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TLFs
Replaying Rather than Appending

William Coar, PhD
Denver SAS User Group

Outline

- Motivation
- Current Setting
- SAS via ODS Document
- Moving Forward

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Current Setting

- Programming in SAS
- May not be simultaneously executed
- Periodically re-execute a set of programs
- Tables, listings, and figures in individual files
  - RTF, LST, PDF
- Desire a single file
  - Electronic review
  - Document management/distribution

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Existing Methods

- Involve Dynamic Data Exchange, manipulation of RTF tags, Visual Basic, and/or other manual intervention
- Programming done within and/or outside of SAS
- Been thoroughly discussed elsewhere
  - PharmaSUG 2012, WUSS 2012, among many others

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ODS Document

- Two step approach that requires thorough planning
- Step 1: ODS Document
  - SAS saves *data and instructions* when producing each report in an item store

Step 2: Proc Document

- Recall the data and instructions from within SAS via Proc Document
- Replay each report into a single RTF or PDF

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ODS Document

- Requires thorough planning
- SAS saves *data and instructions* when producing each report in an item store
  - Proc report, proc sgrender, etc.
- Recall the data and instructions from within SAS via Proc Document
- Replay each report into a single RTF or PDF

ODS Document

- Example: Sample Open DMC Report in Word
- Example: Sample Closed DMC Report in Word
- Example: Sample Closed DMC Report in PDF

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ODS Document Details

- Most (of our) reports are from Proc Report or Proc SGRender
- Individual programs
  - ODS Document statement prior to final Proc
  - Modify Proc with text for Table of Contents (CONTENTS= or DESCRIPTION=)
  - ODS Document Close
- ODS Document statement to create item stores
- Location defined by LIBNAME statement

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ODS Document Details

- Additional Proc Report requirements
  - Create a dummy order variable to be first in the COLUMN statement
  - Add BREAK BEFORE statement to reset CONTENTS=

Proc Document

```
ODS Document name=istore.&PGRM (write);

proc report data=tns_rpt center headline headskip
  nowindows missing
  contents="Table 1: Subject Disposition";

  column flag sv1 sv2 row1 _1 _2 _3;

  define flag       /order order=data noprint ;
  Other define statements

  break before flag / page contents='';
  run;
  ods document close;
```

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Proc Document

- Appended report
  - Combine all permanent item stores into a single item store
  - Replay newly created item store with desired sectioning
- Details are in Lawhorn (2011)
- Can change the ODS style
- Use ODS destination options for bookmarks and table of contents

Proc Document

- To see what is inside:

```
proc document name=istore.rdisp_open;
list / levels=all;
run;
quit;
```

- To replay the report:

```
* Define titles/footnotes;
ods rtf….
proc document name=istore.rdisp_open;
replay Report#1;
run;
quit;
ods rtf close;
```

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What's Inside?

The SAS System

of: \lstore.Rdisp_open\
: Insertion
f levels: All

	Path	Type
	\Report#1	Dir
2	\Report#1\Report#1	Dir
3	\Report#1\Report#1\Report#1	Table

Proc Document

- Creating an item store containing 2 tables

```
proc document name=work.app(write);
  copy \istore.table1\Report#1 to ^;
  copy \istore.table2\Report#1 to ^;
  list / levels=all;
Run;
Quit;
```

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Proc Document

of: \Work.App\
: Insertion
f levels: All

	Path	Type
	\Report#1	Dir
2	\Report#1\Report#1	Dir
3	\Report#1\Report#1\Report#1	Table
4	\Report#2	Dir
5	\Report#2\Report#1	Dir
6	\Report#2\Report#1\Report#1	Table

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Proc Document

```
proc document name=work.app(write);
  copy \istore.table1\Report#1 to ^;
  copy \istore.table2\Report#1 to ^;
  move Report#2\Report#1 to Report#1;
  delete Report#2;

  setlabel report#1 “Tables“;

…

Run;
```

NOTE: See Lawhorn (2011) for thorough discussion.

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Proc Document

The SAS System

of: \Work.App\
: Insertion
f levels: All

	Path	Type
	\Report#1	Dir
2	\Report#1\Report#1	Dir
3	\Report#1\Report#1\Report#1	Table
4	\Report#1\Report#2	Dir
5	\Report#1\Report#2\Report#1	Table

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Proc Document

The SAS System

of: \Work.App\
: Insertion
f levels: All

	Path	Type
	\Report#1	Dir
2	\Report#1\Report#1	Dir
3	\Report#1\Report#1\Report#1	Table
4	\Report#1\Report#2	Dir
5	\Report#1\Report#2\Report#1	Table
6	\Report#3	Dir
7	\Report#3\Report#1	Dir
8	\Report#3\Report#1\Report#1	Table
9	\Report#3\Report#2	Dir
9	\Report#3\Report#2\Report#1	Table
	\Sgrender#1	Dir
2	\Sgrender#1\SGRender#1	Graph
3	\Sgrender#1\SGRender#2	Graph

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Proc Document

```
ods rtf file="&PGRM..rtf" style=axioToC
  path="&PROJROOT.\TLFS" nogfootnote nogtitle
  contents=on toc_data;

proc document name=work.app;
replay Report#1;
* Replay any addition sections.;
Replay Report#k;
Replay SGRender#1;
run;
quit;

ods rtf close;
```

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Two Step Approach

- Pros
  - Not actually post processing individual RTF or PDF
  - Very stable so far
  - Don’t require additional software or processing in other languages
  - ToC in RTF
  - Correct bookmarking in PDF
- Cons
  - Minor\tedious programming tricks
  - Not much published for our current setting

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Thank You!

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