```
-------------------------------------------------------------------------------
      log:
C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_1\info1.l
> og
  log type:  text
 opened on:  23 Oct 2008, 12:11:01

. use vote.dta,clear

. des

Contains data from vote.dta
  obs:           173
 vars:             8                          13 Oct 2008 14:07
 size:         4,671 (99.9% of memory free)
-------------------------------------------------------------------------------
              storage  display     value
variable name   type   format      label      variable label
-------------------------------------------------------------------------------
state           str2   %9s                    state postal code
district        byte   %3.0f                  congressional district
democA          byte   %3.2f                  =1 if A is democrat
voteA           byte   %5.2f                  percent vote for A
expendA         float  %8.2f                  camp. expends. by A, $1000s
expendB         float  %8.2f                  camp. expends. by B, $1000s
prtystrA        byte   %5.2f                  % vote for president
region          str9   %9s                    geographical region
-------------------------------------------------------------------------------
Sorted by:

. sum

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
       state |         0
    district |       173     8.83815    8.768823          1         42
      democA |       173    .5549133     .498418          0          1
       voteA |       173    50.50289    16.78476         16         84
     expendA |       173     310.611    280.9854       .302   1470.674
-------------+--------------------------------------------------------
     expendB |       173    305.0885    306.2783        .93   1548.193
    prtystrA |       173    49.75723     9.98365         22         71
      region |         0

. tab region

geographica |
   l region |      Freq.     Percent        Cum.
------------+-----------------------------------
    MIDWEST |         56       32.37       32.37
  NORTHEAST |         31       17.92       50.29
      SOUTH |         45       26.01       76.30
       WEST |         41       23.70      100.00
------------+-----------------------------------
      Total |        173      100.00
```

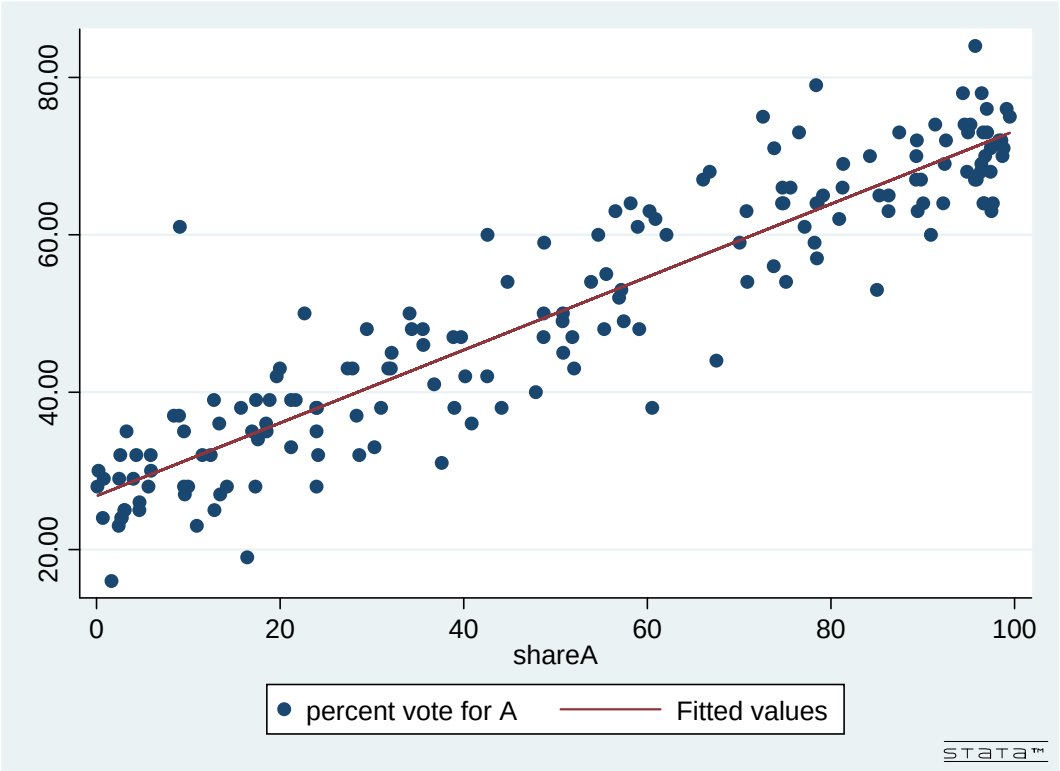
```
. tab region,s(expendA)

            |   Summary of camp. expends. by A,
geographica |                $1000s
   l region |        Mean   Std. Dev.       Freq.
------------+------------------------------------
    MIDWEST |      268.06      257.79          56
  NORTHEAST |      260.29      259.16          31
      SOUTH |      305.69      248.21          45
       WEST |      412.19      338.94          41
------------+------------------------------------
      Total |      310.61      280.99         173

. g expend=expendA+expendB

. tab region,s(expend)

geographica |          Summary of expend
   l region |        Mean   Std. Dev.       Freq.
