Getting Up to Speed with PROC REPORT

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ABSTRACT

Learning the basics of PROC REPORT can help the new SAS® user avoid hours of headaches. PROC REPORT can often be used in lieu of PROC TABULATE or DATA _NULL_ reporting--two areas that have driven the new SAS user crazy!!! With the added capabilities of ODS provided in Version 7 and Version 8, PROC REPORT can look as sharp as an EXCEL report. This paper will show how to use PROC REPORT in both a windowing and non-windowing environment.

WINDOWING ENVIRONMENT

To use PROC REPORT in the windowing environment, there are several options.

If your site has SAS/ASSIST®, you can get to PROC REPORT by choosing the following sequence of icons:

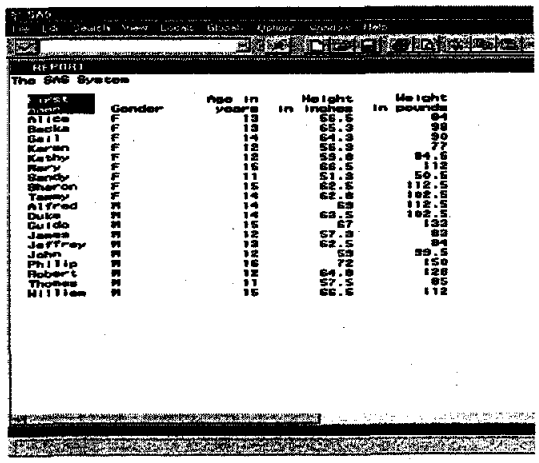
REPORT WRITING → DESIGN REPORT → Design a Report

If you do not have SAS/ASSIST, submit the following program from the program editor.

```
options nocenter;
proc report data=sasuser.class;
run;
```

Note: This paper will be using the CLASS data set provided as an example data set when you license SAS/ASSIST. See **Appendix I** for details on how to get access to this data set.

After submitting the program, the following screen will appear.



This screen is the default report. It looks very similar to "vanilla" PROC PRINT. The value of PROC REPORT is in its grouping capabilities, which include summarizing. The report will now be reorganized interactively to group by **GENDER**.

PROC REPORT works from left to right. Thus, if you want a grouping by GENDER, then you need to move GENDER before FIRST NAME. To reorder the report, highlight the GENDER label. Choose the following sequence either from the PMENU or by clicking the right mouse button.

Edit → Move selected item → to the left of the next selected item

Nothing seems to happen. The next step is to highlight the FIRST NAME label. The GENDER column should move to the left of FIRST NAME. The report should look the same, except for the column change.

Now you decide that all of the F's for females and M's for males are cluttering the report. You only want one F and one M to designate the group. To do this, follow the next sequence of push buttons.

Edit → Define selected item → Group → Apply → OK

Now you would like a line break between each grouping.

Edit → Summarize information → After detail lines → Skip line after break → OK

You will now proceed onto a more slightly difficult change. You would like to have the data sorted by age. Because PROC REPORT works from left to right, you cannot sort the AGE IN YEARS column with FIRST NAME to the left of it. To further complicate things, you really like where AGE IN YEARS is located. We need to have AGE IN YEARS have two columns on our report, but you do not want to see the column to the left of FIRST NAME. To do this, you will need to follow the next sequence after highlighting FIRST NAME:

Edit → Add report item → Data column → at left of selected item → AGE IN YEARS → File → End

The report now has two AGE IN YEARS columns, and you do not want that look. You will now need to sort the data and remove the new column from the report layout. To do this, highlight the new AGE IN YEARS column and do the following.

Edit → Define selected item → Order → No print → Apply → OK

Now you would like to get some summary statistics for the GENDER grouping and for an overall total.

To get the summary statistics for GENDER do the following:

Edit → Summarize information → After detail lines → Overline summary → Summarize analysis columns → Apply → OK

This will use the SUM calculation. The MEAN is the preferred summary statistic. To make this change, you will need to modify the height and weight columns. After highlighting HEIGHT IN INCHES, follow the sequence below.

Edit → Define selected item → change SUM to MEAN under STATISTICS **→ Apply → OK**

For an overall total, follow this sequence. Again, if you did not do the above step then the overall total will be the SUM calculation.

Edit → Summarize information → At bottom of report → Summarize analysis columns → Apply → OK

To do a little format clean up by lining up the decimal places to the right for HEIGHT IN INCHES and WEIGHT IN POUNDS, follow the sequence below.

