

ODS Advanced Presentation



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Default HTML Output

Some programming goals require procedural output to be displayed in an Internet browser.

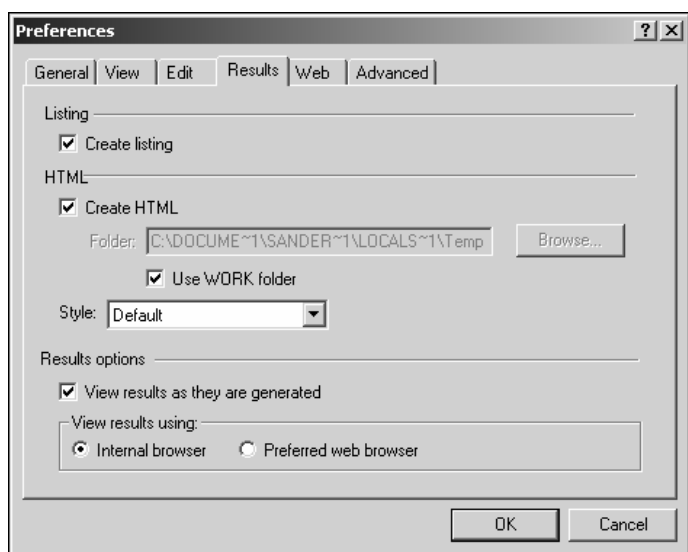
The hypertext markup language (HTML) output required can be created in two ways.

One method of creating HTML output is to use the pull-down menus:

Tools → Options → Preferences

This opens the Preferences window.

Select the Results tab.



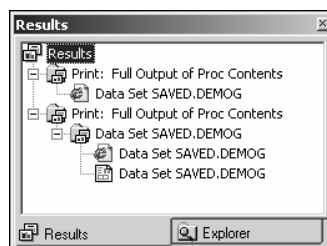
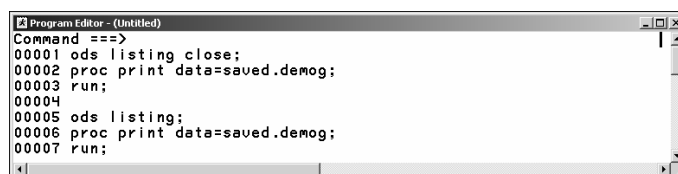
Selecting the 'Create HTML' check box formats procedural output as HTML and displays it in the Results Viewer window in the Display Manager environment.



Note that the Results window references output sent to the Results Viewer tab.

Note the difference between the Listing window and the Results Viewer icons.

Submit the following code.



Other aspects of the Results tab require attention.

1. The output can be channeled as needed, often to the Work library.
 - a. If this destination is preferred, select the 'Use WORK folder' check box
 - b. If the Work library is not preferred, deselect the 'Use WORK folder'. This enables the 'Browse' button or the text area to indicate where the output should be placed.
2. Styles of HTML output are provided by SAS.
 - a. To select the preferred style, click on the arrow to show styles, then click on the style name
 - b. Styles include: Barretts Blue, Beige, Brick, Brown, D3D, Default, Fancy Printer, Minimal, NoFont Default, Printer, Rtf, SansPrinter, SerifPrinter, and Statdoc
 - c. Not all styles apply to HTML output. In general, any style referencing a printer does not. Experiment when necessary.
3. Results can be viewed
 - a. Results may be viewed as they are created
 - b. Results may be viewed by the internal browser in the Results Viewer or by a preferred web browser

Enhancing ODS HTML Output

We can enhance ODS HTML output using the ODS HTML File = option.

```
Program Editor - (Untitled)
Command ==>
00001 ods html file="a:\myoutput.html";
00002   proc print data=saved.demog (obs=3);
00003     var name age salary children;
00004   run;
00005 ods html close;
```

```
Log - (Untitled)
751 ods listing close;
752 ods html file="a:\myoutput.html";
753   contents="a:\mycontents.html";
NOTE: Writing HTML Body file: a:\myoutput.html
NOTE: Writing HTML Contents file: a:\mycontents.html
754   proc print data=saved.demog;
755   run;
NOTE: There were 50 observations read from the data set SAVED.DEMOG.
NOTE: PROCEDURE PRINT used:
      real time    4.06 seconds
      cpu time      0.02 seconds

756   proc contents data=saved.demog;
757   run;
NOTE: PROCEDURE CONTENTS used:
      real time    2.30 seconds
      cpu time      0.03 seconds

758   proc univariate data=saved.demog;
759   run;
NOTE: There were 50 observations read from the data set SAVED.DEMOG.
NOTE: PROCEDURE UNIVARIATE used:
      real time    6.77 seconds
      cpu time      0.15 seconds

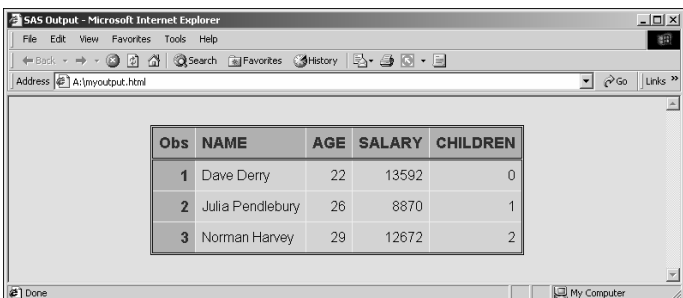
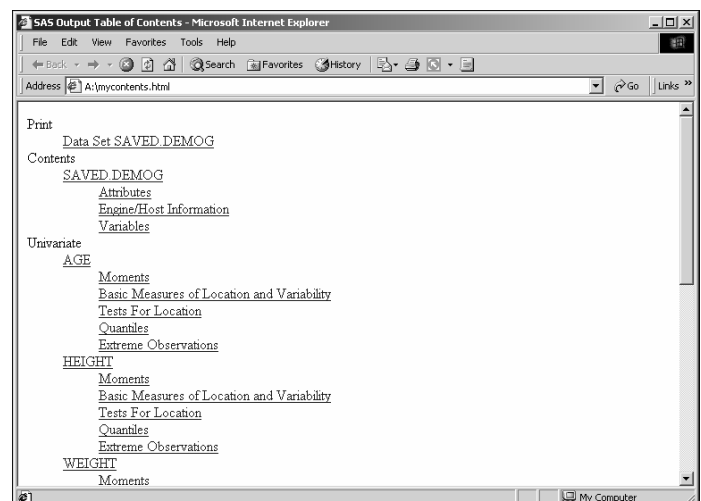
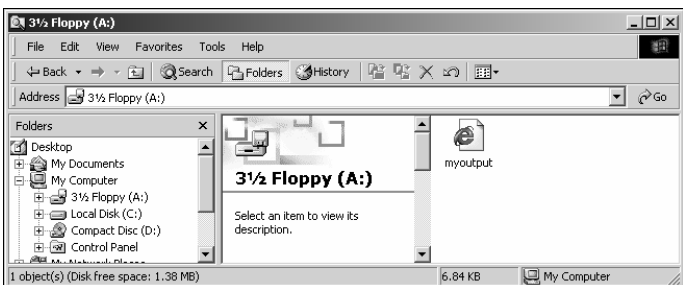
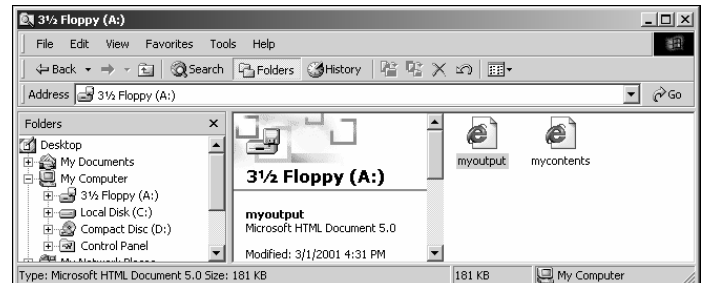
760 ods html close;
761 ods listing;
```

