_employment lnmaterials lncapital

      Source |       SS           df       MS      Number of obs   =     2,299
-------------+----------------------------------   F(2, 2296)      =   1701.29
       Model |  2023.54234         2  1011.77117   Prob > F        =    0.0000
    Residual |  1365.44832     2,296  .594707455   R-squared       =    0.5971
-------------+----------------------------------   Adj R-squared   =    0.5967
       Total |  3388.99066     2,298   1.4747566   Root MSE        =    .77117

------------------------------------------------------------------------------
lntotal_em~t |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 lnmaterials |   .2074299   .0127675    16.25   0.000      .182393    .2324669
   lncapital |   .2783011   .0120358    23.12   0.000     .2546988    .3019033
       _cons |  -3.039001   .1313826   -23.13   0.000    -3.296642    -2.78136
------------------------------------------------------------------------------

.
.  gen lntotal_employment_new = _b[_cons] + _b[lnmaterials]* lnmaterials +_b[lncapital]* lnc
> apital

.
.  gen est_error = lntotal_employment - lntotal_employment_new
```

```
.
.  sum(est_error)

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
   est_error |      2,299    4.51e-09    .7708371  -5.023922   2.758695

.
.  reg lnexports est_error

      Source |       SS           df       MS      Number of obs   =     2,299
-------------+----------------------------------   F(1, 2297)      =      0.17
       Model |  1.08317372         1  1.08317372   Prob > F        =    0.6837
    Residual |  14985.1878     2,297  6.52380838   R-squared       =    0.0001
-------------+----------------------------------   Adj R-squared   =   -0.0004
       Total |   14986.271     2,298  6.52144083   Root MSE        =    2.5542

------------------------------------------------------------------------------
   lnexports |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   est_error |  -.0281651   .0691215    -0.41   0.684    -.1637121    .1073819
       _cons |   14.03814   .0532698   263.53   0.000     13.93368     14.1426
------------------------------------------------------------------------------

.
.
. * 3. Monte Carlo Simulation.*
.
.  * a)
. clear all

. set seed 123456

.
. program regression1, rclass
  1. drop _all
  2. set obs 100
  3. gen x1 = rnormal(0,1)
  4. gen v = rnormal(-1,2)
  5. gen x2 = 0.4*x1 + v
  6. gen u = rnormal(0,3)
  7. gen y = 5 - 2*x1-3*x2 + u
  8. reg y x1 x2
  9. return scalar b1 = _b[x1]
 10. return scalar b2 = _b[x2]
 11. return scalar b0 = _b[_cons]
 12. end

.
. simulate "regression1" b0 = r(b0) b1 = r(b1) b2 = r(b2), reps(1000)

command:      regression1
statistics:   b0         = r(b0)
              b1         = r(b1)
              b2         = r(b2)
.
. * summarize
. sum b0 b1 b2

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
          b0 |      1,000    5.018323    .3576911   3.834016   6.486395
          b1 |      1,000    -2.00721    .3125933  -2.999369  -1.010637
          b2 |      1,000   -2.984774    .1537827  -3.468918  -2.520949

. hist b0, frequency normal name(beta0)
(bin=29, start=3.8340161, width=.09146134)

. hist b1, frequency normal name(beta1)
(bin=29, start=-2.9993689, width=.06857696)

. hist b2, frequency normal name(beta2)
(bin=29, start=-3.4689176, width=.03268857)

.
.
.  *b)
.
. clear all

. set seed 123456
```

```
. program regression2, rclass
  1. drop _all
  2. set obs 100
  3. gen x1 = rnormal(0, 1)
  4. gen v = rnormal(-1,2)
  5. gen x2 = 0.4*x1 + v
  6. gen u = rnormal(0,3)
  7. gen y = 5 - 2*x1-3*x2 + u
  8. reg y x1
  9. return scalar b1 = _b[x1]
 10. return scalar b0 = _b[_cons]
 11. end

.
. simulate "regression2" b0 = r(b0) b1 = r(b1), reps(1000)

command:      regression2
statistics:   b0         = r(b0)
              b1         = r(b1)

. sum b0 b1

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
          b0 |      1,000    8.000995    .6729103    5.68796   10.17895
          b1 |      1,000   -3.192236    .7180337  -5.499341  -.4678245

. hist b0, frequency normal name(beta0)
(bin=29, start=5.6879597, width=.15486178)

. hist b1, frequency normal name(beta1)
(bin=29, start=-5.4993415, width=.17350059)

.
.
.
end of do-file
```