Edit → Define selected item → enter 8.2 in format → **Apply → OK**

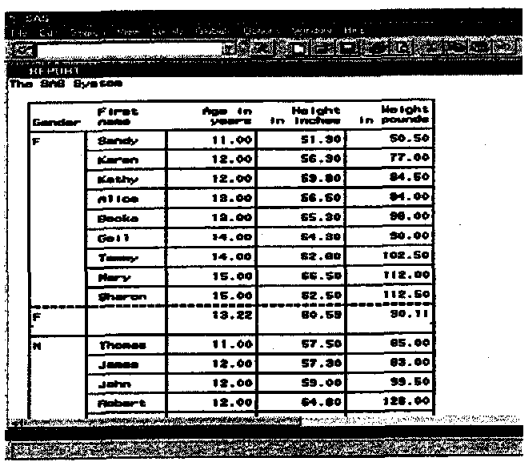
If you forget the format you want to use enter a **?** on the format field and modify the format screen.

Keep in mind that you could have gotten a similar looking report using PROC PRINT, but you also would have had to sort your data first. We have achieved an ordered report without sorting the data first—PROC TABULATE could have done something similar too.

Speaking of PROC TABULATE, you can have the boxed look with PROC REPORT too. For the final interactive option, turn on box.

Edit → Set report option → Box → OK

Your report hopefully looks like the following.



Gender	First name	Age in years	Height in inches	Weight in pounds
F	Sandy	11.00	51.50	50.50
	Karen	12.00	56.50	77.00
	Kathy	12.00	59.80	84.50
	Alice	13.00	56.50	84.00
	Becka	13.00	65.30	98.00
	Gail	14.00	64.80	90.00
	Tammy	14.00	62.80	102.50
	Mary	15.00	66.50	112.00
	Sharon	15.00	62.50	112.50
F		13.22	60.59	90.11
M	Thomas	11.00	57.50	85.00
	James	12.00	57.30	83.00
	John	12.00	59.00	99.50
	Robert	12.00	64.80	128.00

Now you would like to save the report statements that were generated from the interactive work to be used in our non-windowing environment. Following is the sequence that will return the code. **Locals → List REPORT statements → File → Save as → Write to file →** enter file name

NON-WINDOWING ENVIRONMENT

The SAS code that was generated from the interactive work in the windowing environment section is shown in Figure 1. Each line of code will be explained in detail.

The first line of code generated is PROC REPORT.

```
PROC REPORT DATA=SASUSER.CLASS LS=80
   PS=44  SPLIT="/" NOCENTER BOX ;
```

To work in a non-windowing environment, the **PROC REPORT** statement will need to be rewritten with the NOWINDOWS option.

```
PROC REPORT DATA=SASUSER.CLASS LS=80
   PS=44  SPLIT="/" NOCENTER BOX
   NOWINDOWS ;
```

Like other PROCs, you can designate the data to be used with a DATA= or default to the most recently created data set. In this example, a permanent SAS data set was used.

The remaining options are for formatting the overall report. The **split='/'** works the same way as PROC PRINT for labels on specific variables. The label will be split to a new line at the /. The **LS** and **PS** are exactly the same as those used in the global **OPTION** statement for linesize and pagesize, respectively. Note: PROC REPORT honors the

```
PROC REPORT DATA=SASUSER.CLASS LS=80  PS=44  SPLIT="/" NOCENTER BOX ;
COLUMN  SEX AGE NAME AGE=_A1 HEIGHT WEIGHT;

DEFINE  SEX / ORDER FORMAT= $1. WIDTH=6   SPACING=2   LEFT "Gender" ;
DEFINE  AGE / ORDER FORMAT= BEST9. WIDTH=9   SPACING=2   NOPRINT RIGHT
"Age in years" ;
DEFINE  NAME / ORDER FORMAT= $8. WIDTH=8   SPACING=2   LEFT "First name" ;
DEFINE  _A1 / SUM FORMAT= BEST9. WIDTH=9   SPACING=2   RIGHT "Age in years" ;
DEFINE  HEIGHT / SUM FORMAT= 8.2 WIDTH=9   SPACING=2   RIGHT "Height in inches"
;
DEFINE  WEIGHT / SUM FORMAT= 8.2 WIDTH=9   SPACING=2   RIGHT "Weight in pounds"
;

BREAK AFTER SEX / OL SKIP SUMMARIZE ;

RBREAK AFTER  / SUMMARIZE ;
RUN;
```

Figure 1 SAS code created from windowing environment.

first LS and PS that it finds. The **BOX** option outlines the detail lines of the report, similar to PROC TABULATE.

