With a Trace: Making Procedural Output and ODS Output Objects Work For You

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trace[1] (trs)

n.

1.

a. A visible mark, such as a footprint, made or left by the passage of a person, animal, or thing.

b. Evidence or an indication of the former presence or existence of something; a vestige.

2. A barely perceivable indication; a touch: spoke with a trace of sarcasm.

3.

a. An extremely small amount.

b. A constituent, such as a chemical compound or element, present in quantities less than a standard limit.

4. A path or trail that has been beaten out by the passage of animals or people.

5. A way or route followed.

6. A line drawn by a recording instrument, such as a cardiograph.

7. *Mathematics*

a. The point at which a line, or the curve in which a surface, intersects a coordinate plane.

b. The sum of the elements of the principal diagonal of a matrix.

8. An engram.

Introduction

Most SAS procedures generate ODS objects behind the scenes. SAS uses these objects in conjunction with style templates that have custom "buckets" for certain types of output to produce the output we see in all destinations. Using ODS output objects and output data sets can be an enormous time saver. Here's how to put the pieces together!

4 Easy Steps

1. *Identify / locate your ODS output object(s) using ODS TRACE or output data set(s) .*
2. *Analyze your ODS output object(s) or output data set(s) using basic SAS procedures and review.*
3. *Manipulate your ODS output object(s) or output data set(s) using SAS data steps, and/or procedures.*
4. *Report on your final data set.*

Contact Information

Your comments and questions are valued and encouraged. Contact the author at: louise_hadden@abtassoc.com

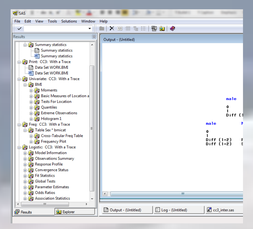
Two full sample programs, one designed to be run interactively, and one designed to be run in batch mode, are provided in the proceedings. These programs use the SASHELP.CLASS data set provided with SAS software. Code snippets are provided in the text of the paper in the proceedings.

See the paper in the proceedings for more details!

1. Using ODS Trace

Use the ODS TRACE command to identify ODS output objects. Choose the procedure that you are using, and "surround" the procedure (including any ODS GRAPHICS calls, etc. you may be using) with ODS TRACE and ODS TRACE OFF commands.

```
ODS TRACE ON / LABEL;
ODS RTF FILE="yourfilename.rtf"
 PATH=odsout;
ODS GRAPHICS ON;
. . . your procedures here . . .
ODS RTF CLOSE;
ODS GRAPHICS OFF;
ODS TRACE OFF;
```



If you are running interactively, you will see the ODS objects generated in the results window on the left, and can select, view, sometimes edit and save these objects. Although the ODS objects can be viewed in the results window, you will not get enough information about the objects to truly customize your output. If you run in either mode, output from the ODS TRACE command will be included in your log file.

After running a program you can review our log and identify all the output objects generated by a specific procedure and learn its system name (sample programs provided in proceedings).

2. Exploring ODS Output

cc3_batch.log - Notepad

File Edit Format View Help

```
107
108        proc logistic data=bmi descending;
109            model moderate=male height weight age;
110        title2 'Logistic - Moderate BMI as dependent variable';
111        run;

Output Added:
-------------
Name:       ModelInfo
Label:      Model Information
Template:   Stat.Logistic.ModelInfo
Path:       Logistic.ModelInfo
Label Path: 'The Logistic Procedure'.'Model Information'
-------------

Output Added:
-------------
Name:       NObs
Label:      Observations Summary
Template:   Stat.Logistic.NObs
```

PROC LOGISTIC (log snippet shown above) generates many ODS output objects (datasets) that go into the "print" output: ModelInfo, Nobs, ResponseProfile, ConvergenceStatus, FitStatistics, GlobalTests, ParameterEstimates, OddsRatio, and Association. These datasets are not on the same level and in order to create a single data set from the various pieces, more exploration is needed. To save these temporary files to either work or permanent data sets, use the ODS OUTPUT statement.

2. Exploring ODS Output (continued)

```
ODS OUTPUT
modelinfo=modelinfo nobs=nobs responseprofile=responseprofile
convergencestatus=convergencestatus
fitstatistics=fitstatistics globaltests=globaltests
parameterestimates=parameterestimates
oddsratios=oddsratios association=association;
  PROC LOGISTIC . . .
ODS OUTPUT CLOSE;
```

It is recommended that you do a test print of 10 observations even if you are working with a small data set, otherwise your output could be very large.

