

 THE POWER TO KNOW.




## Have It Your Way: Rearrange and Replay Your Output with ODS Document

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 THE POWER TO KNOW.

## Today's Topics

- Overview of ODS Document
- Uses for ODS Document
- Creating, Managing and Replaying an ODS Document
- Using Proc Document

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(search by title, not author)

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## Today's Topics

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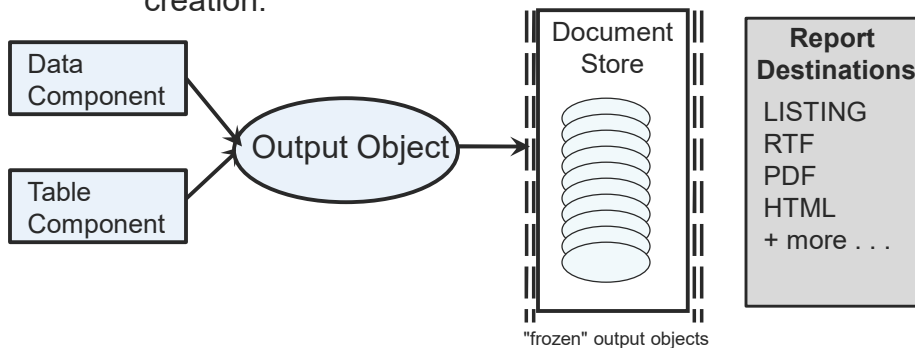
<https://www.basug.org/archives>

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## What is an ODS Document?

- ODS DOCUMENT is an ODS destination.
- ODS DOCUMENT is a "data" destination, not a report destination. Output objects are stored in their "raw" form, as if they were frozen between procedure completion and ODS result file creation.



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## What is an ODS Document?

- ODS DOCUMENT destination
  - holds output objects that are based on a SAS procedure or process in their original creation hierarchy
  - allows management and restructuring of output objects by GUI interface or batch syntax
  - allows ODS documents to be replayed to ODS report destinations.

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## What is an ODS Document?

- ODS documents are stored in a proprietary format (a document store) and can be viewed only with SAS software.
- To view or modify what's in the document store, you have to use either the ODS DOCUMENT window or PROC DOCUMENT.

Search Companion x

Name	In Folder	Size	Type
prddoc.sas7bitm	C:\temp\output	41 KB	SAS Item Store

Search by any or all of the criteria below.

All or part of the file name: \*prddoc\*.\*

A word or phrase in the file:

Look in: Local Hard Drives (C:)

An ODS document store is an item store like the SAS registry or a template store. On the Windows operating system, a document store has a file extension of 'sas7bitm'.

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## What is PROC DOCUMENT?

- PROC DOCUMENT is an interactive procedure that provides batch syntax to
  - create, manage, rearrange and replay ODS Document stores
  - open and list objects in a document store
  - display or replay output to any open ODS report destination without rerunning the SAS program(s) that created the output objects.

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## Creating a Document Store

```

ods document name=work.prddoc(write);
proc tabulate data=prdsale;
  by Country;
  var predict;
  class prodtype;
  table prodtype all,
         predict*(min mean max);
run;

ods select ExtremeObs;
proc univariate data=prdsale;
  by Country;
  var actual;
run;
ods document close;
    
```

demo1\_make\_odsdoc.sas

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## Results Window

The screenshot shows the SAS Results Window with a tree view on the left and a 'Properties of Table:' pane on the right. The tree view shows a hierarchy: Results > Tabulate > Country=CANADA > Cross-tabular summary report > Table 1. The 'Properties of Table:' pane shows the following details:

Attribute	Value
Type	Document
Name	Table
Description	Table 1
Path	Tabulate#1.ByGroup1#1.Report#1.Table#1
Created	3/20/2009 12:15 AM
Document	Work.Prddoc
Document Path	\Tabulate#1\ByGroup1#1\Report#1\Table#1

Although you see a document icon in the SAS Results Window after creating the document store, you must use either PROC DOCUMENT or the Document Window to view the objects in the document store.