Aspects of this syntax include the following:

- The file extension must be either 'html' or 'htm'
- The file= syntax can also use body=
- Multiple procedures can be included

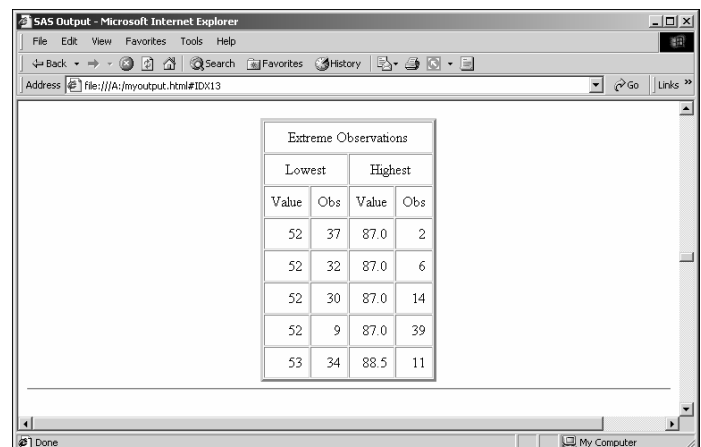
```
Log - (Untitled)
718 ods html file="a:\myoutput.html";
NOTE: Writing HTML Body file: a:\myoutput.html
719   proc print data=saved.demog (obs=3);
720     var name age salary children;
721   run;
NOTE: There were 3 observations read from the data set SAVED.DEMOG.
NOTE: PROCEDURE PRINT used:
      real time    1.02 seconds
      cpu time      0.01 seconds

722 ods html close;
```



Enhancing ODS HTML Output / File=, Contents=

```
Program Editor - (Untitled)
Command ==>
00001 ods listing close;
00002 ods html file="a:\myoutput.html"
00003   contents="a:\mycontents.html";
00004   proc print data=saved.demog;
00005   run;
00006   proc contents data=saved.demog;
00007   run;
00008   proc univariate data=saved.demog;
00009   run;
00010 ods html close;
00011 ods listing;
```



Enhancing ODS HTML Output / File=, Page=

```

Program Editor - (Untitled)
Command ==>

00001 ods listing close;
00002 ods html file="a:\myoutput.html"
00003       page="a:\mypages.html";
00004 proc print data=saved.demog;
00005 run;
00006 proc contents data=saved.demog;
00007 run;
00008 proc univariate data=saved.demog;
00009 run;
00010 ods html close;
00011 ods listing;
00012

```

```

Log - (Untitled)

773 ods listing close;
774 ods html file="a:\myoutput.html"
775       page="a:\mypages.html";
NOTE: Writing HTML Body file: a:\myoutput.html
NOTE: Writing HTML Pages file: a:\mypages.html
776 proc print data=saved.demog;
777 run;

NOTE: There were 50 observations read from the data set SAVED.DEMOG.
NOTE: PROCEDURE PRINT used:
      real time    2.58 seconds
      cpu time      0.03 seconds

778 proc contents data=saved.demog;
779 run;

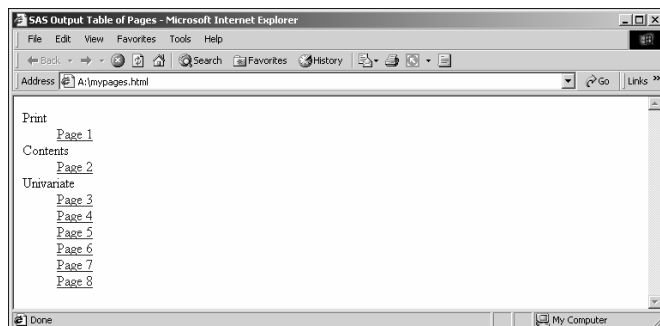
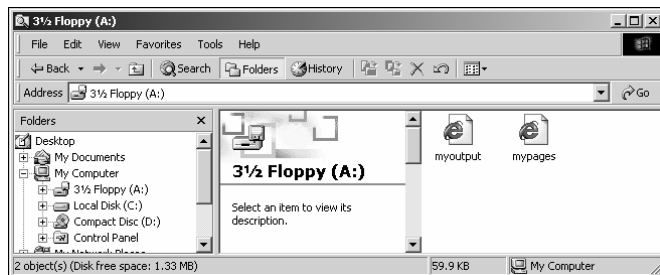
NOTE: PROCEDURE CONTENTS used:
      real time    1.94 seconds
      cpu time      0.02 seconds

780 proc univariate data=saved.demog;
781 run;

NOTE: Unable to find the "Note" style element. Default style attributes will be used.
NOTE: There were 50 observations read from the data set SAVED.DEMOG.
NOTE: PROCEDURE UNIVARIATE used:
      real time    3.96 seconds
      cpu time      0.15 seconds

782 ods html close;
783 ods listing;

