```
                                                                      ___  ____  ____  ____  ____(R)
                                                                     /__    /   ____/   /   ____/
                                                                    ___/   /   /___/   /   /___/
                                                                      Statistics/Data analysis

                                                                         User: Airline Route analysis
                                                                    Project: Route Analysis
```

```
. br
      name:  <unnamed>
       [redacted]
  log type:  smcl
 opened on:  22 Sep 2025, 00:24:32

. 
. *Note that you have to put your pathname, based on where you want to store your log file
. * The replace command allows you to override the existing log file.
. * You can also just write a new file name instead each time in your do file.
. * The log file saves the output so you can see what is happening
. 
. 
. * This is the data I am using (401k)
. 
[redacted]
. 
. *Noted log file and data locations.
. 
. *Browsed data.
. br

. 
. *Summary of 401k data.
. sum
```

Variable	Obs	Mean	Std. dev.	Min	Max
prate	1,534	87.36291	16.71654	3	100
mrate	1,534	.7315124	.7795393	.01	4.91
totpart	1,534	1354.231	4629.265	50	58811
totelg	1,534	1628.535	5370.719	51	70429
age	1,534	13.18123	9.171114	4	51
totemp	1,534	3568.495	11217.94	58	144387
sole	1,534	.4876141	.5000096	0	1
ltotemp	1,534	6.686034	1.453375	4.060443	11.88025

```
. 
. *Used des to further investigate data.
. des
```

[redacted]

```
  Observations:         1,534
     Variables:             8                  18 Sep 2025 01:42
```

Variable name	Storage type	Display format	Value label	Variable label
prate	float	%7.0g		participation rate, percent
mrate	float	%7.0g		401k plan match rate
totpart	float	%7.0g		total 401k participants
totelg	float	%7.0g		total eligible for 401k plan
age	byte	%7.0g		age of 401k plan
totemp	float	%7.0g		total number of firm employees
sole	byte	%7.0g		= 1 if 401k is firm's sole plan
ltotemp	float	%9.0g		log of totemp

```
Sorted by:
```

```
23 .
24 . log close
      name:  <unnamed>
       log:  [redacted]
  log type:  smcl
 closed on:  22 Sep 2025, 00:24:32
------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------
      name:  [redacted]
       log:  [redacted]
  log type:  smcl
 opened on:  22 Sep 2025, 00:32:55

[redacted]

26 . des

[redacted]
Observations:         1,534
   Variables:             8                  18 Sep 2025 01:42
------------------------------------------------------------------------------------------------------------------------
Variable      Storage   Display    Value
    name         type    format    label      Variable label
------------------------------------------------------------------------------------------------------------------------
prate           float   %7.0g                 participation rate, percent
mrate           float   %7.0g                 401k plan match rate
totpart         float   %7.0g                 total 401k participants
totelg          float   %7.0g                 total eligible for 401k plan
age             byte    %7.0g                 age of 401k plan
totemp          float   %7.0g                 total number of firm employees
sole            byte    %7.0g                 = 1 if 401k is firm's sole plan
ltotemp         float   %9.0g                 log of totemp
------------------------------------------------------------------------------------------------------------------------
Sorted by:

27 . br

28 . sum

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
       prate |      1,534    87.36291    16.71654         3        100
       mrate |      1,534    .7315124    .7795393       .01       4.91
     totpart |      1,534    1354.231    4629.265        50      58811
      totelg |      1,534    1628.535    5370.719        51      70429
         age |      1,534    13.18123    9.171114         4         51
-------------+---------------------------------------------------------
      totemp |      1,534    3568.495    11217.94        58     144387
        sole |      1,534    .4876141    .5000096         0          1
     ltotemp |      1,534    6.686034    1.453375  4.060443   11.88025

[redacted]

30 . reg prate mrate

      Source |       SS           df       MS      Number of obs   =     1,534
-------------+----------------------------------   F(1, 1532)      =    123.68
       Model |  32001.7271         1  32001.7271   Prob > F        =    0.0000
    Residual |  396383.812     1,532   258.73617   R-squared       =    0.0747
-------------+----------------------------------   Adj R-squared   =    0.0741
       Total |  428385.539     1,533  279.442622   Root MSE        =    16.085
```

prate	Coefficient	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**

31 . di 83.07546 + 5.861079(3.5)
unknown function 5.861079()
r(133);

32 . . di 83.07546 + 5.861079*3.5
103.58924

[redacted]

34 . br

35 . sum

Variable	Obs	Mean	Std. dev.	Min	Max
salary	**177**	**865.8644**	**587.5893**	**100**	**5299**
age	**177**	**56.42938**	**8.42189**	**33**	**86**
college	**177**	**.9717514**	**.1661523**	**0**	**1**
grad	**177**	**.5310734**	**.5004492**	**0**	**1**
comten	**177**	**22.50282**	**12.29473**	**2**	**58**
ceoten	**177**	**7.954802**	**7.150826**	**0**	**37**
sales	**177**	**3529.463**	**6088.654**	**29**	**51300**
profits	**177**	**207.8305**	**404.4543**	**-463**	**2700**
mktval	**177**	**3600.316**	**6442.276**	**387**	**45400**
lsalary	**177**	**6.582848**	**.6060594**	**4.60517**	**8.575274**
lsales	**177**	**7.231025**	**1.432086**	**3.367296**	**10.84545**
lmktval	**177**	**7.39941**	**1.133414**	**5.958425**	**10.72327**
comtensq	**177**	**656.6836**	**577.1227**	**4**	**3364**
ceotensq	**177**	**114.1243**	**212.566**	**0**	**1369**
profmarg	**177**	**6.42011**	**17.86074**	**-203.0769**	**47.45763**