demo1\_make\_odsdoc.sas

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## Batch Syntax to View the Document Store

```
ods listing;

proc document name=work.prddoc;
  list / levels=all;
run;
quit;
```

demo2\_investigate\_replay.sas

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## LIST Statement Results

Listing of: \Work.Prddoc\  
Order by: Insertion  
Number of levels: All

Obs	Path	Type
1	\Tabulate#1	Dir
2	\Tabulate#1\ByGroup1#1	Dir
3	\Tabulate#1\ByGroup1#1\Report#1	Dir
4	\Tabulate#1\ByGroup1#1\Report#1\Table#1	Table
5	\Tabulate#1\ByGroup2#1	Dir
6	\Tabulate#1\ByGroup2#1\Report#1	Dir
7	\Tabulate#1\ByGroup2#1\Report#1\Table#1	Table
8	\Tabulate#1\ByGroup3#1	Dir
9	\Tabulate#1\ByGroup3#1\Report#1	Dir
10	\Tabulate#1\ByGroup3#1\Report#1\Table#1	Table
11	\Univariate#1	Dir
12	\Univariate#1\ByGroup1#1	Dir
13	\Univariate#1\ByGroup1#1\ACTUAL#1	Dir
14	\Univariate#1\ByGroup1#1\ACTUAL#1\ExtremeObs#1	Table
15	\Univariate#1\ByGroup2#1	Dir
16	\Univariate#1\ByGroup2#1\ACTUAL#1	Dir
17	\Univariate#1\ByGroup2#1\ACTUAL#1\ExtremeObs#1	Table
18	\Univariate#1\ByGroup3#1	Dir
19	\Univariate#1\ByGroup3#1\ACTUAL#1	Dir
20	\Univariate#1\ByGroup3#1\ACTUAL#1\ExtremeObs#1	Table

demo2\_investigate\_replay.sas

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## Replaying All Output Objects

```
ods html file='c:\temp\replay_all.html'
      style=sasweb;
ods pdf file='c:\temp\replay_all.pdf';
proc document name=work.prddoc;
  replay;
run;
quit;
ods _all_ close;
```

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**REPLAY Statement Results**

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**Viewing the Document Store Interactively**

To open the Document Window, use one of these two methods:

Select **View** → **Documents** from the View menu

OR

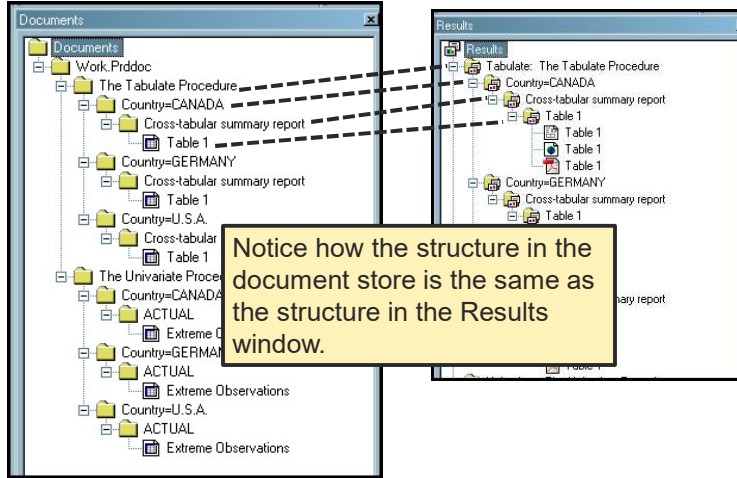
type 'odsdocument' or 'odsdoc' in the command area.

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## The ODS Document Window

- The ODS Document window provides a GUI window to explore an ODS Document store.

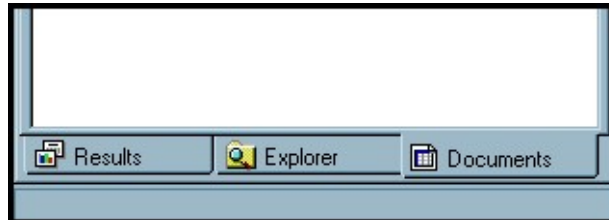


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## Docked View

- The ODS Document window, when open, is usually docked with the SAS Explorer window and the SAS Results window.
- The ODS Document window is not available with SAS Enterprise Guide. However, the PROC DOCUMENT batch syntax can be used with Enterprise Guide.



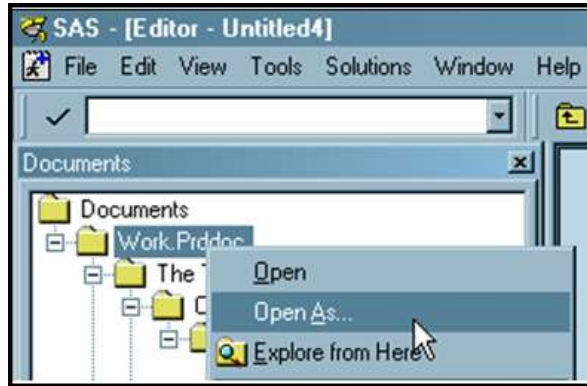
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## Replay an ODS Document Interactively