```



The UNIVARIATE Procedure
Variable: HEIGHT

Moments			
N	50	Sum Weights	50
Mean	68.7	Sum Observations	3435
Std Deviation	11.5188399	Variance	132.683673
Skewness	0.26259022	Kurtosis	-1.0882207
Uncorrected SS	242486	Corrected SS	6501.5
Coeff Variation	16.7668704	Std Error Mean	1.62900997

Enhancing ODS HTML Output / File=, Contents=, Frame=

```

Program Editor - (Untitled)
Command ==>

00001 ods listing close;
00002 ods html file="a:\myoutput.html"
00003       contents="a:\mycontents.html"
00004       frame="a:\myframes.html";
00005 proc print data=saved.demog;
00006 run;
00007 proc contents data=saved.demog;
00008 run;
00009 proc univariate data=saved.demog;
00010 run;
00011 ods html close;
00012 ods listing;
00013

```

```

Log - (Untitled)

842 ods listing close;
843 ods html file="a:\myoutput.html"
844       contents="a:\mycontents.html"
845       frame="a:\myframes.html";
NOTE: Writing HTML Body file: a:\myoutput.html
NOTE: Writing HTML Contents file: a:\mycontents.html
NOTE: Writing HTML Frames file: a:\myframes.html
846 proc print data=saved.demog;
847 run;

NOTE: There were 50 observations read from the data set SAVED.DEMOG.
NOTE: PROCEDURE PRINT used:
      real time    2.47 seconds
      cpu time      0.02 seconds

848 proc contents data=saved.demog;
849 run;

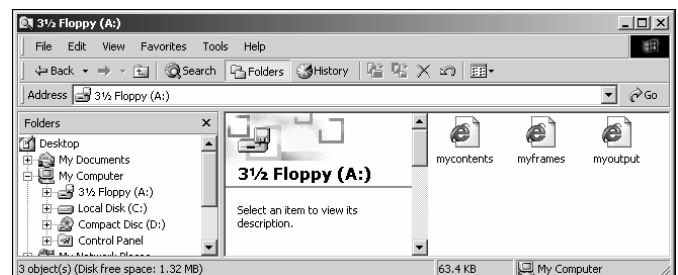
NOTE: PROCEDURE CONTENTS used:
      real time    1.33 seconds
      cpu time      0.02 seconds

850 proc univariate data=saved.demog;
851 run;

NOTE: Unable to find the "Note" style element. Default style attributes will be used.
NOTE: There were 50 observations read from the data set SAVED.DEMOG.
NOTE: PROCEDURE UNIVARIATE used:
      real time    8.77 seconds
      cpu time      0.15 seconds

852 ods html close;
853 ods listing;

```



```

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">

<HTML>
<!-- Generated by SAS Software -->
<!-- Http://www.sas.com -->
<HEAD>
<META http-equiv="Content-type" content="text/html">
<TITLE>SAS Output Frame</TITLE>
</HEAD>
<FRAMESET FRAMEBORDER=auto FRAMESPACING=3 COLS="23%,*"
<FRAME MARGINWIDTH="4" MARGINHEIGHT="0" SRC="a:\mycontents.html"
      NAME="contents" SCROLLING=auto>
<FRAME MARGINWIDTH="9" MARGINHEIGHT="0" SRC="a:\myoutput.html"
      NAME="body" SCROLLING=auto>
</FRAMESET>
</HTML>

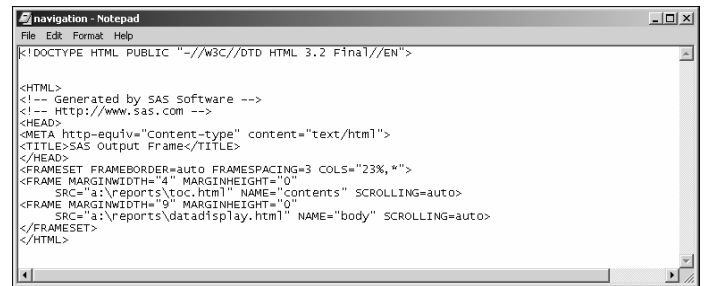
```

The screenshot shows the SAS Output Frame window with a table of data. The table has columns: Obs, NAME, AGE, GENDER, HEIGHT, WEIGHT, STATUS, CHILDREN, CARS, and SA. The data is as follows:

Obs	NAME	AGE	GENDER	HEIGHT	WEIGHT	STATUS	CHILDREN	CARS	SA
1	Dave Derry	22	M	64.0	60	S	0	1	
2	Julia Pendlebury	26	F	87.0	74	M	1	1	
3	Norman Harvey	29	M	55.0	62	D	2	1	
4	Harold Hicks	28	M	84.0	74	M	3	1	
5	Mary Molesworth	23	F	84.0	88	F	1	1	
6	Bob Bobington	30	M	87.0	76	S	0	1	
7	Freda Bamford	34	F	78.0	72	M	2	1	



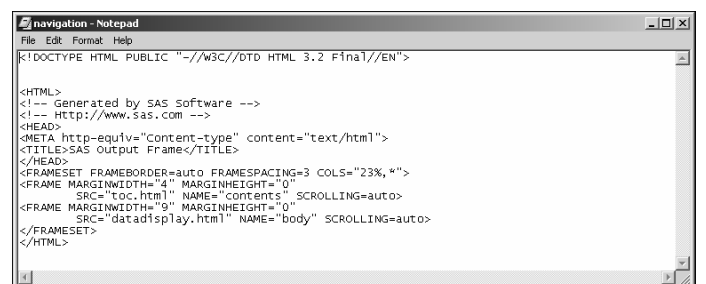
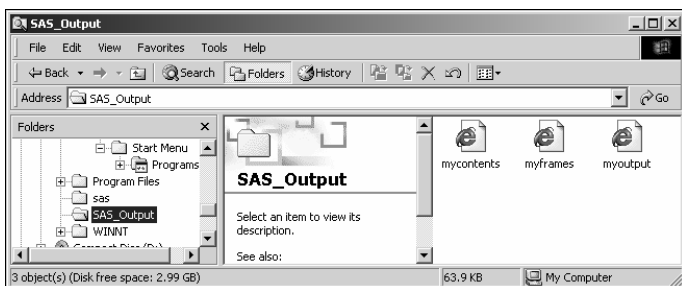
Notice the SRC= syntax which provides path information referencing the drive and subfolders containing the file.



