

Getting Started with SAS ODS (Output Delivery System) the Easy Way: Custom-Present Tables & Graphs Via the Web, without Mastering PROC TEMPLATE

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Click either image to hear the thunder.
When it's over, click refresh to restart the lightning show.

Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
July	F	14	64.3	90.0

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Student Analyses
Student Height Analysis
Student Gender Analysis

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SAS can run on almost any platform
SAS can access almost any data
SAS can perform almost any analysis
ODS can deliver in almost any format

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Scope / Agenda

- create .html files with ODS
- PROC PRINT*, table layout
- fonts, colors, color-coding data
- images, audio, video, special effect
- Graphic Procs: GCHART, GPLOT
- pop-up text, drill-downs, crosslinks
- *Also applicable to TABULATE/REPORT

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Tools Used

Mainly

- ODS statements
 - STYLE= parameter in PROC PRINT
- Also
- HTML
 - PROC TEMPLATE

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About ODS Code in these Slides

Standard ODS Code Block:

```
ods html  
  file= ...  
  style= ...; /* style spec is optional */  
your PROC step(s)  
ods destination close;  
/* this code not shown every time */
```

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About ODS Code for these Slides

In assignments like

```
file='c:\EasyODS\filename.ext' or  
src='c:\EasyODS\filename.ext'
```

I actually used subfolders (my option)

Your follow-up responsibility:

find out about PATH=, GPATH=, URL=

➤ At end of presentation, I will discuss assignments and links for relocatability!!!

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Recommended Companions

goptions reset=all;

ods noresults;

ods listing close;

ods dest ...;

your PROC step(s)

ods dest close;

ods listing;

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goptions reset=all;

- Even when you are not doing graphs, there is interplay between GOPTIONS and ODS
- Site GOPTIONS defaults may affect
- GOPTIONS from a graph PROC earlier in same program, session, or batch job may affect later ODS step

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ods noresults;

- prevents automatic open of output when creation is complete

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ods listing close;

...

ods listing;

- Prevents writing of extra output copy, without web-page formatting, to the traditional listing destination

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For More Information

- SAS Manuals on ODS
 - Version 8 “Complete” Guide (not complete)
 - Version 9 is much thicker
- How-To chapters in:
 - SAS Procedures Guide
 - SAS/GRAPH Software: Reference
- Lauren Haworth’s Book:
Output Delivery System, The Basics
- SAS.COM

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Available By Email (I Like These)

Papers by LeRB (approximate titles)

- Get the Best Out of ODS, SAS, SAS/GRAPH*
- Communication-Effective Web Design
- How To Work With Images
- How to Build a Better Table of Contents
- *A Landmark Paper (21 pages) with Francesca Pierni;
wide ranging detailed demonstration of what SAS
can do for the web, and how to do it well.

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Data for Examples (except Plot)

sashelp.class

- split by height category
- split by gender category
- membership counts for categories

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Obs	Name	Sex	Age	Height	Weight
1	Alfred	M	14	69.0	112.5
2	Alice	F	13	56.5	84.0
3	Barbara	F	13	65.3	98.0
4	Carol	F	14	62.8	102.5
5	Henry	M	14	63.5	102.5
6	James	M	12	57.3	83.0
7	Jane	F	12	59.8	84.5
8	Janet	F	15	62.5	112.5
9	Jeffrey	M	13	62.5	84.0
10	John	M	12	59.0	99.5
11	Joyce	F	11	51.3	50.5
12	Judy	F	14	64.3	90.0
13	Louise	F	12	56.3	77.0
14	Mary	F	15	66.5	112.0
15	Philip	M	16	72.0	150.0
16	Robert	M	12	64.8	128.0
17	Ronald	M	15	67.0	133.0
18	Thomas	M	11	57.5	85.0
19	William	M	15	66.5	112.0

Lib.Height, Lib.Gender

	HeightCategory	Count
1	GT 64 inches	8
2	LE 64 inches	11

	Count	Gender
1	9	Female
2	10	Male

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Lib.LE64 height le 64, Lib.Female

	Name	Sex	Age	Height	Weight
1	Alice	F	13	56.5	84
2	Carol	F	14	62.8	102.5
3	Henry	M	14	63.5	102.5
4	James	M	12	57.3	83
5	Jane	F	12	59.8	84.5