------------+------------------------------------
    MIDWEST |   524.86791   418.59625          56
  NORTHEAST |    598.4051   431.80768          31
      SOUTH |    661.9238   479.29032          45
       WEST |   702.10461   603.60501          41
------------+------------------------------------
      Total |   615.69954   486.95626         173

. label var expend "total campaign expenditures in $1,000"

. tabstat expend,by(region) s(mean sd min max)

Summary for variables: expend
     by categories of: region (geographical region)

   region |      mean        sd       min       max
----------+--------------------------------------------
  MIDWEST |  524.8679  418.5963    60.705  2017.056
NORTHEAST |  598.4051  431.8077   133.437  1660.512
    SOUTH |  661.9238  479.2903    92.499  1774.264
     WEST |  702.1046   603.605   102.672  3018.867
----------+--------------------------------------------
    Total |  615.6995  486.9563    60.705  3018.867
------------------------------------------------------

. g voteDem=voteA*democA

. replace voteDem=(100-voteA) if democA==0
(77 real changes made)

. tabstat voteDem,by(region) s(mean sd min max)

Summary for variables: voteDem
     by categories of: region (geographical region)

   region |      mean        sd       min       max
----------+--------------------------------------------
  MIDWEST |  53.80357  17.22516        23        81
NORTHEAST |  51.19355  16.78575        28        84
    SOUTH |  54.71111  15.04482        25        78
     WEST |        57  15.73849        25        79
----------+--------------------------------------------
```

```
    Total |  54.32948  16.22126        23        84
----------------------------------------------------

. * REGRESSIONE BIVARIATA

. g shareA=100*(expendA/expend)

. g shareB=100*(expendB/expend)

. reg voteA shareA shareB

      Source |       SS       df       MS              Number of obs =     173
-------------+------------------------------           F(  1,   171) = 1017.66
       Model |  41486.2307     1  41486.2307           Prob > F      =  0.0000
    Residual |  6971.01789   171  40.7661865           R-squared     =  0.8561
-------------+------------------------------           Adj R-squared =  0.8553
       Total |  48457.2486   172  281.728189           Root MSE      =  6.3848

------------------------------------------------------------------------------
       voteA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      shareA |   .4638269   .0145397    31.90   0.000     .4351266    .4925272
      shareB |  (dropped)
       _cons |   26.81221   .8872146    30.22   0.000     25.06091    28.56352
------------------------------------------------------------------------------

. reg voteA shareA

      Source |       SS       df       MS              Number of obs =     173
-------------+------------------------------           F(  1,   171) = 1017.66
       Model |  41486.2307     1  41486.2307           Prob > F      =  0.0000
    Residual |  6971.01789   171  40.7661865           R-squared     =  0.8561
-------------+------------------------------           Adj R-squared =  0.8553
       Total |  48457.2486   172  281.728189           Root MSE      =  6.3848

------------------------------------------------------------------------------
       voteA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      shareA |   .4638269   .0145397    31.90   0.000     .4351266    .4925272
       _cons |   26.81221   .8872146    30.22   0.000     25.06091    28.56352
------------------------------------------------------------------------------

. predict voteA_hat
(option xb assumed; fitted values)

. twoway (scatter voteA shareA) (line voteA_hat shareA)

. graph save Graph
"C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_1\
> Graph1.gph"
(file
C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_1\Graph1.gph
sav
> ed)
```

```
. * REGRESSIONE MULTIVARIATA

. reg voteA expendA expendB pr

      Source |       SS       df       MS              Number of obs =     173
-------------+------------------------------           F(  3,   169) =   74.27
       Model |  27555.5754     3   9185.1918           Prob > F      =  0.0000
    Residual |  20901.6732   169  123.678539           R-squared     =  0.5687
-------------+------------------------------           Adj R-squared =  0.5610
       Total |  48457.2486   172  281.728189           Root MSE      =  11.121

------------------------------------------------------------------------------
       voteA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     expendA |   .0349245   .0033695    10.36   0.000     .0282728    .0415762
     expendB |  -.0349236   .0030012   -11.64   0.000    -.0408482   -.0289989
    prtystrA |    .342514   .0879519     3.89   0.000     .1688881    .5161399
       _cons |   33.26719   4.416784     7.53   0.000     24.54802    41.98636
------------------------------------------------------------------------------

. g expendAd100=expendA/100

. g expendBd100=expendB/100

. reg voteA expendAd100 expendBd100 pr

      Source |       SS       df       MS              Number of obs =     173
-------------+------------------------------           F(  3,   169) =   74.27
       Model |  27555.5751     3  9185.19169           Prob > F      =  0.0000
    Residual |  20901.6735   169  123.678541           R-squared     =  0.5687
-------------+------------------------------           Adj R-squared =  0.5610
       Total |  48457.2486   172  281.728189           Root MSE      =  11.121