Consider using the PATH= and URL=NONE explicitly stated in the syntax.

In this syntax, the hyperlinks lack information on the drive and folder. Only the file is referenced. It implies that the file must be in the same disk location as the frames file.

Enhancing ODS HTML Output / File=, Contents=, Frame=, Path=

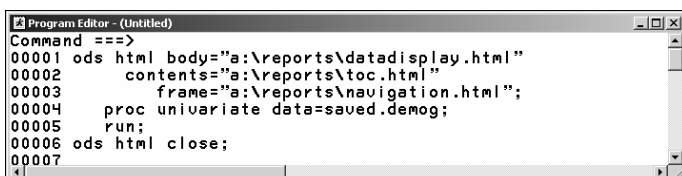


Creating Hyperlinks – Path, Base and URL syntax

The issue of what hyperlink paths are created in the Frames file is important.

Correct use of the URL=, Path= and Base= options assure desired results.

The first syntax to consider is omitting the URL reference entirely.

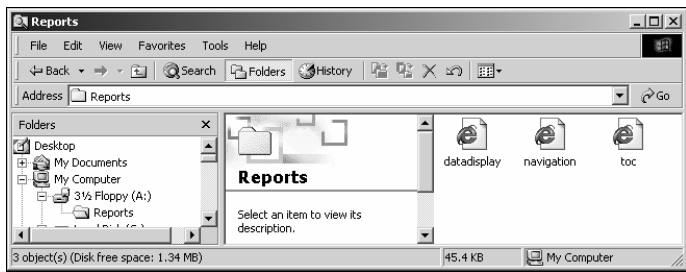


File location can be seen when supplying the Path=, URL=NONE, and Base= information.

```

Command ==>
00001 ods html path="a:\reports" (url=none)
00002 base="http://www.destinycorp.com/data/"
00003 body="datadisplay.html"
00004 contents="toc.html"
00005 frame="navigation.html";
00006 proc univariate data=saved.demog;
00007 run;
00008 ods html close;
00009

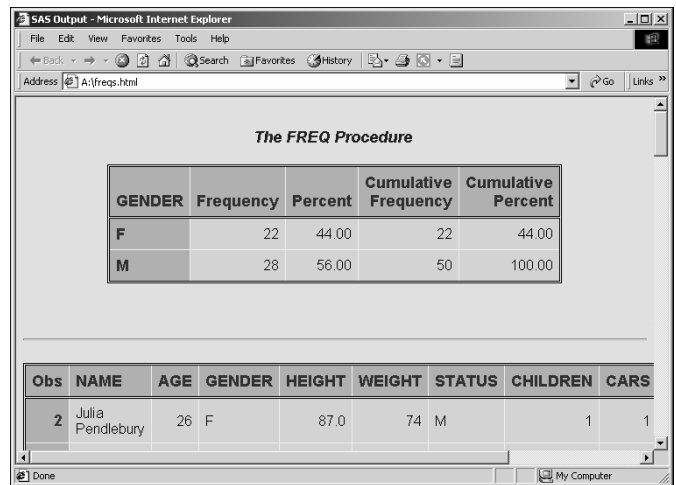
```



```

navigation - Notepad
File Edit Format Help
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<!-- Generated by SAS Software -->
<!-- Http://www.sas.com -->
<HEAD>
<META http-equiv="Content-type" content="text/html">
<TITLE>SAS output Frame</TITLE>
</HEAD>
<FRAMESET FRAMEBORDER=auto FRAMESPACING=3 COLS="23%,*">
<FRAME MARGINWIDTH="4" MARGINHEIGHT="0"
SRC="http://www.destinycorp.com/data/toc.html" NAME="contents" SCROLLING=auto>
<FRAME MARGINWIDTH="9" MARGINHEIGHT="0"
SRC="http://www.destinycorp.com/data/datadisplay.html" NAME="body" SCROLLING=auto>
</FRAMESET>
</HTML>

```



The syntax can be adjusted to show hyperlinks. Title and footnote statements have been used.

```

Command ==>
00001 ods html file="a:\freqs.html" style=default;
00002
00003 title '<a href="home.html">
00004 Return to Homepage</a>';
00005 proc freq data=saved.demog;
00006 table gender;
00007 run;
00008 title;
00009 proc print data=saved.demog (where=(gender="F"));
00010 run;
00011 proc print data=saved.demog (where=(gender="M"));
00012 run;
00013 ods html close;
00014

```

Titles and Footnotes in HTML Output / Report Styles

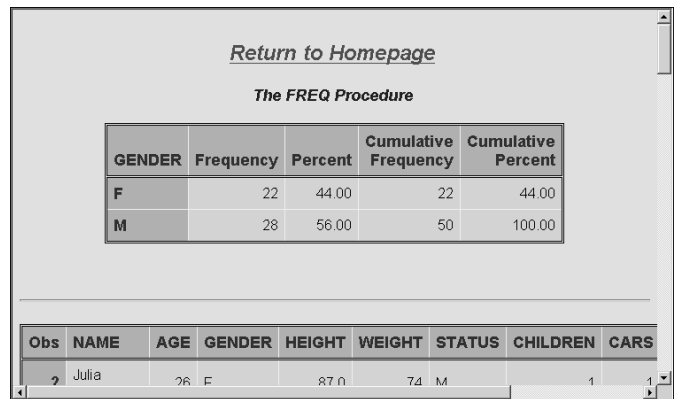
Titles and footnotes have always been available for procedural output. With ODS HTML output, titles and footnotes can take on the new role of hyperlinks.