To replay an entire Document store, right-click on the store name and select **Open As...**

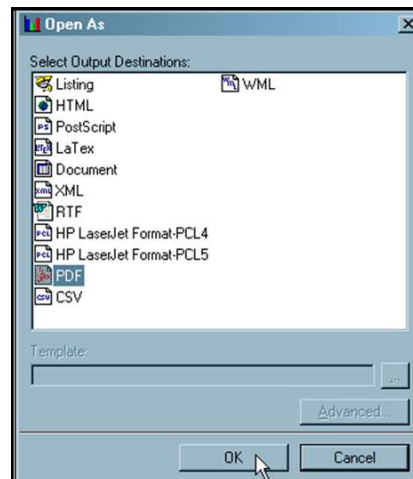


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## Select a Destination

- You may choose a destination from the Open As dialogue box. (Choose multiple destinations with Ctrl + Click.)

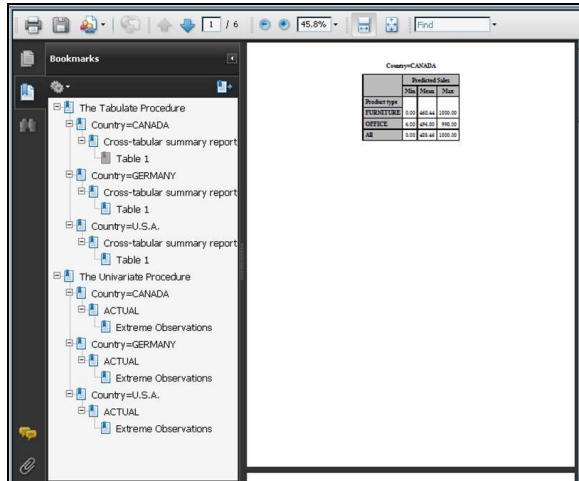


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## PDF Results

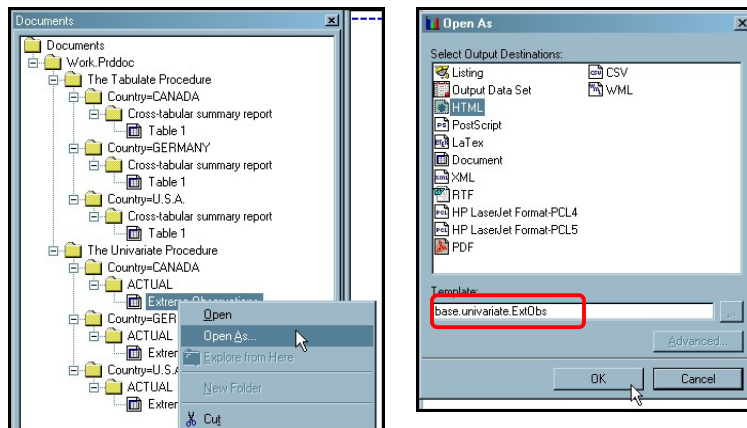
- The final PDF results show the ODS Document structure, which is the same as the original structure.



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## Replaying Selected Objects

- You do not have to replay the entire document store, you can also replay selected objects in the document store.



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## HTML Output for ExtremeObs Object

- The single object was replayed from the document store.

The screenshot shows the SAS Documents window on the left with a tree view. The path is: Documents > Work.Prddoc > The Univariate Procedure > Country=CANADA > ACTUAL > Extreme Observations. A context menu is open over 'Extreme Observations' with 'Open' selected. An arrow points from this menu item to the right-hand screenshot.

The right-hand screenshot shows the HTML output for the 'Extreme Observations' object. It is titled 'The UNIVARIATE Procedure Variable: ACTUAL (Actual Sales)' and 'Country=CANADA'. The data is presented in a table:

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
3	377	995	74
5	121	995	195
6	296	997	239
8	127	999	2
9	299	1000	455

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## Creating a New Document Store Interactively

- To create a new ODS document in this document store, highlight the word 'Documents' at the top of the Document window and select **New Document** from the menu.

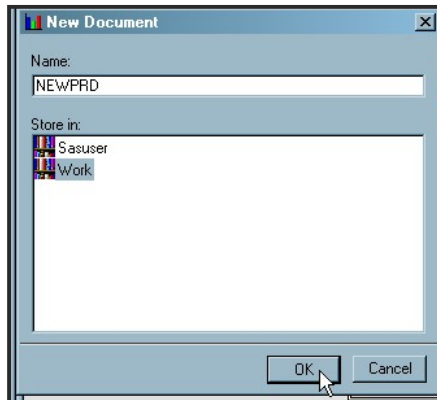
The screenshot shows the SAS Documents window. The 'Documents' folder at the top of the tree view is selected. A context menu is open over it, and the 'New Document' option is highlighted by the mouse cursor.