	Name	Sex	Age	Height	Weight
1	Alice	F	13	56.5	84
2	Barbara	F	13	65.3	98
3	Carol	F	14	62.8	102.5
4	Jane	F	12	59.8	84.5
5	Janet	F	15	62.5	112.5

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```
ods noresults;
ods listing close;
ods html file=
  'c:\EasyODS\sashelp\CLASSsasHTML.html';
title1 'Title will be displayed';
title2 'But date and page number will not';
proc print data=sashelp.class noobs;
run;
ods html close;
ods listing;
```

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Name	Sex	Age	Height	Weight
Alfred	M	14	69.0	112.5
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
Henry	M	14	63.5	102.5
James	M	12	57.3	83.0
Jane	F	12	59.8	84.5
Janet	F	15	62.5	112.5
Jeffrey	M	13	62.5	84.0
John	M	12	59.0	99.5
Joyce	F	11	51.3	50.5
Judy	F	14	64.3	90.0
Louise	F	12	56.3	77.0
Mary	F	15	66.5	117.0

What the Web Page Looks Like

- styles.default is used
 - gray backgrounds (page & table)
 - some text in color
 - some text in Italic
- no value added
- meant to show it's not printer text?

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```
proc template; /* simplify the table */
edit styles.SASorig as styles.Simpler;
style Output from Container /
  rules = NONE /* turn off grid */
  frame = VOID /* turn off grid */
  cellspacing = 0; /* turn off grid */
end;
run;
```

SASorig is PRINTER or DEFAULT

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Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
Jane	F	12	59.8	84.5
Janet	F	15	62.5	112.5
Joyce	F	11	51.3	50.5
Judy	F	14	64.3	90.0
Louise	F	12	56.3	77.0
Mary	F	15	66.5	112.0

Direct Customization of ODS Tables

PROC PRINT, TABULATE, and REPORT:

- style(location)=
 - location is DATA, HEADER, TOTAL, etc.
- just a few of the customizable aspects:
 - foreground (i.e., color of text) ,
 - background (i.e., color of fill for cell),
 - font_face, font_weight, font_size
 - just (justify)

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Color **Excess**: for Demo, **NOT** recommended

Age	Name	Height
13	Alice	56.5
	Barbara	65.3
13		121.8
N = 2		
14	Carol	62.8
	Judy	64.3
14		127.1
		248.9
N = 2		
Total N = 4		

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```
proc sort data=sashelp.class
    out=ToPrint;
where name in
('Alice' 'Barbara' 'Carol' 'Judy');
by Age Name;
run;
```

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```
ods listing close;
ods html body='c:\EasyODS\StylePRINTER.html'
    style=styles.printer;
title color=CX009900
    font='Rockwell'
    height=12 pt
    justify=L 'Age & Height'
    justify=L 'in sashelp.class';
/* PROC PRINT step here */
ods html close; ods listing;
```

/* SAS/GRAPH text formatting works for table titles and footnotes when using ODS */

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/* the basic PROC PRINT */

```
proc print data=ToPrint label N;
by age;
id age;
sumby age;
var name height;
sum height;
run;
```

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Microsoft Internet Explorer

Address | http://c:\easyods\styleprinter.html

PROC PRINT
using PRINTER style

Age	Name	Height
13	Alice	56.5
	Barbara	65.3
13		121.8
N = 2		
14	Carol	62.8
	Judy	64.3
14		127.1
		248.9
N = 2		
Total N = 4		

Done

PROC PRINT
using PRINTER style

Age	Name	Height
13	Alice	56.5
	Barbara	65.3
13		121.8
N = 2		
14	Carol	62.8
	Judy	64.3
14		127.1
		248.9
N = 2		
Total N = 4		

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```
proc print data=ToPrint label N ...;
by age;
id age / ...;
sumby age;
var name / ...;
var height;
sum height / ...;
run;
/* ... are the ODS style parameters */
```

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/ Try to customize grand total */*

```
proc print data=ToPrint label N
style(grand) =
[background=CX996600
foreground=CXFF9900
font_face=Rockwell
font_weight=Bold];
```

/ This does not work */*

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```
proc print data=ToPrint label N
style(header) =
[font_face=Rockwell font_weight=Bold]
style(data) =
[font_face=Rockwell font_weight=Bold]
style(total)=
[background=magenta foreground=cyan
font_face=Rockwell font_weight=Bold]
style(N) =
[background=cyan foreground=magenta
font_face=Rockwell font_weight=Bold];
```