Examine the following output. It might be helpful to have navigation at the top and/or bottom of the browser page.

```

Command ==>
00001 ods html file="a:\freqs.html" style=default;
00002 proc freq data=saved.demog;
00003 table gender;
00004 run;
00005 proc print data=saved.demog (where=(gender="F"));
00006 run;
00007 proc print data=saved.demog (where=(gender="M"));
00008 run;
00009 ods html close;
00010

```



Additional HTML syntax can help us achieve programming objectives.

```

Command ==>
00001 ods html file="a:\freqs.html" style=default;
00002 title '<font size="-1"><i><a href="home.html">
00003 Return to Homepage</a></i></font>';
00004 proc freq data=saved.demog;
00005 table gender;
00006 run;
00007 title;
00008 proc print data=saved.demog (where=(gender="F"));
00009 run;
00010 proc print data=saved.demog (where=(gender="M"));
00011 run;
00012 ods html close;
00013

```

Return to Homepage

The FREQ Procedure

GENDER	Frequency	Percent	Cumulative Frequency	Cumulative Percent
F	22	44.00	22	44.00
M	28	56.00	50	100.00

A variation on the Title and Footnote statement syntax for use in ODS HTML output is reminiscent of SAS/GRAPH syntax.

Instead of relying on HTML syntax, SAS can use string formatting in a more direct manner.

```

Command ==>
00001 ods html file="a:\freqs.html" style=minimal;
00002
00003 title j=center color="red"
00004 bold
00005 "Frequency Data on Gender";
00006 title2 j=right color="red"
00007 italic font=courier
00008 "Saved.Demog Data Set";
00009 footnote link="home.html" "Return to Home Page";
00010 proc freq data=saved.demog;
00011 table gender;
00012 run;
00013 title;
00014 ods html close;
00015

```

Frequency Data on Gender

Saved.Demog Data Set

The FREQ Procedure

GENDER	Frequency	Percent	Cumulative Frequency	Cumulative Percent
F	22	44.00	22	44.00
M	28	56.00	50	100.00

Return to Home Page

As seen in several examples, the ODS HTML statement can reference a report style.

These were displayed in the earlier portion of the course.

ODS HTML <...> NEWFILE =

By default, all output is put into a single Body file.

This can be expressed in syntax with the NEWFILE=NONE option.

In contrast, multiple documents can be created, each holding separate procedural output. If the Body file ends in a number, procedural output is put into separate files, each numbered from the original starting point.

A new file of output can also be created with each page of output (NEWFILE=PAGE) or each Proc output (NEWFILE=PROC). A separate file can also be created for each piece of output (NEWFILE=OUTPUT).

```

Command ==>
00001 ods html body="myoutput.html"
00002 contents="mycontents.html"
00003 page="mypage.html"
00004 frame="myframe.html"
00005 path="a:\Reports";
00006 proc print data=saved.demog;
00007 run;
00008 proc contents data=saved.demog;
00009 run;
00010 proc univariate data=saved.demog;
00011 run;
00012 ods html close;
00013
00014

```



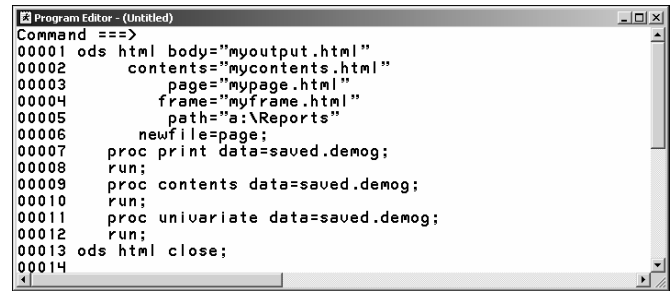
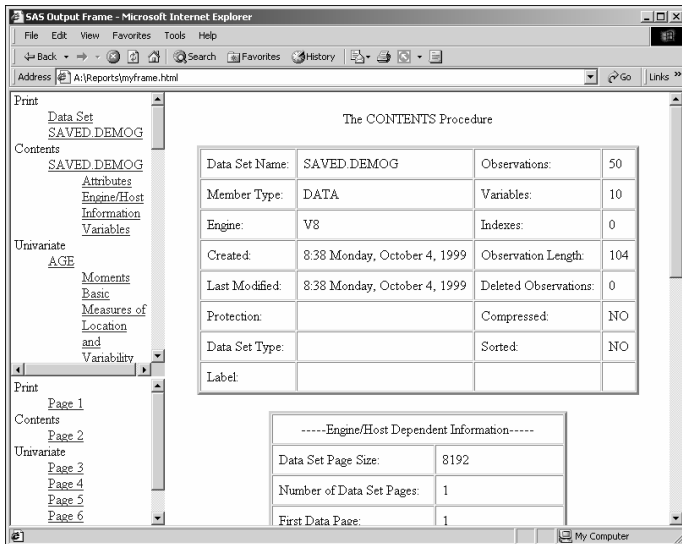
Create separate files for each procedural output.

```

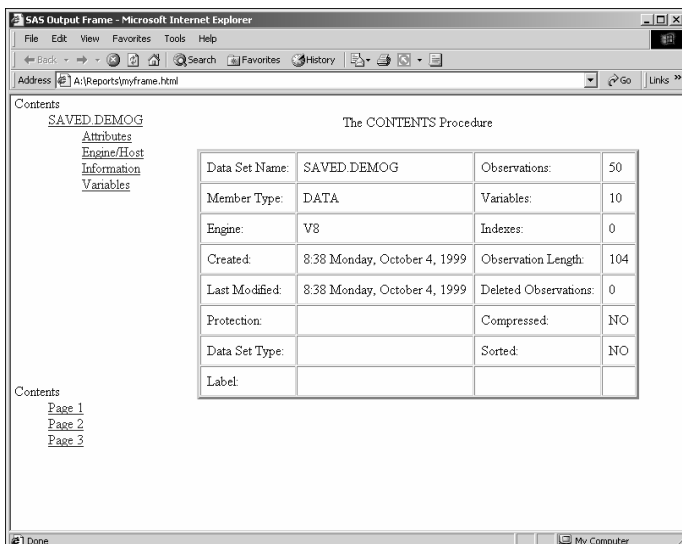
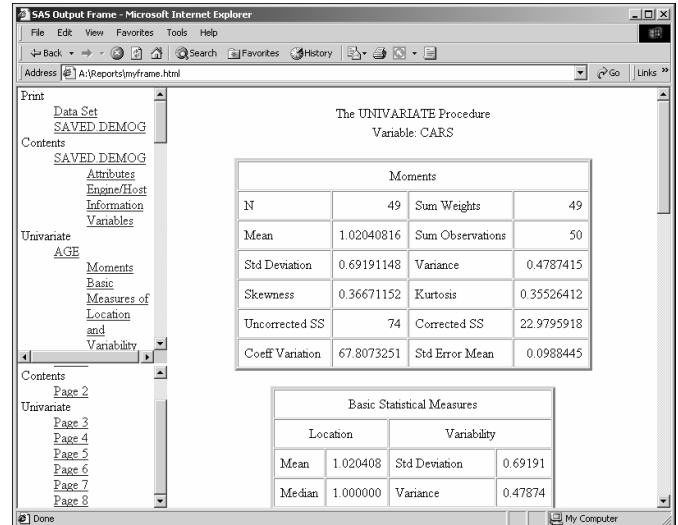
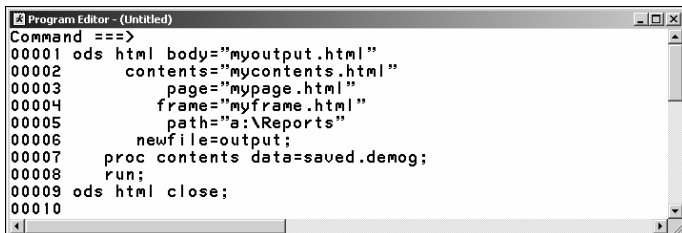
Command ==>
00001 ods html body="myoutput.html"
00002 contents="mycontents.html"
00003 page="mypage.html"
00004 frame="myframe.html"
00005 path="a:\Reports"
00006 newfile=proc;
00007 proc print data=saved.demog;
00008 run;
00009 proc contents data=saved.demog;
00010 run;
00011 proc univariate data=saved.demog;
00012 run;
00013 ods html close;
00014