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## Providing Document Information

- When the New Document window opens, select a library to store the new document store and provide a name for the document store, NEWPRD, for example. Then, click **OK**.

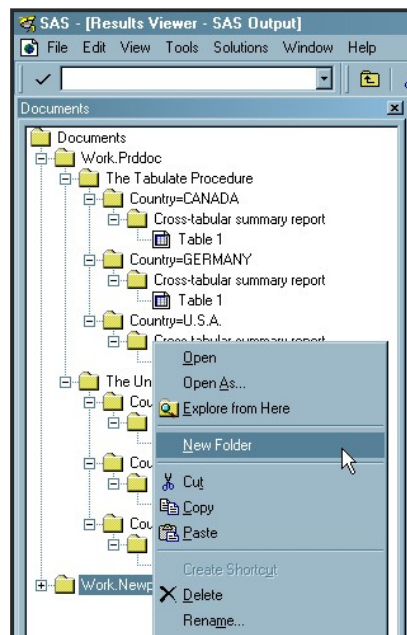


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## Creating a New Folder

- To create a folder in the new document store, highlight the name of the new document store, right-click, and select **New Folder**.

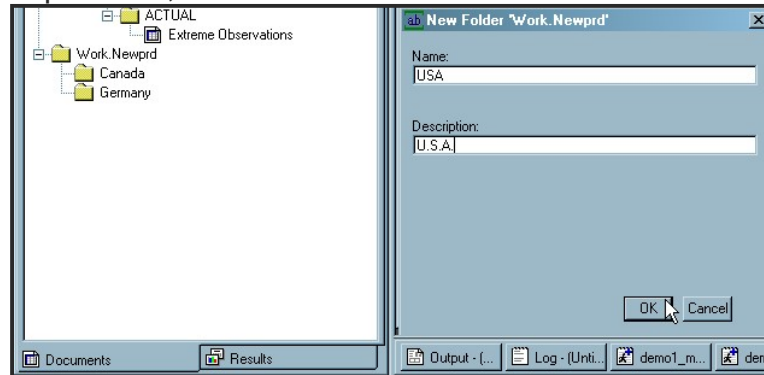


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## Create the New Folder Structure

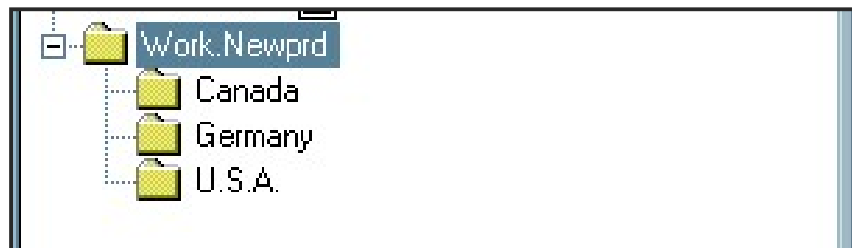
- Enter the country and the description in the New Folder window and then select OK. Folders for Canada and Germany were already created prior to this screen shot for the creation of the U.S.A. folder. Note that if a Description value is provided, it will be the value used.



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## New Folders Created

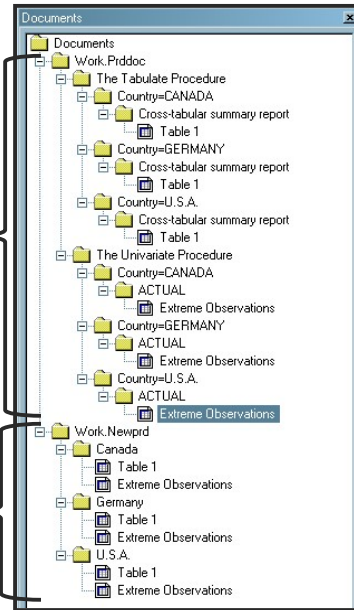
- The folder with all three countries is shown here. Even though the folders are expanded, they have no objects, so there is nothing to show in the expanded view.



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## New Document Structure

- If your company requires any type of audit trail of output or if you might ever need to reproduce the original report, you should keep an archive copy of the original output structure intact.
- You can either copy and paste or drag and drop from the original document store (WORK.PRDDOC) to the new document store.