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style(header), style(data), style(total), and style(N)
parameters assigned on the PROC PRINT statement

Age	Name	Height
13	Alice	56.5
	Barbara	65.3
13		121.8
N = 2		
14	Carol	62.8
	Judy	64.3
14		127.1
		248.9
N = 2		
Total N = 4		

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```
id age /
style(header) =
[background=blue
foreground=red
font_face=Rockwell
font_weight=Bold]
style(data) =
[background=red
foreground=blue
font_face=Rockwell
font_weight=Bold];
```

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Also, style(header) and style(data)
parameters assigned on the ID Age statement

Age	Name	Height
13	Alice	56.5
	Barbara	65.3
13		121.8
N = 2		
14	Carol	62.8
	Judy	64.3
14		127.1
		248.9
N = 2		
Total N = 4		

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```
var name /
  style(header) =
    [background=black foreground=CX999999]
  style(data) =
    [background=CX999999 foreground=black];
```

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Also, style(header) and style(data)
parameters assigned on the VAR Name statement

Age	Name	Height
13	Alice	56.5
	Barbara	65.3
13		121.8
N = 2		
14	Carol	62.8
	Judy	64.3
14		127.1
		248.9
N = 2		
Total N = 4		

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```
sum height /
  style(header) =
    [background=CX009900 foreground=yellow]
  style(data) =
    [background=yellow foreground=CX009900]
  style(total) =
    [background=black foreground=white
     font_face=Rockwell font_weight=Bold];
/* style(grand) would not work
   on SUM statement either */
```

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```
/* total style from PROC PRINT */
proc print data=ToPrint label N ...
  style(total)=
    [background=magenta foreground=cyan
     font_face=Rockwell font_weight=Bold];
/* subtotal style from SUM statement
   to override colors from PROC PRINT */
sum height / ...
  style(total) =
    [background=black foreground=white
     font_face=Rockwell font_weight=Bold];
```

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```
/* total style from PROC PRINT */
proc print data=ToPrint label N ...
  style(total)=
    [background=magenta foreground=cyan
     font_face=Rockwell font_weight=Bold];

/* subtotal style from SUM statement
   to override colors from PROC PRINT */
sum height / ...
  style(total) =
    [background=black foreground=white
     font_face=Rockwell font_weight=Bold];
```

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Also, style(header), style(data), and style(total)
parameters assigned on the SUM Height statement

Age	Name	Height
13	Alice	56.5
	Barbara	65.3
13		121.8
N = 2		
14	Carol	62.8
	Judy	64.3
14		127.1
		248.9
N = 2		
Total N = 4		

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Color-Code Data & Use Thicker Text

```
proc format lib=work;
value $SexCol
'F' = 'CXFF9999' 'M' = 'CX9999FF'; run;
proc print data=TwoGirlsAndTwoBoys label noobs
style(header) = [font_face = Rockwell] /* readability */
style(data) =
[font_face = Rockwell font_weight=Bold]; /* readability */
var Name;
var Sex / style = [background = $SexCol.];
var Age Height Weight; run;
```

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Color-Coded Data
Rockwell Bold Font for Readability on Color Background

Name	Sex	Age	Height	Weight
Alfred	M	14	69.0	112.5
Alice	F	13	56.5	84.0
John	M	12	59.0	99.5
Mary	F	15	66.5	112.0

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More Customization of ODS Tables

For PROC PRINT, customize:

- table grid and frame
- horizontal/vertical data justification
- cell width and cell height
- font weight, style, and weight
- column label design
- "pretext" and "posttext"

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```
/* customized grid and font */
```

```
proc print data=ToPrint label noobs
style = [
bordercolordark=CX000000
bordercolorlight=CXFF0000
borderwidth=12
background=CX999999
cellspacing=6
cellpadding=24
font_face=Rockwell
];
run;
```

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Step 1: Adjusting font_face & creating fancy table grid and border via STYLE= on the PROC PRINT Statement

Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
Judy	F	14	64.3	90.0

Footnote, if any, appears here.