```



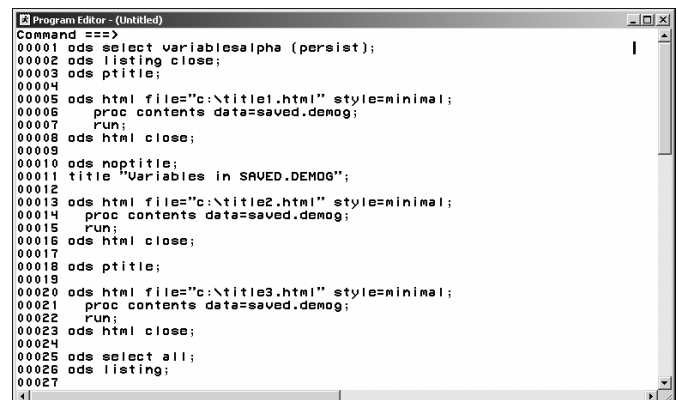


Create separate files for each table template of the document.

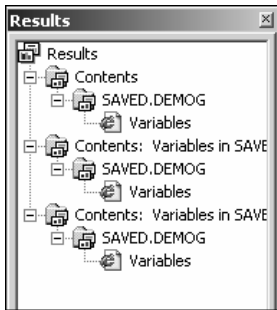


ODS NOPTITLE

To remove the title of the Procedure, use ODS Noprttitle.



Create a new file for each page output of the procedure.



Results Viewer - title1

The CONTENTS Procedure

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos
2	AGE	Num	8	0
8	CARS	Num	8	32
7	CHILDREN	Num	8	24

Results Viewer - title2

Variables in SAVED.DEMOG

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos
2	AGE	Num	8	0
8	CARS	Num	8	32
7	CHILDREN	Num	8	24

Results Viewer - SAS Output

Variables in SAVED.DEMOG

The CONTENTS Procedure

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos
2	AGE	Num	8	0
8	CARS	Num	8	32

Workshop

Exercise 1

Create a single file of output using multiple procs to display data.

Use the procs you are likely to use to meet your Web publishing goals.

Script an ODS statement to create a frame document calling in 'contents' and 'file' outputs.

Exercise 2

Modify your output (from Exercise 1) by using the Newfile option values.

Consider the advantages and disadvantages of each Newfile value for use in your publishing goals.

Exercise 3

Enhance your output by adding titles. Try adding titles pointing to the top and bottom of the current file.

Provide navigation options. Be creative.

Workshop Solutions

Exercise 1

```

Program Editor - (Untitled)
Command ==>
00001 ods html file = "a:\reports\output.html"
00002 contents = "a:\reports\toc.html"
00003 | frame = "a:\reports\data.html";
00004
00005 proc freq data=saved.demog;
00006 run;
00007
00008 proc means data=saved.demog;
00009 run;
00010
00011 proc sql;
00012 select status,
00013        avg(salary) as Avg_Income,
00014        avg(cars) as Avg_Cars
00015 from saved.demog
00016 where salary gt 0
00017 group by status;
00018 quit;
00019
00020 ods html close;
00021
00022

```

SAS Output Frame - Microsoft Internet Explorer

Address A:\reports\data.html

Table of Contents

1. The Freq Procedure

Table NAME

One-Way Frequencies

NAME	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Alan Postlethwaite	1	2.00	1	2.00
Albert Morris	1	2.00	2	4.00
Andrew Fortesque-Smyth	1	2.00	3	6.00
Anna Kinsella	1	2.00	4	8.00

