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Finding Your Way Around a SAS® Generated Report

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ABSTRACT

Using the procedures of the SAS system, we can and do generate hundreds of tables. The Output Delivery System easily renders these tables in rich text format. Navigating around the resulting report would be quite daunting if not for the Microsoft Word Table-of-Contents tool. Before you can use this tool profitably, careful attention must be paid to the Word settings and the SAS program that creates the tables. Appropriate use of the CONTENTS option and the ODS PROCLABEL statement must be made to achieve a useful result. Using these options along with PROC REPORT, we will demonstrate how to generate a clear and definitive table-of-contents in your report. This method will then be extended to other procedures, like PROC PRINT and PROC TABULATE.

INTRODUCTION

In my company, we use the SAS system to create databases for and analyze data from clinical trials. This process leads to hundreds, if not thousands, of pages of reports. Most of our clients want these reports delivered in Microsoft Word format. Using the Output Delivery System (ODS), we can easily route our output from SAS into a rich-text-format (RTF) document for use by Word. When the client asks which page of the hundred page report contains the Medical History table, however, we have a potential problem.

TABLE OF CONTENTS

Whenever we are confronted with a large book or report, the first thing that we might consult is the table-of-contents (TOC): This contains the titles of sections and tables and the associated page numbers. Our SAS generated report may initially not have such a table, but if the report is created with ODS, a table can be made with the appropriate options on the statement used to create the report:

```
ods rtf file ="c:\path\OutReport.rtf" contents toc_data;
```

All that you have to do is open up the report in Microsoft Word and update the TOC field. However, we rarely use this method.

Before a report is sent to a client, the output generated by the programmer is often edited, rearranged and regrouped. Furthermore, the client may or may not want a TOC. Consequently, we leave it up to the administrative staff to insert any desired content listing.

WORD TOC

Using features of Word to create a TOC is somewhat more involved than the one SAS statement, but is still straightforward:

1. Load the document that you created with SAS into Word.
2. Next decide where you want the TOC. You will usually want this at the beginning of a document on a page of its own. Create a new page if necessary and move the cursor to the point you want the TOC to appear.
3. Choose Insert from the toolbar.
4. Pick Reference from the drop down menu.
5. Now select Index and Tables...
6. Choose the Table of Contents tab.

In the TOC Window, if you press the OK button, Word will attempt to insert a TOC at the position of the cursor. If we do this now however, you will probably get nothing! If instead of pressing OK, you choose the Options... button, you will notice that the Outline levels is checked. SAS ODS outputs everything into tables. Thus, this Outline method has no effect on TOC creation. However, the SAS system creates a unique bookmark at each table that it produces. So we should continue the above instructions with

7. Press the Options... button.
8. In the option window, the Table entry fields must be checked. Entry fields are another name for the Word bookmarks.
9. Press OK to close the options window.
10. Press OK in the main TOC Window.

Word will list every table with bookmark in a TOC. If your report contains thousands of tables, you must be patient. WORD may take some time in this indexing process.

The TOC that you just produced is complete, except the information is not very useful. The SAS procedures will list their name repeatedly with similar sub-listings. For example if you use PROC REPORT to produce all of the tables in your report, your TOC would look something like

Report.....	1
Detailed and/or summarized report.....	1
Report.....	2
Detailed and/or summarized report.....	2
Report.....	3
Detailed and/or summarized report.....	3

This would go on line after line until all of the tables created in the report were listed. We now know where all the tables are, but we have no idea what is in them.

BACK TO SAS

The line "Report" is the name of the SAS Proc used. All SAS PROCEDURES have an associated name. In most uses by programmers this name is irrelevant. Only when you are creating a TOC does it become an issue. However, the ODS system provides a quick and easy solution to this problem. You can give the PROC a name of your choosing by writing

```
ods proclabel="My Label";
```

This line should be placed before each and every procedure that you want to rename, with an appropriate text string. Consequently, in our SAS report programming, we always use this line to provide the report table with a descriptive name. For example, we would assign the PROCLABEL to 'Table 1 Demographics' and similarly for other tables. If we now run the SAS report program and the TOC procedure, we would get

Table 1 Demographics.....	1
Detailed and/or summarized report.....	1
Table 2 Treatment Status.....	2
Detailed and/or summarized report.....	2
Table 3 Surgical History.....	3
Detailed and/or summarized report.....	3

So we now know where every table is but we still have the annoying sub-listing. You could go into Word and go to the TOC Options window and choose 1 header line, but this will have no effect. Instead we must alter the PROC code that generated the tables. For PROC REPORT, we would write

```
ods proclabel='Table 1 Demographics';
proc report data=level11.demog
```

```

contents=" ";
{More statements}
run;

```

where we have added the " CONTENTS=' ' " option to the PROC REPORT statement. If we did this for all of our tables we would now get

Table 1 Demographics.....	1
Table 2 Treatment Status.....	2
Table 3 Surgical History.....	3

This is exactly what we want. If you wanted a sub-listing on each line you could have inserted the appropriate phrase into the CONTENTS option. For most reporting, we stick with one line of information in the TOC.