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```
/* simplify the color scheme */
```

```
proc print data=ToPrint label noobs
style = [
bordercolor=CXFF0000
borderwidth=12
background=CX999999
cellspacing=6
cellpadding=24
font_face=Rockwell
];
run;
```

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Step 2: Simpler color scheme for the table frame & grid
via STYLE= on the PROC PRINT Statement

Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
Judy	F	14	64.3	90.0

Footnote, if any, appears here.

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/* turning off the table "rules" */

```
proc print data=ToPrint label noobs
style = [
bordercolor=CXFF0000
borderwidth=12
rules=none
background=CX999999
cellspacing=6
cellpadding=24
font_face=Rockwell
];
run;
```

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Step 3: Turning off the table "rules"
via STYLE= on the PROC PRINT Statement

Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
Judy	F	14	64.3	90.0

Footnote, if any, appears here.

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/* turning off the table frame */

```
proc print data=ToPrint label noobs
style = [
bordercolor=CXFF0000 /* no effect now */
borderwidth=12 /* no effect now */
frame=void /* void frame = no border */
rules=none
background=CX999999
cellspacing=6
cellpadding=24
font_face=Rockwell];
run;
```

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Step 4: Turning off the table frame
via STYLE= on the PROC PRINT Statement

Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
Judy	F	14	64.3	90.0

Footnote, if any, appears here.

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/* turning off the rest of the grid */

```
proc print data=ToPrint label noobs
style = [
bordercolor=CXFF0000 /* no effect */
borderwidth=12 /* no effect */
frame=void /* void frame = no border */
rules=none
background=CX999999 /* no effect now */
cellspacing=0 /* background cannot appear */
cellpadding=24
font_face=Rockwell];
run;
```

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Step 5: Turning off the rest of the grid
via STYLE= on the PROC PRINT Statement

Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
Judy	F	14	64.3	90.0

Footnote, if any, appears here.

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```
/* making column labels
match the data cells */

proc print data=ToPrint label noobs
style = [same as before]
style(header) =
[background=CXFFFFFF
font_weight=Medium];
run;
```

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Step 6: Making column label font & background same as for the data
via STYLE(HEADER)= on the PROC PRINT Statement

Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
Judy	F	14	64.3	90.0

Footnote, if any, appears here.

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```
/* customizing the data cells */

proc print data=ToPrint label noobs
style(data) = [
cellheight=64 pt
cellwidth=100 pt
font_weight=Bold
font_style=Italic
font_size=20 pt
just=center
vjust=top
];
run;
```

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Adjusting font_weight, font_style, font_size
cell dimensions, justification, and vertical justification
via STYLE(DATA)= on the PROC PRINT Statement

Name	Sex	Age	Height	Weight
<i>Alice</i>	<i>F</i>	<i>13</i>	<i>56.5</i>	<i>84.0</i>
<i>Barbara</i>	<i>F</i>	<i>13</i>	<i>65.3</i>	<i>98.0</i>
<i>Carol</i>	<i>F</i>	<i>14</i>	<i>62.8</i>	<i>102.5</i>
<i>Judy</i>	<i>F</i>	<i>14</i>	<i>64.3</i>	<i>90.0</i>

Footnote, if any, appears here.

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Hierarchy of Customization

- If no STYLE= on ODS HTML statement, use STYLES.DEFAULT
- Use STYLE= assignment
- Overrides via STYLE parameters on PROC PRINT
- Overrides via STYLE parameters on VAR, ID, SUM statements

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```
/* customize header & data on PROC PRINT */
proc print data=ToPrint label noobs
style(header) = [
foreground=CXFFFF00 background=CX009900
cellheight=64 pt cellwidth=100 pt
font_face=Rockwell font_weight=Bold
font_style=Italic font_size=20 pt
just=center vjust=top]
style(data) = [
foreground=CX009900 background=CXFFFF00
remainder same as above ];
var Name Age; var Age; /* note a dupe VAR */
run;
```

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SAS Output - Microsoft Internet Explorer - [Working Offline]

Using STYLE(HEADER) & STYLE(DATA) on PROC PRINT statement with VAR Name Age & VAR Age statements

Name	Age	Age
Alice	13	13
Barbara	13	13
Carol	14	14
Judy	14	14

Done My Computer

```
/* override header & data on VAR Age */
proc print data=ToPrint label noobs
remainder same as before ;
var Name Age;
var Age /
style(header) = [just=left vjust=bottom
foreground=CX009900 background=CXFFFF00
font_face=Rockwell font_weight=Medium
font_style=Roman font_size=16 pt]
style(data) = [ just=left vjust=bottom
foreground=CXFFFF00 background=CX009900
font_face=Rockwell font_weight=Medium
font_style=Roman font_size=16 pt];
run;
```