Exercise 2

```

Program Editor - (Untitled)
Command ==>
00001 ods html file = "a:\reports\output.html"
00002 contents = "a:\reports\toc.html"
00003 frame = "a:\reports\data.html"
00004 newfile = proc;
00005
00006 proc freq data=saved.demog;
00007 run;
00008
00009 proc means data=saved.demog;
00010 run;
00011
00012 proc sql;
00013 select status,
00014        avg(salary) as Avg_Income,
00015        avg(cars) as Avg_Cars
00016 from saved.demog
00017 where salary gt 0
00018 group by status;
00019 quit;
00020
00021 ods html close;
00022
00023

```

SAS Output Frame - Microsoft Internet Explorer

Address A:\reports\data.html

One-Way Frequencies

2. The Means Procedure

Summary statistics

STATUS	Avg_Income	Avg_Cars
	11008	0
D	21976.4	1
M	20614	1.269231
P	14260	0.75
S	18658.5	0.6
W	29020	1

Exercise 3

```
Program Editor - (Untitled)
Command ==>
00001 ods noprint;
00002 title; footnote;
00003 ods html file = "a:\reports\output.html"
00004 contents = "a:\reports\toc.html"
00005 frame = "a:\reports\data.html"
00006 newfile = proc;
00007
00008 title j=center color = blue
00009 bold
00010 "Statistical Analysis of Demog";
00011 title2 j=right color = green
00012 "Proc Frequency Output";
00013 footnote1 j=left
00014 <a href="home.html">Return to Home</a>;
00015 footnote2 j=left
00016 <a href=#top>go to top</a>;
00017
00018 proc freq data=saved.demog;
00019 run;
00020
00021 title2 j=right color = green
00022 "Proc Means Output";
00023 proc means data=saved.demog;
00024 run;
00025
00026 title2 j=right color = green
00027 "Proc SQL Output";
00028 proc sql;
00029 select status,
00030 avg(salary) as Avg_Income,
00031 avg(cars) as Avg_Cars
00032 from saved.demog
00033 where salary > 0
00034 group by status;
00035 quit;
00036
00037 ods html close;
00038 ods ptitle;
00039 title; footnote;
00040
```

ODS with Graphics

SAS can create graphic output (with the SAS/GRAPH license) directly to the Web.

This process uses Web drivers:

- GIF
- ACTIVE X
- JAVA
- WEBFRAME
- GIFANIM
- JAVAMET (v. 8.1)

The SAS/GRAPH procedures that can be used with Gif, Active X and Java include:

- GANNO (Gif)
- GCHART (Gif, Active X, Java)
- GCONTOUR (Gif, Active X, Java)
- GFONT (Gif)
- GIMPORT (Gif)
- GMAP (Gif, Active X, Java)
- GPLOT (Gif, Active X, Java)
- GPRINT (Gif)
- GREPLAY (Gif)
- GTESTIT (Gif)
- GSLIDE (Gif)
- G3D (Gif, Active X, Java)
- G3GRID (Gif)

Not all graph options can be applied to each output destination. Check your documentation for specifics and version updates.

Active X

Version 8 onwards, SAS/GRAPH can create Active X graphs for viewing in Web browser mode.

Once the graph is created, it can be customized without having to re-run it.

For example, a vertical bar chart can be changed into a horizontal bar chart or a pie chart. Features such as type, color and axes can be modified.

Many features of SAS/GRAPH procedures are not supported. These include:

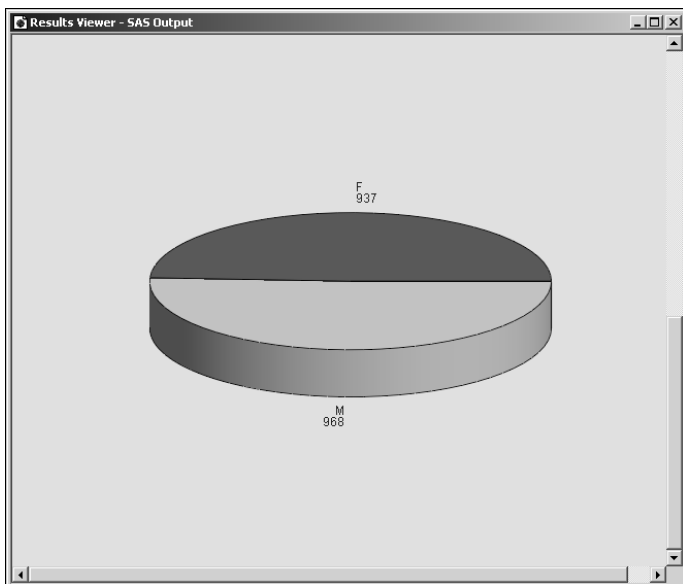
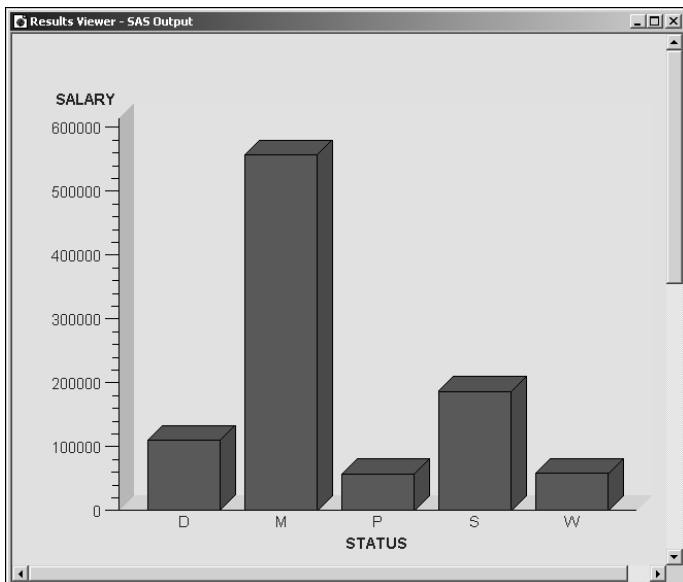
- User-defined formats
- Fonts (other than certain PC TrueType fonts)

Active X does not support the following procedures:

- GTESTIT
- GSLIDE
- GREPLAY
- GANNO
- GRPINT

It will produce GIF output.

```
Program Editor - (Untitled)
Command ==>
00001 goptions reset=global
00002 reset=all
00003 device = activex transparency;
00004
00005 ods html file="c:\mygif.html";
00006 proc gchart data=saved.demog;
00007 vbar3d status / sumvar = salary;
00008 run;
00009 pie3d gender / sumvar = age;
00010 run;
00011 quit;
00012 ods html close;
00013
```



Java

SAS/GRAPH can also create Java output.