36 . des

[redacted]

Observations: **177**
Variables: **15** **17 Aug 1999 23:14**

Variable name	Storage type	Display format	Value label	Variable label
salary	int	%9.0g		**1990 compensation, $1000s**
age	byte	%9.0g		**in years**
college	byte	%9.0g		**=1 if attended college**
grad	byte	%9.0g		**=1 if attended graduate school**
comten	byte	%9.0g		**years with company**
ceoten	byte	%9.0g		**years as ceo with company**
sales	float	%9.0g		**1990 firm sales, millions**
profits	int	%9.0g		**1990 profits, millions**
mktval	float	%9.0g		**market value, end 1990, mills.**
lsalary	float	%9.0g		**log(salary)**
lsales	float	%9.0g		**log(sales)**
lmktval	float	%9.0g		**log(mktval)**
comtensq	int	%9.0g		**comten^2**
ceotensq	int	%9.0g		**ceoten^2**
profmarg	float	%9.0g		**profits as % of sales**

Sorted by:

```
37 . log off
      name:  <unnamed>
       log:  [redacted]
  log type:  smcl
 paused on:  22 Sep 2025, 02:34:18
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  [redacted]
  log type:  smcl
resumed on:  22 Sep 2025, 02:34:31

38 . log close
      name:  <unnamed>
       log:  [redacted]
  log type:  smcl
 closed on:  22 Sep 2025, 02:35:39
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  [redacted]
  log type:  smcl
opened on:  22 Sep 2025, 02:36:12

[redacted]

40 . sum

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
      salary |        177    865.8644    587.5893       100       5299
         age |        177    56.42938     8.42189        33         86
     college |        177    .9717514    .1661523         0          1
        grad |        177    .5310734    .5004492         0          1
      comten |        177    22.50282    12.29473         2         58
-------------+---------------------------------------------------------
      ceoten |        177    7.954802    7.150826         0         37
       sales |        177    3529.463    6088.654        29      51300
     profits |        177    207.8305    404.4543      -463       2700
      mktval |        177    3600.316    6442.276       387      45400
     lsalary |        177    6.582848    .6060594   4.60517   8.575274
-------------+---------------------------------------------------------
      lsales |        177    7.231025    1.432086  3.367296   10.84545
     lmktval |        177     7.39941    1.133414  5.958425   10.72327
    comtensq |        177    656.6836    577.1227         4       3364
    ceotensq |        177    114.1243     212.566         0       1369
    profmarg |        177     6.42011    17.86074  -203.0769   47.45763

41 . ceoten = 0
command ceoten is unrecognized
r(199);

42 . ceoten == 0
command ceoten is unrecognized
r(199);
```

```
43 . ceoten==0
   command ceoten is unrecognized
   r(199);

44 . ceoten = = 0
   command ceoten is unrecognized
   r(199);

45 . tab ceoten == 0
   == invalid name
   r(198);

46 . sum obs if ceoten == 0
   variable obs not found
   r(111);

47 . sum obs if ceoten == 0
   variable obs not found
   r(111);

48 . gen ceoten if ceoten == 0
   variable ceoten already defined
   r(110);

49 . sum ceoten if ceoten ==0

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
      ceoten |          5           0           0           0          0

50 . sum ceoten == 0
   == invalid name
   r(198);

51 . tab ceoten if ceoten == 0

  years as |
  ceo with |
   company |      Freq.     Percent        Cum.
-----------+-----------------------------------
         0 |          5      100.00      100.00
-----------+-----------------------------------
     Total |          5      100.00

52 . ceoten == 0
   command ceoten is unrecognized
   r(199);

53 . tab ceoten

  years as |
  ceo with |
   company |      Freq.     Percent        Cum.
-----------+-----------------------------------
         0 |          5        2.82        2.82
         1 |         19       10.73       13.56
         2 |         10        5.65       19.21
         3 |         21       11.86       31.07
         4 |         21       11.86       42.94
         5 |         10        5.65       48.59
         6 |         11        6.21       54.80
         7 |          6        3.39       58.19
         8 |         11        6.21       64.41
         9 |          8        4.52       68.93
        10 |          8        4.52       73.45
        11 |          4        2.26       75.71
        12 |          7        3.95       79.66
```

13	7	3.95	83.62
14	5	2.82	86.44
15	2	1.13	87.57
16	2	1.13	88.70
17	2	1.13	89.83
18	1	0.56	90.40
19	2	1.13	91.53
20	4	2.26	93.79
21	1	0.56	94.35
22	1	0.56	94.92
24	3	1.69	96.61
26	2	1.13	97.74
28	1	0.56	98.31
34	1	0.56	98.87
37	2	1.13	100.00
Total	177	100.00	

```
54 . reg salary ceoten
```