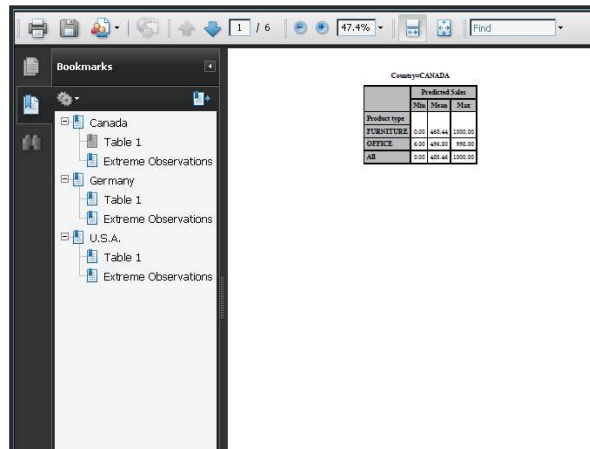


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## Replay New ODS Document

- If you follow the same Open As... steps and replay the document to the PDF destination, the new structure is displayed.

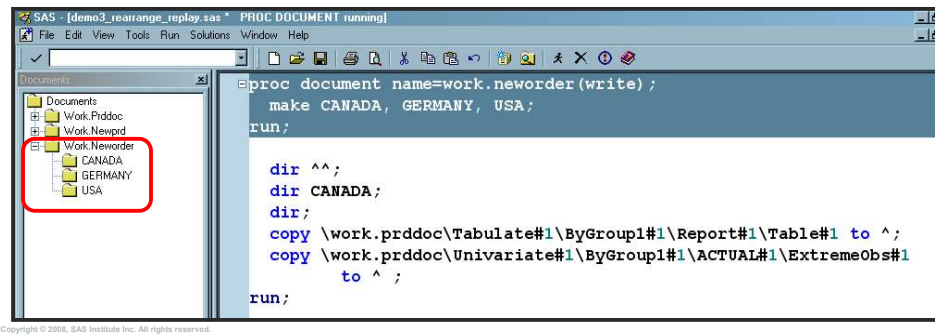


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## Batch Syntax

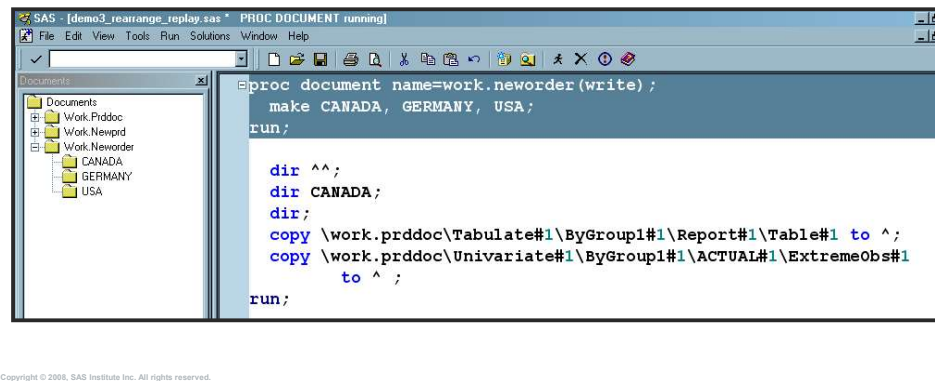
- PROC DOCUMENT provides a batch syntax language to create, manage and replay a document store.
- PROC DOCUMENT is a "run-time" procedure. Use RUN to execute groups of statements and use QUIT to terminate the procedure.



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## The MAKE Statement

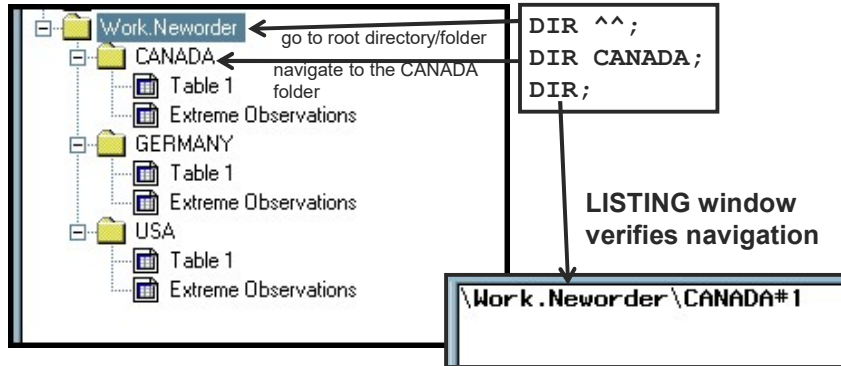
- The MAKE statement creates three directories or folders, one for each country. The highlighted code was submitted and the results are immediately shown in the open Documents window.