The **COLUMN** statement describes the arrangement of columns and headers.

```
COLUMN  SEX AGE NAME AGE=_A1 HEIGHT
   WEIGHT;
```

In this example, the COLUMN statement works like a VAR statement in PROC PRINT. This statement shows the order of the SAS variables that are to be processed and possibly printed. The **AGE=_A1** is the only unclear piece of code. _A1 is the alias for AGE. The DEFINE statement will further clarify the need and use of an alias.

The COLUMN statement can also provide detailed header information. You might want to have a special label across the HEIGHT and WEIGHT variables. To do this, the COLUMN statement needs to be rewritten as follows:

```
COLUMN  SEX AGE NAME AGE=_A1
  ('*Body Size*' HEIGHT WEIGHT);
```

The **DEFINE** statement specifies how to use the specific variable that was defined in the column statement. The variable can be either a SAS variable or a computed variable created in PROC REPORT.

The AGE and _A1 DEFINE statements will be used to explain how to use the DEFINE statement. Remember that _A1 variable is an alias of AGE. Because the report has AGE sorted within GENDER, the AGE variable needed to follow GENDER, but the report was to keep AGE in the same location as the original report. Thus, the DEFINE statement for AGE includes the option NOPRINT, along with the option of ORDER.

```
DEFINE  AGE / ORDER FORMAT= BEST9.
   WIDTH=9   SPACING=2   NOPRINT
   RIGHT "Age in years" ;
```

To begin a DEFINE statement, start with DEFINE followed by the report item and then a slash (/).

```
DEFINE  _A1 / MEAN FORMAT=8.2 WIDTH=9
  SPACING=2   RIGHT "Age in years" ;
```

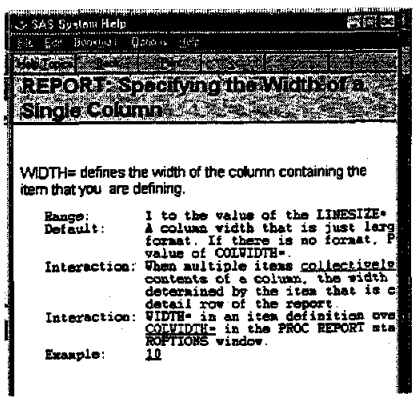
The report item for this example is _A1. The report item can be a SAS variable, computed variable, or an alias of either of these two variables.

After the slash, there are many options. Some of these options are obvious, but others are better understood with a SAS manual or on-line help. The on-line **SAS System Help** for PROC REPORT is very helpful. To get to HELP on PROC REPORT from SAS 6.12, type HELP REPORT on the command line. (As you might guess, there are many ways to get to HELP while using interactive SAS.) For version 7 or version 8, you will need to Internet Browser.

To find out what the **WIDTH** option does, enter the following sequence:

Syntax → Define → <attribute(s)>
Width=column-width

The following screen should appear.



The **BREAK** and **RBREAK** statement work in a similar manner, and so, they will be discussed together. The **BREAK** statement allows for a break at a grouped or ordered variable. The break can be a summary line, page break, or a line space. It can be before or after the grouped data. The **RBREAK** statement is a summary line for the completed report. It can be at the start or end of the report.

CONCLUSION

PROC REPORT is a very powerful tool that is also easy to use. This paper has explored generating SAS code using PROC REPORT in an interactive mode, and then later modifying that code to work in a non-windowing environment.

One area that was not covered in this paper that could also increase your speed in generating PROC REPORT code is to add PROMPT to the following code:

```
proc report data=sasuser.class
     prompt;
run;
```

APPENDIX I

The CLASS data set used in this paper is provided with SAS/ASSIST. To have the data saved in your SASUSER library, click on the following sequence of icons/menus:

SETUP → Sample data sets... →
Create sample data sets... →
Select CLASS → OK

REFERENCES

Ewing, D. and Pass, R. (1999), *So Now You're Using PROC REPORT. Is it Pretty and Automated?* Proceedings of the Twenty-Fourth Annual SAS® Users Group International Conference, Cary, NC: SAS Institute Inc:, 871-880.

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Pass, R. and Ewing, D. (1999), *So Now You're Still Not Using PROC REPORT. Why Not?* Proceedings of the Twenty-Fourth Annual SAS® Users Group International Conference, Cary, NC: SAS Institute Inc., 861-870.

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