MULTIPAGE TABLES

Sometimes our clients want complicated multipage tables. In the demographics, it is not uncommon for the first page to be a table of the distribution of the population gender and race. For the second page, we may have a summary of the age and for the third page we might have a summary of the height and weight. Although it is on three pages the client still calls this the demographics table. For simplicity of programming and pagination of the output, each page of such a table is coded with a separate PROC REPORT. Our TOC process might now produce

Table 1 Demographics.....	1
Table 1 Demographics.....	2
Table 1 Demographics.....	3
Table 2 Treatment Status.....	4
Table 3 Surgical History.....	5

We could have altered our PROCLABEL to something like Demographics (1 of 3) or maybe Demographic (continued). However, we really do not need an entry for each page of a table. One entry will do. If we do not use an ODS PROCLABEL statement for all but the first page, we would end up with the SAS default output in our TOC. To solve this problem, following the "CONTENTS=' ' " lead, we set the PROCLABEL for the pages to blank:

```
ods proclabel=' ';
```

If we now run our report program, the TOC process will yield

Table 1 Demographics.....	1
Table 2 Treatment Status.....	4
Table 3 Surgical History.....	5

Our TOC is now finished.

OTHER PROC

For nearly all of our reporting, PROC REPORT is the tool of choice. Output from statistical procedures is usually captured and selective information is extracted and presented in a form the client desires. However, occasionally we

use PROC PRINT or PROC TABULATE as an output tool. Happily the method for creating a useable TOC from these procs is very similar to that of PROC REPORT.

PROC PRINT

We write the code as we did for PROC REPORT:

```
ods proc label='Listing 1 Demographics';
proc print data=level1.demog contents=' ';
    {more statement}
run;
```

We will get similar results:

Listing 1 Demographics.....	1
Listing 2 Treatment Status.....	4
Listing 3 Surgical History.....	5

However, unlike PROC REPORT, removing the CONTENTS option does produce an interesting result:

Listing 1 Demographics.....	1
Data Set LEVEL1.DEMOG.....	1
Listing 2 Treatment Status.....	4
Data Set LEVEL1.TREAT.....	4
Listing 3 Surgical History.....	5
Data Set LEVEL1.SURGHIST	6

The 2-level name of the data set that is listed by PROC PRINT is given as the second entry. This can be quite useful in making sure that you are really printing the correct file.

PROC TABULATE

As with PROC REPORT and PROC PRINT, we could write

```
ods proclabel='Table 9 Vital Signs';
proc tabulate data=level1.vs contents='';
    {more statement}
run;
```

We might get a TOC containing lines like

Table 9 Vital Signs.....	33
Part 1.....	33
Table 10 Medications.....	36
Part 1.....	36
Table 11 Physical Characteristics.....	40
Part 1.....	40

We get an extra line for each entry in our TOC! Unlike PROC REPORT which can only generate one report or PROC PRINT which can only dump one data set, PROC TABULATE can have several TABLE statements and subsequently output each one with a different entry in the TOC. These extra entries can easily be eliminated by adding another CONTENTS option to the TABLE statement:

```
ods proclabel='Table 9 Vital Signs';

proc tabulate data=levell.vs contents='';
    {more statement}
    table systolic, n mean std/contents=' ';
run;
```

If you use several table statements in your PROC TABULATE merely replace the CONTENTS=" with a descriptive name for each table.

CONCLUSIONS

Regardless of how voluminous your report is, you can easily find your way around it if you have a table-of-contents. Microsoft Word provides the tools for creating this. The SAS Output Delivery Systems offers the bookmarking feature that exploits this. By an appropriate use of the ODS PROCLABEL statement and the "CONTENTS=" option within the output procedure, we can create custom table-of-contents entries or suppress them. This method is simple and straightforward and works very similarly for PROC REPORT, PROC PRINT, and PROC TABULATE.

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CONTACT INFORMATION

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