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## Navigating the Document Store

- In order to use the batch syntax, you have to navigate the directory structure, using the DIR statement.



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## The COPY Statement

- Use the COPY statement to copy output objects from one document store to a new document store.
- The navigation "shortcut" to ^ means "to the current directory in the document store".

```
copy \work.prddoc\Tabulate#1\ByGroup1#1\Report#1\Table#1 to ^ ;
copy \work.prddoc\Univariate#1\ByGroup1#1\ACTUAL#1\ExtremeObs#1
to ^ ;
```

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## Using Object Names

- Note how the COPY statement uses the object names, as revealed in the LIST output.

```

copy \work.prddoc\Univariate#1\ByGroup1#1\ACTUAL#1\ExtremeObs#1
to ^ ;
run;

dir ^^;
dir GERMANY;
dir;
copy \work.prddoc\Tabulate#1\ByGroup2#1\Report#1\Table#1 to ^ ;
copy \work.prddoc\Univariate#1\ByGroup2#1\ACTUAL#1\ExtremeObs#1
to ^ ;
run;

```

Obs	Path	Type
1	\Tabulate#1	Dir
2	\Tabulate#1\ByGroup1#1	Dir
3	\Tabulate#1\ByGroup1#1\Report#1	Dir
4	\Tabulate#1\ByGroup1#1\Report#1\Table#1	Table
5	\Tabulate#1\ByGroup2#1	Dir
6	\Tabulate#1\ByGroup2#1\Report#1	Dir
7	\Tabulate#1\ByGroup2#1\Report#1\Table#1	Table
8	\Tabulate#1\ByGroup3#1	Dir
9	\Tabulate#1\ByGroup3#1\Report#1	Dir
10	\Tabulate#1\ByGroup3#1\Report#1\Table#1	Table
11	\Univariate#1	Dir
12	\Univariate#1\ByGroup1#1	Dir
13	\Univariate#1\ByGroup1#1\ACTUAL#1	Dir
14	\Univariate#1\ByGroup1#1\ACTUAL#1\ExtremeObs#1	Table
15	\Univariate#1\ByGroup2#1	Dir
16	\Univariate#1\ByGroup2#1\ACTUAL#1	Dir
17	\Univariate#1\ByGroup2#1\ACTUAL#1\ExtremeObs#1	Table
18	\Univariate#1\ByGroup3#1	Dir
19	\Univariate#1\ByGroup3#1\ACTUAL#1	Dir
20	\Univariate#1\ByGroup3#1\ACTUAL#1\ExtremeObs#1	Table

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## Batch Replay Syntax

- The REPLAY statement of PROC DOCUMENT provides the equivalent of the Open As... interactive method of replaying documents. This also allows you to specify ODS options to impact the result file and select a name for the result file.

```

ods html file='replay_new.html'
style=sasweb;
ods pdf file='replay_new.pdf';
proc document name=work.neworder;
replay;
run;
quit;
ods _all_ close;

```

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## Special Subsetting Variables

- WHERE expression processing is possible starting in SAS® 9.2 because ODS DOCUMENT now surfaces a special group of subsetting variables.
- The variables work with the following PROC DOCUMENT statements: COPY TO, MOVE TO, LIST, REPLAY, and DELETE.

Subsetting Variable	Meaning
_CDATE_	creation date of the current entry
_LABEL_	label of the current entry
_LABELPATH_	path to the label of the current entry
_MDATE_	modification date of the current entry
_NAME_	name of the current entry
_PATH_	path of the current entry
_TYPE_	type of the current entry (Table or Graph)
Variable-name	name of a BY variable

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## Replaying Selected Output Objects

- PROC DOCUMENT supports WHERE processing for selecting output objects for replay.

```

** Replay Using a WHERE expression;
ods pdf file='c:\temp\replay_where.pdf';
proc document name=work.neworder;
  replay ^(where=( _path_ contains 'Table#1')) ;
run;
quit;
ods _all_ close;

** Replay a directory by directory name;
ods pdf file='c:\temp\replay_dir.pdf';
proc document name=work.neworder;
  replay \CANADA#1 / levels=all;
run;
quit;
ods _all_ close;

```

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## Replaying Selected Output Objects

- PROC DOCUMENT supports WHERE processing based on using a BY variable name.

```

** Replay Using a BY variable name;
ods html file='c:\temp\replay_var.html'
      style=sasweb;
ods pdf file='c:\temp\replay_var.pdf';
proc document name=work.neworder;
  replay ^(where=(Country = 'GERMANY')) ;
run;
quit;
ods _all_ close;
  
