

Word Processor Friendly PROC MEANS Type SAS® Output using the SAS Macro Facility

Laurie Tuason, The Cleveland Clinic Foundation, Cleveland, Ohio

ABSTRACT

A macro has been developed that circumvents the problem of the inability to use proportionally spaced fonts when importing SAS output into a word processing package. The output from the macro is similar to PROC MEANS type output with the addition of the median, mode, the paired t-test p-value, the Wilcoxon signed rank (WSR) p-value, and the normality p-value. Labels can be used describing the variables, as well as "by" variables with formats. The following statistics and p-values can be requested, and their ordering can be specified by the macro user: n, mean, median, standard deviation, standard error of the mean, min, max, mode, paired t-test p-value, Wilcoxon signed rank p-value and the normality p-value. The macro produces an output file in which spaces between the statistics and p-values within a line have been replaced with single tabs. This file can then easily be imported into most word processing software packages.

INTRODUCTION

When a visually appealing presentation of statistics and p-values is desired, SAS output can be saved to a file and then later imported into a word processing program and edited. Problems occur, however, when the desired font uses proportional spacing. The following may result (data are from Conover (1980), p. 292 (see appendix A), and have been slightly modified):

VARIABLE	N	MEAN	SD	SE	MEDIAN	MIN	MAX
Before	20	0.72	0.09	0.02	0.70	0.58	0.88
After	20	0.76	0.10	0.02	0.73	0.60	0.97

Using a non-proportionately spaced font will properly align the above output:

VARIABLE	N	MEAN	SD	SE	MEDIAN	MIN	MAX
Before	20	0.72	0.09	0.02	0.70	0.58	0.88
After	20	0.76	0.10	0.02	0.73	0.60	0.97

After using the macro and importing the output into a table, the proportionately spaced font output now appears more pleasing (importing and modifications to the table take under two minutes). Also, a simple tabular format could be used instead of a table structure, if desired.

	N	MEAN	SD	SE	MEDIAN	MIN	MAX
Before	20	0.72	0.09	0.02	0.70	0.58	0.88
After	20	0.76	0.10	0.02	0.73	0.60	0.97

THE MACRO

MACRO CALL:

```
%univ(vlist=variable list,
ds= _LAST_,fmt=8.2,labels=n,ofile=filename,overwrite=n,byvar=,
header=y,stats=n mean sd se median min max mode t wsr norm)
```

REQUIRED PARAMETERS:

vlist is a list of up to 999 variable names in the order desired to be listed. Abbreviated variable lists (using "-" or "--" notation) are NOT allowed. At least one space is required between each variable. Example: vlist=x y z

ofile is the filename of the output file which will contain the tabular formatted listing. Example (specific to Unix operating system): ofile=./testdata.txt. In addition to the WP output file above, there will be a PROC PRINT type listing generated in the .lst file or display manager window.

OPTIONAL PARAMETERS:

ds is the SAS data set containing the variables of interest. The last data set is used if nothing is specified. Example: ds=alcohol

fmt is the format of the numeric variables. Default is 8.2. Example: fmt=5.1

labels should be set to "y" if labels are present and desired in the output. The default is no (n) labels. Example: labels=y

overwrite should be set to "y" if the output file ought to be overwritten. The default is no (n). Example: overwrite=y

byvar is a listing of by variables with FORMATS AFTER EACH ONE REQUIRED. Example: byvar=gender \$1. oprtn \$oper.

header should be set to "n" if overwrite=n and you do not want another header to appear in the output file; otherwise, a header will appear by default. Headers are automatic if overwrite=y. Example: header=n

stats is a listing of desired statistics in the specified order of appearance in the output. Leave at least one space between each one. Example: stats=n mean sd se median min max mode t wsr norm. Default: stats=n mean sd median min max

EXAMPLE

See appendix A for a description of the data set.

SAS CODE:

```
%univ(vlist=before after,
ds=_LAST_,fmt=8.2,labels=y,ofile=filename,owrite=y,
byvar=,header=y,stats=n mean sd se median min max)

%univ(vlist=change,
ds=_LAST_,fmt=8.2,labels=y,ofile=filename,owrite=n,
byvar=,header=y,stats=n mean sd se median min max wsr)

%univ(vlist=before after,
ds=_LAST_,fmt=8.2,labels=y,ofile=filename,owrite=n,
byvar=sex $1.,header=y,stats=n mean sd se median min max)

%univ(vlist=change,
ds=_LAST_,fmt=8.2,labels=y,ofile=filename,owrite=n,
byvar=sex $1.,header=y,stats=n mean sd se median min max wsr)
run;
```

OUTPUT:

Output for the first macro call is as seen above in the introduction.

	N	MEAN	SD	SE	MEDIAN	MIN	MAX	WSR
Change	20	0.04	0.04	0.01	0.04	-0.02	0.11	0.002

	SEX	N	MEAN	SD	SE	MEDIAN	MIN	MAX
Before	F	10	0.72	0.10	0.03	0.71	0.59	0.88
	M	10	0.71	0.08	0.03	0.70	0.58	0.84
After	F	10	0.75	0.11	0.03	0.72	0.60	0.97
	M	10	0.76	0.10	0.03	0.75	0.62	0.92

	SEX	N	MEAN	SD	SE	MEDIAN	MIN	MAX	WSR
Change	F	10	0.03	0.05	0.01	0.01	-0.02	0.11	0.109
	M	10	0.05	0.04	0.01	0.05	-0.02	0.10	0.010

CONCLUSION

Tab delimited output can be created using base SAS software and easily imported into tables or a tabular format of a word processing package. Note that in some word processing packages, tabs need to be set ahead of importing the file, and "hard" tabs created by base SAS software may need to be globally replaced by the "soft" tabs of the word processing software package. Small fonts and/or small margins are recommended. Landscape may be necessary if a large number of statistics and p-values are chosen.

The author can be reached by internet at address ltuason@bio.ri.ccf.org, by mail at The Cleveland Clinic Foundation, T-40, 9500 Euclid Avenue, Cleveland, OH 44195, or by phone at 216-444-9815.

REFERENCES

Conover, W.J., (1980), *Practical Nonparametric Statistics*, 2nd edition, New York: John Wiley & Sons, Inc.

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APPENDIX A

```
/* Test data set from Conover (1980), p. 292.  
The below data consist of the reaction times of 20 subjects  
both before and after consuming alcohol. Descriptive statistics  
will be computed, and the Wilcoxon signed rank test (WSR) will be  
performed on the change in reaction time.
```

```
*/
```

```
data alcohol;  
input subject sex $ before after @@;  
change=after-before;  
label subject='Subject'  
sex='SEX'  
before='Before'  
after='After'  
change='Change';
```

```
cards;
```

1	M	.68	.73	11	F	.65	.72
2	M	.64	.62	12	F	.59	.60
3	M	.68	.66	13	F	.78	.78
4	M	.82	.92	14	F	.67	.66
5	M	.58	.68	15	F	.65	.68
6	M	.80	.87	16	F	.76	.77
7	M	.72	.77	17	F	.61	.72
8	M	.65	.70	18	F	.86	.86
9	M	.84	.88	19	F	.74	.72
10	M	.73	.79	20	F	.88	.97

```
;
```

```
run;
```