------------------------------------------------------------------------------
       voteA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 expendAd100 |   3.492448   .3369475    10.36   0.000      2.82728    4.157616
 expendBd100 |  -3.492355   .3001211   -11.64   0.000    -4.084824   -2.899886
    prtystrA |    .342514   .0879519     3.89   0.000     .1688881      .51614
       _cons |   33.26719   4.416784     7.53   0.000     24.54802    41.98636
------------------------------------------------------------------------------

. g lexpendA=log(expendA)

. g lexpendB=log(expendB)

. reg voteA lexpendA lexpendB pr

      Source |       SS       df       MS              Number of obs =     173
-------------+------------------------------           F(  3,   169) =  215.23
       Model |  38405.1096     3  12801.7032           Prob > F      =  0.0000
    Residual |  10052.1389   169   59.480112           R-squared     =  0.7926
-------------+------------------------------           Adj R-squared =  0.7889
       Total |  48457.2486   172  281.728189           Root MSE      =  7.7123

------------------------------------------------------------------------------
       voteA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lexpendA |   6.083316     .38215    15.92   0.000     5.328914    6.837719
    lexpendB |  -6.615417   .3788203   -17.46   0.000    -7.363246   -5.867588
    prtystrA |   .1519574   .0620181     2.45   0.015     .0295274    .2743873
```

```
       _cons |   45.07893   3.926305    11.48   0.000     37.32801    52.82985
------------------------------------------------------------------------------

. * TEST IPOTESI

. matrix list e(V)

symmetric e(V)[4,4]
            lexpendA    lexpendB    prtystrA       _cons
lexpendA   .14603861
lexpendB  -.00268149   .14350482
prtystrA  -.00654637   .00357734   .00384625
   _cons   -.3949376  -.87406343  -.17616702   15.415871

. test lexpendA=-lexpendB

 ( 1)  lexpendA + lexpendB = 0

       F(  1,   169) =    1.00
            Prob > F =    0.3196

. g diff=lexpendA-lexpendB

. reg voteA diff pr

      Source |       SS       df       MS              Number of obs =     173
-------------+------------------------------           F(  2,   170) =  322.35
       Model |  38345.8491     2  19172.9246           Prob > F      =  0.0000
    Residual |  10111.3994   170    59.47882           R-squared     =  0.7913
-------------+------------------------------           Adj R-squared =  0.7889
       Total |  48457.2486   172  281.728189           Root MSE      =  7.7123

------------------------------------------------------------------------------
       voteA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        diff |   6.351739   .2715131    23.39   0.000     5.815767     6.88771
    prtystrA |   .1463981   .0617668     2.37   0.019     .0244694    .2683269
       _cons |   42.70285   3.122333    13.68   0.000     36.53931    48.86638
------------------------------------------------------------------------------

. * STABILITA' RELAZIONE TRA DEMOCRATICI E REPUBBLICANI

. reg voteA shareA

      Source |       SS       df       MS              Number of obs =     173
-------------+------------------------------           F(  1,   171) = 1017.66
       Model |  41486.2307     1  41486.2307           Prob > F      =  0.0000
    Residual |  6971.01789   171  40.7661865           R-squared     =  0.8561
-------------+------------------------------           Adj R-squared =  0.8553
       Total |  48457.2486   172  281.728189           Root MSE      =  6.3848

------------------------------------------------------------------------------
       voteA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      shareA |   .4638269   .0145397    31.90   0.000     .4351266    .4925272
       _cons |   26.81221   .8872146    30.22   0.000     25.06091    28.56352
------------------------------------------------------------------------------

. gen shareAdemocA=shareA*democA

. reg voteA shareA democA shareAdemocA
```

```
      Source |       SS       df       MS              Number of obs =     173
-------------+------------------------------           F(  3,   169) =  336.94
       Model |  41516.0757     3  13838.6919           Prob > F      =  0.0000
    Residual |  6941.17285   169  41.0720287           R-squared     =  0.8568
-------------+------------------------------           Adj R-squared =  0.8542
       Total |  48457.2486   172  281.728189           Root MSE      =  6.4087

------------------------------------------------------------------------------
       voteA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      shareA |   .4780487   .0229972    20.79   0.000     .4326499    .5234475
      democA |   1.366741   1.810538     0.75   0.451    -2.207443    4.940924
shareAdemocA |  -.0259215   .0306112    -0.85   0.398    -.0863511    .0345082
       _cons |   26.18025   1.189659    22.01   0.000     23.83174    28.52875
------------------------------------------------------------------------------

. test (democA=0) (shareAdemocA=0)

 ( 1)  democA = 0
 ( 2)  shareAdemocA = 0

       F(  2,   169) =    0.36
            Prob > F =    0.6959

. save vote_new.dta,replace
(note: file vote_new.dta not found)
file vote_new.dta saved

. log close
       log:
C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_1\info1.l
> og
  log type:  text
 closed on:  23 Oct 2008, 12:27:43
-------------------------------------------------------------------------------
```


80.00
60.00
40.00
20.00
0
20
40
60
80
100
shareA
percent vote for A
Fitted values