There are some limitations.

The following graph procedures do not produce Java output:

- PROC GANNO
- PROC GPRINT
- PROC GREPLAY
- PROC GSLIDE
- PROC GTESTIT

Java output does not support the following:

- Fonts (other than SansSerif – equivalent to Helvetica)
- Some SAS formats (see list below)

- User-defined formats (now available in V. 8.1)

The following SAS-defined formats are not currently supported with Java output.

Character Formats			
\$KANJlw	\$BYVALw	\$CSTRw	\$EDCDICw
\$REVERJw	\$KANJIXw	\$MSGCASEw	\$QUOTEw
Date Formats	\$REVERSw	\$UPERCASEw	\$VERYINGw
DTYYQCw	DTDATEw	DTMONYYw	DTYEARw
NENGOW	HHMMw.d	HOURw.d	MMSSw.d
YYQZ	TIMEw.d	TIMEAMP Mw.d	XYMMDD

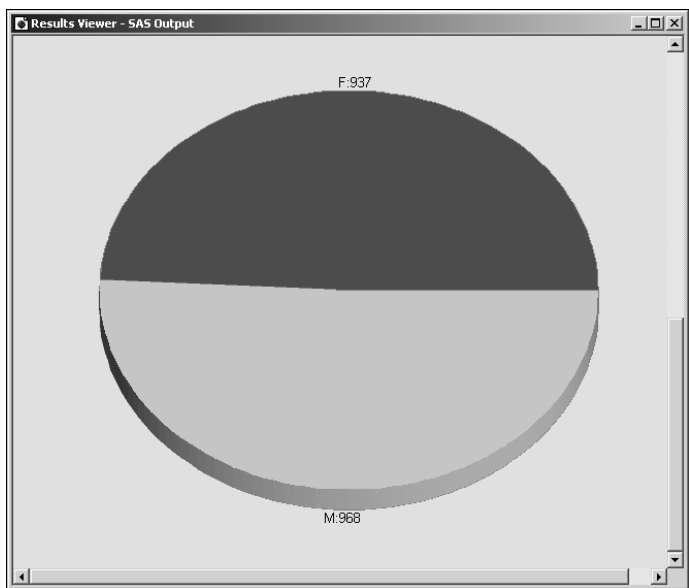
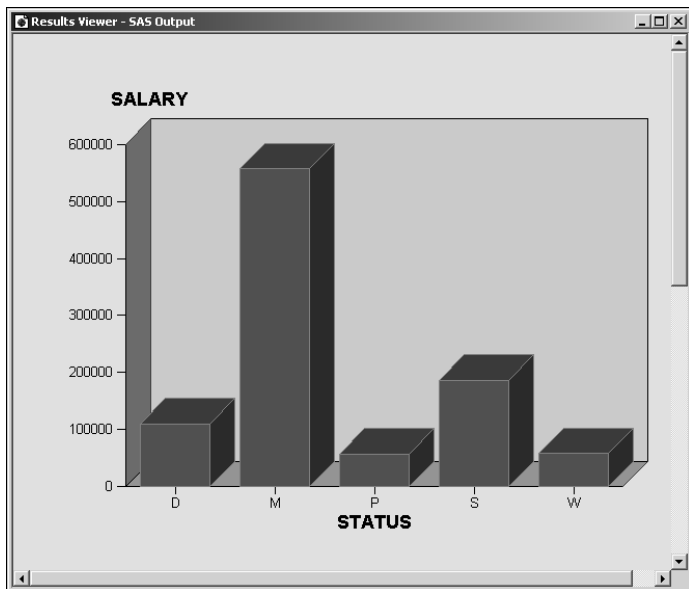
Numeric Formats			
lbw.d	Dw.s	FLOATw.d	FRACTw
MINGUOW	IBRw.d	IEEEw.d	LONGPROBw.d
PKw.d	MRBw.d	PCPIBw.d	PDw.d
RBw.d	PIBw.d	PIBRw.d	PVALUEw.d
S370FHEXw.d	ROMANw	SSNw	S370FFw.d
S370FRBw.d	S370FIBw.d	S370FIBUw.d	S370FPDw.d
S370FZDTw.d	S370FZDw.d	S370FZDLw.d	S370FZDSw.d
WORDSw	S370ZDUw.d	S370PIBw.d	WORDFw
ZDw.d	XPORTINT	XPORTFLT	Zw.d

With Version 8.1, Java output can support user-defined formats. Specific syntax is required to accommodate user-defined formats.

```

Program Editor - (Untitled)
Command ==>
00001 goptions reset=global
00002         reset=all
00003         device = java transparency;
00004
00005 ods html file="c:\mygif.html";
00006   proc gchart data=saved.demog;
00007     ubar3d status / sumvar = salary;
00008   run;
00009     pie3d gender / sumvar = age;
00010   run;
00011   quit;
00012 ods html close;
00013

```



Workshop

Exercise 1

Run the following program to produce output.

Right-click the mouse to use the fly-out menus and vary the presentation of the graph.

Then change the device to Java. Explore the fly-out menu options.

```

Program Editor - (Untitled)
Command ==>
00001 goptions reset = global
00002         reset = all
00003         device = activex transparency;
00004
00005 title j=left color = green
00006 "Vertical Bar Chart - 3D";
00007
00008 ods html file = "c:\graphic.html";
00009 proc gchart data=saved.demog;
00010     vbar3d status / sumvar=salary;
00011 run;
00012 quit;
00013 ods html close;
00014
00015 title;
  
```

Workshop Solutions

Exercise 1

Please consult your instructor for the solution to this exercise.