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SAS Output - Microsoft Internet Explorer - [Working Offline]

Keep STYLE(HEADER) & STYLE(DATA) on PROC PRINT statement but override with the extra 'VAR Age' statement

Name	Age	Age
Alice	13	13
Barbara	13	13
Carol	14	14
Judy	14	14

Done My Computer

```
proc print data=ToPrint label noobs
style(data)=[pretext='ABC' posttext=' XYZ'];
run;
```

STYLE(DATA) can also be used this way on VAR, ID, SUM statements

Name	Sex	Age	Height	Weight
ABC Alice XYZ	ABC F XYZ	ABC 13 XYZ	ABC 56.5 XYZ	ABC 84.0 XYZ
ABC Barbara XYZ	ABC F XYZ	ABC 13 XYZ	ABC 65.3 XYZ	ABC 98.0 XYZ
ABC Carol XYZ	ABC F XYZ	ABC 14 XYZ	ABC 62.8 XYZ	ABC 102.5 XYZ
ABC Judy XYZ	ABC F XYZ	ABC 14 XYZ	ABC 64.3 XYZ	ABC 90.0 XYZ

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```
proc print data=ToPrint label noobs
style=[preimage='c:\EasyODS\Shiny.jpg'];
run;
```

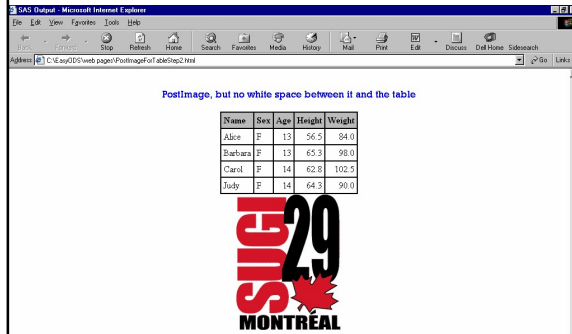
SAS Output - Microsoft Internet Explorer

Preimage, but too little white space between it and the table



Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84.0
Barbara	F	13	65.3	98.0
Carol	F	14	62.8	102.5
Judy	F	14	64.3	90.0

```
proc print data=ToPrint label noobs
style=[postimage='c:\EasyODS\sugi_logo.gif'];
run;
```



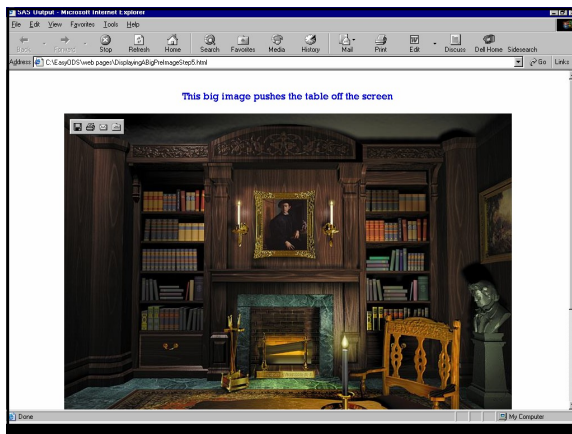
/* I want to use a big image
I found it in a Windows folder
It's 800 pixels X 600 pixels */