Source	SS	df	MS		
Model	1241694.06	1	1241694.06	Number of obs	= 177
Residual	59524270.7	175	340138.69	F(1, 175)	= 3.65
Total	60765964.7	176	345261.163	Prob > F	= 0.0577
				R-squared	= 0.0204
				Adj R-squared	= 0.0148
				Root MSE	= 583.21

salary	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ceoten	11.74613	6.14774	1.91	0.058	-.387127	23.87939
_cons	772.4263	65.67567	11.76	0.000	642.8079	902.0446

```
55 . reg log(salary) ceoten
variable log not found
r(111);

56 . reg ln(salary) ceoten
variable ln not found
r(111);

57 . gen lnsalary = ln(salary)

58 . gen lnsalary ceoten
variable lnsalary already defined
r(110);

59 . reg lnsalary ceoten
```

Source	SS	df	MS		
Model	.850907024	1	.850907024	Number of obs	= 177
Residual	63.795306	175	.364544606	F(1, 175)	= 2.33
Total	64.6462131	176	.367308029	Prob > F	= 0.1284
				R-squared	= 0.0132
				Adj R-squared	= 0.0075
				Root MSE	= .60378

lnsalary	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ceoten	.0097236	.0063645	1.53	0.128	-.0028374	.0222846
_cons	6.505498	.0679911	95.68	0.000	6.37131	6.639686

[redacted]

62 . des

[redacted]

Observations: 408
Variables: 17 16 Sep 1996 16:21

Variable name	Storage type	Display format	Value label	Variable label
lnchprg	float	%9.0g		**perc of studs in sch lnch prog**
enroll	int	%9.0g		**school enrollment**
staff	float	%9.0g		**staff per 1000 students**
expend	int	%9.0g		**expend. per stud, $**
salary	float	%9.0g		**avg. teacher salary, $**
benefits	int	%9.0g		**avg. teacher benefits, $**
droprate	float	%9.0g		**school dropout rate, perc**
gradrate	float	%9.0g		**school graduation rate, perc**
math10	float	%9.0g		**perc studs passing MEAP math**
sci11	float	%9.0g		**perc studs passing MEAP science**
totcomp	float	%9.0g		**salary + benefits**
ltotcomp	float	%9.0g		**log(totcomp)**
lexpend	float	%9.0g		**log of expend**
lenroll	float	%9.0g		**log(enroll)**
lstaff	float	%9.0g		**log(staff)**
bensal	float	%9.0g		**benefits/salary**
lsalary	float	%9.0g		**log(salary)**

Sorted by:

63 . br

64 . sum

Variable	Obs	Mean	Std. dev.	Min	Max
lnchprg	**408**	**25.20147**	**13.61008**	**1.4**	**79.5**
enroll	**408**	**2663.806**	**2696.821**	**212**	**16793**
staff	**408**	**100.6417**	**13.29952**	**65.9**	**166.6**
expend	**408**	**4376.578**	**775.7897**	**3332**	**7419**
salary	**408**	**31774.51**	**5038.304**	**19764**	**52812**
benefits	**408**	**6463.429**	**1456.338**	**0**	**11618**
droprate	**408**	**5.066422**	**5.485072**	**0**	**61.9**
gradrate	**408**	**83.65172**	**13.36838**	**23.5**	**127.1**
math10	**408**	**24.10686**	**10.49361**	**1.9**	**66.7**
sci11	**408**	**49.18309**	**12.52467**	**7.2**	**85.7**
totcomp	**408**	**38237.94**	**5985.086**	**24498**	**63518**
ltotcomp	**408**	**10.53996**	**.1512674**	**10.10635**	**11.05908**
lexpend	**408**	**8.370177**	**.1618824**	**8.111328**	**8.911799**
lenroll	**408**	**7.509714**	**.8673043**	**5.356586**	**9.728718**
lstaff	**408**	**4.603369**	**.1266831**	**4.188138**	**5.115596**
bensal	**408**	**.2045028**	**.037533**	**0**	**.4499853**
lsalary	**408**	**10.35439**	**.1543158**	**9.891618**	**10.87449**

```
65 . reg lnexpend = ln(expend)
invalid syntax
r(198);

66 . gen lnexpend = ln(expend)

67 . br

68 . reg math10 lnexpend
```

Source	SS	df	MS	Number of obs	=	408
				F(1, 406)	=	12.41
Model	1329.42517	1	1329.42517	Prob > F	=	0.0005
Residual	43487.7553	406	107.112698	R-squared	=	0.0297
				Adj R-squared	=	0.0273
Total	44817.1805	407	110.115923	Root MSE	=	10.35

math10	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
lnexpend	11.16439	3.169011	3.52	0.000	4.934677	17.39411
_cons	-69.3411	26.53013	-2.61	0.009	-121.4947	-17.18753

```
69 . log close
      name:  <unnamed>
       log:  [redacted]
  log type:  smcl
 closed on:  22 Sep 2025, 05:04:55
```