```

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## Replaying to Multiple Destinations

- Different output objects can be replayed to different destinations.

```

** Replay to Multiple Destinations;
ods html file='c:\temp\replay_dest.html'
      style=sasweb;
ods pdf file='c:\temp\replay_dest.pdf';
ods rtf file='c:\temp\replay_dest.rtf'
      style=journal startpage=no;
proc document name=work.neworder;
  replay \USA#1 / levels=all dest=(html pdf);
run;

  replay ^(where=( _path_ contains 'Table#1'))
    / dest=rtf ;
run;
quit;
ods _all_ close;
  
```

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## Results to Multiple Destinations

Country=CANADA

Product type	Predicted Sales		
	Min	Mean	Max
FURNITURE	0.00	495.44	1000.00
OFFICE	0.00	495.90	999.00
All	0.00	495.46	1000.00

Country=GERMANY

Product type	Predicted Sales		
	Min	Mean	Max
FURNITURE	0.00	495.01	993.00
OFFICE	10.00	492.40	992.00
All	0.00	492.40	993.00

Country=U.S.A.

Product type	Predicted Sales		
	Min	Mean	Max
FURNITURE	1.00	495.13	1000.00
OFFICE	19.00	509.23	999.00
All	1.00	503.59	1000.00

Country=U.S.A.

Product type	Predicted Sales		
	Min	Mean	Max
FURNITURE	1.00	495.13	1000.00
OFFICE	19.00	509.23	999.00
All	1.00	503.59	1000.00

The UNIVARIATE Procedure  
Variable: ACTUAL (Actual Sales)

Country=U.S.A.

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
4	961	974	1366
6	1300	977	1179

RTF Output shown in Word Print Preview Mode

HTML Output shown in Internet Explorer

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## Tasks That Cannot Be Performed Interactively

- There are some actions that can only be accomplished with PROC DOCUMENT syntax. These tasks generally enhance the document and cannot be performed interactively.

Tasks That You Can Only Perform with PROC DOCUMENT	Documents Window	Document Procedure
Import a data set or graph segment.	No	Yes
Set or display the current directory.	No	Yes
Create or delete a page break.	No	Yes
Create or modify title lines.	No	Yes
Create or modify subtitles.	No	Yes
Create or modify the lines of text before output objects.	No	Yes
Create or modify the lines of text after output objects.	No	Yes
Create or modify footnote lines.	No	Yes
Create text strings in the current folder.	No	Yes

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## Tasks Possible with Both Methods

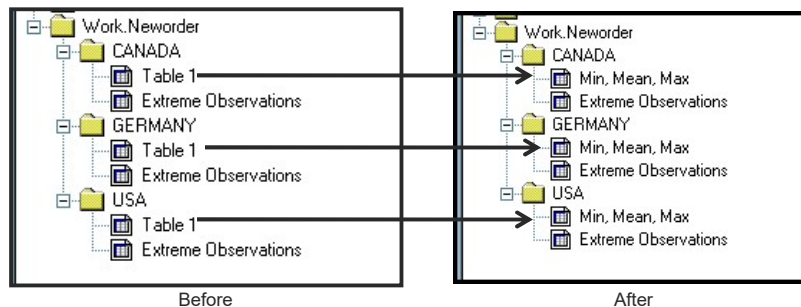
Tasks That You Can Perform with Both Methods	Documents Window	Document Procedure
Create a new ODS document.	Yes	Yes
Create a new folder.	Yes	Yes
Copy folders or output objects.	Yes	Yes
Move folders or output objects.	Yes	Yes
Create a symbolic link from one output object to another output object.	Yes	Yes
Delete a document, folder, or output object.	Yes	Yes
Rename a folder or output object.	Yes	Yes
Assign a description to a folder or output object.	Yes	Yes
Prevent entries from being displayed when they are replayed.	Yes	Yes
Show entries that are excluded.	Yes	Yes
Enable hidden entries to be displayed.	Yes	Yes
Replay to the specified open ODS destinations.	Yes	Yes
Determine the path specification.	Yes	Yes

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## Desired Enhancements

- Create one page for each country's output by removing the page break between output objects.
- Insert some text specific to each country.
- Create labels for the folders.



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## OB Statements

- The "OB" statements alter notes, page breaks, titles and footnotes in the ODS document.
- OBPAGE statement allows page breaks to be inserted or deleted.
- OBBNOTE allows the insertion of notes before an output object, while the OBANOTE statement allows the insertion of notes after an output object.
- Other "OB" statements include: OBTITLE, OBFOOTN, OBPAGE, OBSTITLE. Refer to the ODS Document documentation for more information on the use of these statements.

