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Stata tip 113: Changing a variable's format: What it does and does not mean

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1 Introduction

Stata variables are all associated with a display format. Users can assign such a display format or work with a display format assigned by default. Thus suppose that you create new variables, for example,

```
. set obs 1
obs was 0, now 1
. generate mynum = 42
. generate mystr = "42"
```

Now type

```
. describe
Contains data
  obs:             1
 vars:             2
 size:             6
-------------------------------------------------------------------------------
              storage  display     value
variable name   type   format      label      variable label
-------------------------------------------------------------------------------
mynum           float  %9.0g
mystr           str2   %9s
-------------------------------------------------------------------------------
Sorted by:
     Note:  dataset has changed since last saved
```

You can see that `mynum` has been created as a `float` variable with display format `%9.0g` and that `mystr` has been created as a `str2` variable with display format `%9s`. If you do not like either of those formats, you can change them using the `format` command (see [D] **format**).

The problem addressed in this tip is that users are often puzzled over exactly what is meant by changing formats. Part of the problem behind such puzzlement may be linguistic. Sometimes, the term "format" is used vaguely or loosely, such as when "formatting" implies something like initial preparation or transformation of the data. At other times, the term may be used precisely but not in the sense of Stata's `format` command. Thus you may read of long or wide format in the sense of dataset shape or

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structure. Part of the solution to such puzzlement is thus also linguistic, to remember that "format" here means "display format".

2 Applying format

Consider `auto.dta`, in particular the `gear_ratio` variable.

```
. sysuse auto, clear
(1978 Automobile Data)
. codebook gear_ratio
```

```
gear_ratio                                                    Gear Ratio
-------------------------------------------------------------------------

                  type:  numeric (float)
                 range:  [2.19,3.89]                  units:  .01
         unique values:  36                       missing .:  0/74
                  mean:   3.01486
             std. dev:   .456287
           percentiles:        10%       25%       50%       75%       90%
                              2.43      2.73     2.955      3.37      3.72
```

`codebook` usefully reports that this variable has units (some say "resolution": for example, Murphy [1997]) of 0.01, meaning that values for this variable are given to 2 decimal places. Regardless of that, from the results of

```
. summarize gear_ratio
    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
  gear_ratio |         74    3.014865    .4562871       2.19       3.89
```

we can see that the default display of `summarize` shows many decimal places. The mean is reported to 6 decimal places and the standard deviation to 7, which is many more than are present in the original data. It can be asserted confidently that `summarize` shows far more minute detail than anyone can use or interpret. However, typing

```
. describe gear_ratio
              storage  display     value
variable name   type   format      label      variable label
------------------------------------------------------------------------
gear_ratio      float  %6.2f                  Gear Ratio
```

shows that `gear_ratio` has a display format of `%6.2f`. If we wish `summarize` to honor that display format, we must specify the `format` option:

```
. summarize gear_ratio, format
    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
  gear_ratio |         74        3.01        0.46       2.19       3.89
```

Now the results may be a little too Spartan for some tastes. One common suggestion is that a standard deviation can be reported a little more precisely than the original data. To get a more precise display, we can change the format of `gear_ratio`:

```
. format gear_ratio %6.3f
```

We see the result when we reissue the `summarize` command:

```
. summarize gear_ratio, format
    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
  gear_ratio |         74       3.015       0.456       2.190      3.890
```

This example is telling. The first thing to do is look for an option that changes the format of results. If there is not one, or it does not do what you want, then use `format` directly and reissue the command.

Moreover, it should be clear that `format` cannot introduce a third decimal place to the `gear_ratio` data that was never typed in originally, that is, at the time `auto.dta` was compiled. All `format` does is change how data and results are displayed. Even if the format is changed to one coarser than was entered, a detailed check will confirm that the data themselves are unchanged. One way to see this, left as an exercise for you, is to vary the format of some key variable and then check that the results from some interesting command remain completely identical. Use `return list` or `ereturn list` to get a high-resolution display.

3 Date formats

Dates are common in many problems but often do not arrive in exactly the right form for analysis. Hence users often want to convert dates as received to some other kind of date.

A common misconception is that changing the date format is the way to change one kind of date to another kind. That is wrong. Suppose we wish to change daily dates to monthly dates. As an experiment, set up a daily date variable:

```
. clear
. set obs 1
obs was 0, now 1
. generate mydate = d(8oct2012)
. format mydate %td
. list
```

```
     +------------+
     |    mydate |
     |------------|
  1. | 08oct2012 |
     +------------+
```

Now change the format to monthly:

```
. format mydate %tm
. list
```

	mydate
1.	3566m3

You may think that the data have changed but to something absurd, so how did Stata mess up? In fact, the data have not changed. The data are still an integer value of 19274, which is October 8, 2012, when you count days from a zero date of January 1, 1960. The integer value 19274 is also March 3566 when you count months from a zero date of January 1960. The result is not what we may have wanted or expected, but Stata's point of view is that it gave us what we asked for, the same data value but interpreted according to a different format.

To convert a date, we need to use an appropriate conversion function. Then, and only then, will `format` work to produce nicer displays:

```
. generate mymonth = mofd(mydate)
. format mymonth %tm
. format mydate %td
. list
```

	mydate	mymonth
1.	08oct2012	2012m10

Reference

Murphy, E. A. 1997. *The Logic of Medicine*. 2nd ed. Baltimore: Johns Hopkins University Press.