Variable	*DF*	*Estimate*	*StdErr*	*WaldChiSq*	*ProbChiSq*
Intercept	1	-0.5111	3.5321	0.0209	0.8849
male	1	0.8934	0.6131	2.1238	0.1450
Height	1	-0.0168	0.1049	0.0257	0.8728
Weight	1	0.0154	0.00721	4.5349	0.0332
Age	1	-0.1560	0.3291	0.2246	0.6355

The contents is also very important as fields which might appear to be numeric may be character – a PROC CONTENTS gives you valuable information for further manipulations.

Variables in Creation Order

#	*Variable*	*Type*	*Len*	*Format*	*Label*
1	Variable	Char	9		
2	DF	Num	8	2.	
3	Estimate	Num	8	D8.	
4	StdErr	Num	8	D8.	Standard Error
5	WaldChiSq	Num	8	10.4	Wald Chi-Square
6	ProbChiSq	Num	8	PVALUE6.4	Pr > Chi-Square

3. Manipulate ODS Output

Pick and choose statistics from various ODS output data sets for a procedure and manipulate so that data sets are on same level. It becomes a simple exercise to report on the designer logistic data set.

IDX | CC3: With a Trace

CC3: With a Trace
Logistic Manipulated Output

rowcat	rownum	description	rowdesc	OddsRatioEst	ProbChiSq
1	1	male	Binary: Male	2.443	0.145
1	2	Height	Height in Inches	0.983	0.8728
1	3	Weight	Weight in Pounds	1.015	0.0332
1	4	Age	Age in Years	0.856	0.6355

Optional: merge with a descriptive data set which may include longer variable descriptions and variables used to format.
Optional: create macro variables for printing from some ODS OUTPUT objects using CALL SYMPUT.

4. Report on "Designer" Data Set

Table 1. Selected Characteristics by BMI Category

Characteristic	*Total 2005*	*Total 2005*	*Chi Squared P-Value*	*Underweight (BMI<18.5)*	*Normal Weight (BMI 18.5-24.9)*	*Overweight (BMI 25-29.9)*	*Obese (BMI 30+)*
Total Sample	**15,195 (946,008)**	**100.0±0.00**	**NA**	**1.2±0.14**	**38.3±0.82**	**47.6±0.68**	**12.9±0.55**
Sex							
Men	11,395 (804,888)	85.1±0.71	<.0001	0.9±0.16	35.2±0.94	50.2±0.79	13.7±0.61
Women	3,800 (141,120)	14.9±0.71	<.0001	2.8±0.30	56.1±1.24	32.9±1.01	8.2±0.63
Age							
17-20	1,187 (130,680)	13.8±0.99	<.0001	1.6±0.40	53.8±1.95	37.9±1.78	6.7±1.35
21-30	6,180 (481,590)	50.9±1.21	<.0001	1.5±0.21	42.4±0.98	44.7±0.96	11.4±0.58
31-39	4,610 (230,112)	24.3±1.05	<.0001	0.6±0.17	26.9±1.22	54.8±0.91	17.7±0.85
40+	3,218 (103,627)	11.0±0.75	<.0001	0.7±0.20	25.2±1.15	57.2±1.22	16.9±0.98
Educational Attainment							
High School or Less	4,409 (352,500)	37.3±1.56	<.0001	1.1±0.26	43.9±1.26	41.8±0.95	13.3±0.93
Some College	6,146 (380,144)	40.2±1.26	<.0001	1.6±0.20	34.5±0.80	49.7±0.79	14.2±0.67
College Degree or More	4,640 (213,365)	22.6±1.75	<.0001	0.8±0.21	35.8±1.35	53.4±1.32	10.0±0.77
Race/Ethnicity[a]							
White/Non-Hispanic	9,443 (618,460)	65.4±1.28	<.0001	1.1±0.16	39.6±0.95	48.0±0.90	11.3±0.61
Black or African American/Non-Hispanic	2,413 (162,491)	17.2±1.06	<.0001	1.7±0.39	31.8±1.45	46.1±1.29	20.4±1.33
Asian	589 (30,609)	3.2±0.51	<.0001	2.1±0.94	53.6±3.00	39.3±3.26	5.0±1.50
Hispanic or Latino[d]	1,831 (80,798)	8.5±0.46	0.2804	0.9±0.26	35.9±1.76	50.3±1.87	12.9±1.06
Other	919 (53,651)	5.7±0.28	0.9841	1.2±0.45	37.8±2.26	47.6±2.15	13.4±1.64
Marital Status							
Married or Living as Married/Partners	9,531 (522,210)	55.2±1.34	<.0001	1.0±0.15	32.5±1.03	51.0±0.84	15.6±0.58
Single, not living as married or with partner	5,664 (423,798)	44.8±1.34	<.0001	1.5±0.25	45.5±0.97	43.4±0.86	9.6±0.64