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## Enhancement Code

- In addition to deleting page breaks and the titles associated with them, different text strings are specified for each country.

```
proc document name=work.neworder(update) ;
  dir ^^;
  obpage \CANADA#1\ExtremeObs#1 /delete;
  obbnote \CANADA#1\Table#1 'Something' /just=center;
  obbnote \CANADA#1\ExtremeObs#1 'Text1' / just=center;
  obpage \GERMANY#1\ExtremeObs#1 / delete;
  obbnote \GERMANY#1\Table#1 'Something Else' /just=center;
  obbnote \GERMANY#1\ExtremeObs#1 'Text2' / just=center;
  obpage \USA#1\ExtremeObs#1 /delete;
  obbnote \USA#1\Table#1 'Another Thing' /just=center;
  obbnote \USA#1\ExtremeObs#1 'Text3' / just=center;
  setlabel \CANADA#1\Table#1 'Min, Mean, Max';
  setlabel \GERMANY#1\Table#1 'Min, Mean, Max';
  setlabel \USA#1\Table#1 'Min, Mean, Max';
run;
quit;
```

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## Enhancement Results

```
obbnote \CANADA#1\Table#1 'Something' /just=center;
obbnote \CANADA#1\ExtremeObs#1 'Text1' / just=center;
```

Country=CANADA

**Something**

Product type	Predicted Sales		
	Min	Mean	Max
FURNITURE	0.00	460.44	1000.00
OFFICE	6.00	496.80	990.00
All	0.00	483.46	1000.00

Text1

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
3	377	990	74
5	121	990	100
6	206	997	230
8	127	999	2
9	209	1000	455

Country=GERMANY

**Something Else**

Product type	Predicted Sales		
	Min	Mean	Max
FURNITURE	0.00	406.01	993.00
OFFICE	10.00	400.00	992.00
All	0.00	402.40	993.00

Text2

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
3	747	994	652
13	606	996	481
14	710	996	504
15	626	996	563
22	835	1000	663

```
obbnote \GERMANY#1\Table#1 'Something Else' /just=center;
obbnote \GERMANY#1\ExtremeObs#1 'Text2' / just=center;
```

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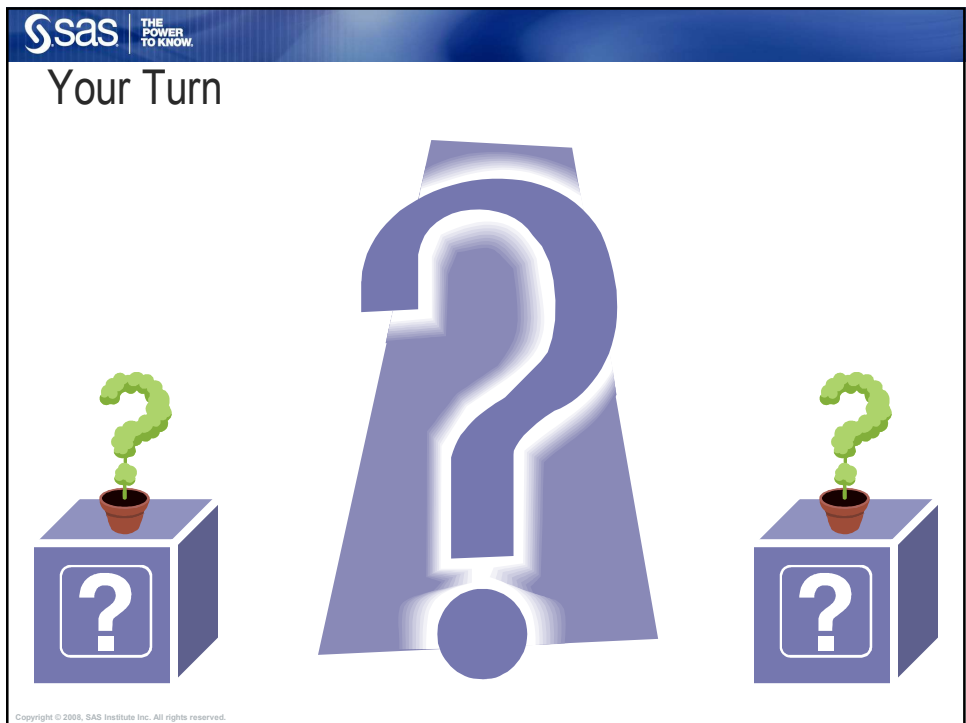
May the  
ODS Document  
Force  
Be With You!

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## About the Speaker

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