THE STATA JOURNAL

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

Nicholas J. Cox Department of Geography Durham University Durham, UK n.j.cox@durham.ac.uk

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

variable name	storage type	display format	value label	variable label	
mynum mystr	float str2				

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

762 Stata tip 113

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 (floa	at)			
range: unique values:				ts: .01	
mean: std. dev:	3.01486 .456287				
percentiles:	10% 2.43	25% 2.73	50% 2.955	75% 3.37	90% 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

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

gear_ratio	float	%6.2f		Gear Ratio	
	0	display format	value label	variable label	
. describe gea	ar_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

N. J. Cox 763

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:

764 Stata tip 113

Now change the format to monthly:

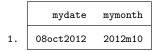
- . format mydate %tm
- . list



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



Reference

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