```
proc print data=ToPrint label noobs
style = [preimage=
'c:\EasyODS\images\WhoseRoom.jpg'];
run;
```

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/* shrink the image to 400 X 300
(preserving "aspect ratio") */

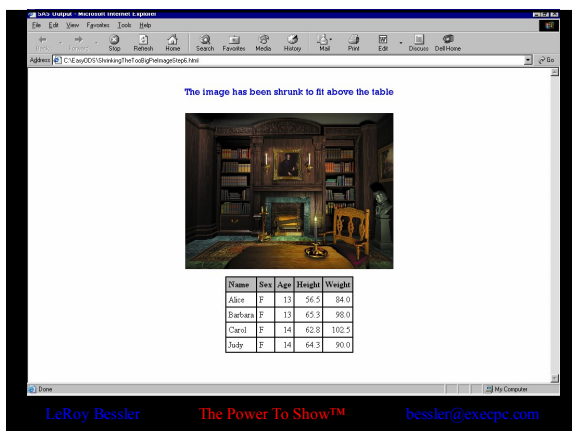
```
proc print data=ToPrint label noobs
style = [prehtml =
"<img src=
'c:\EasyODS\images\WhoseRoom.jpg'
vspace=10
width=400 height=300>"];
run;
```

/* get white space between image & table */

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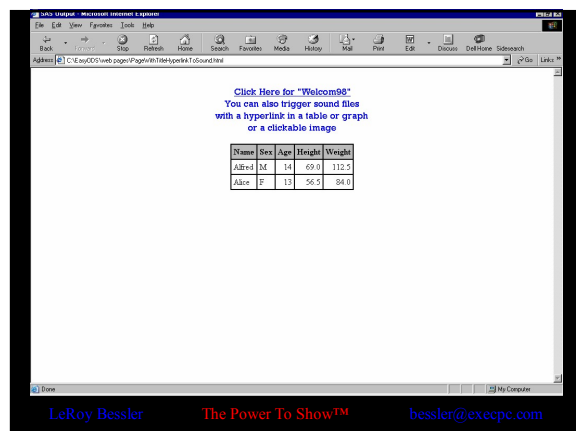
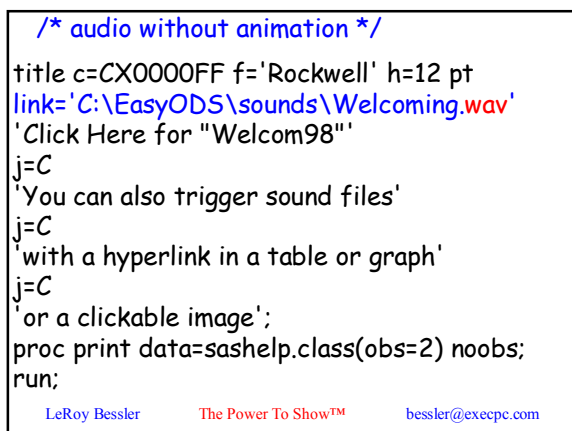
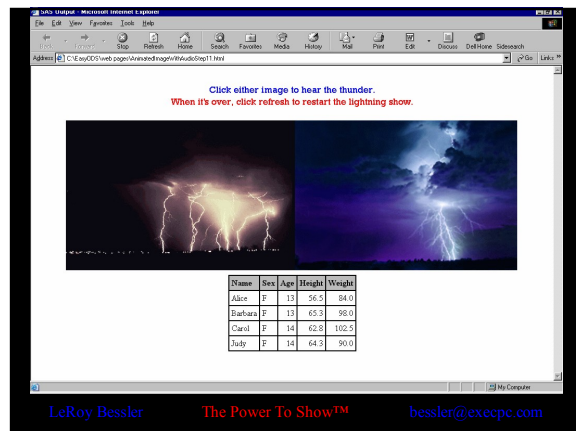
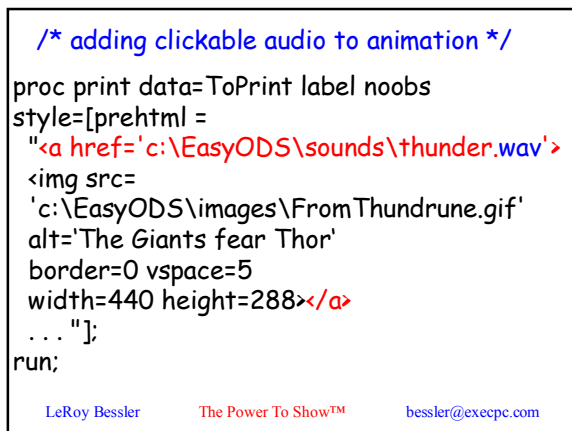
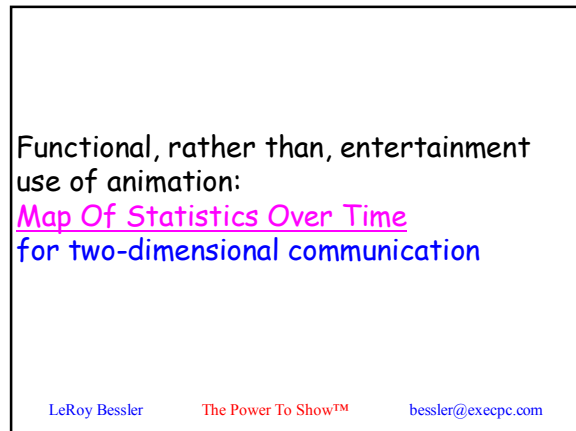
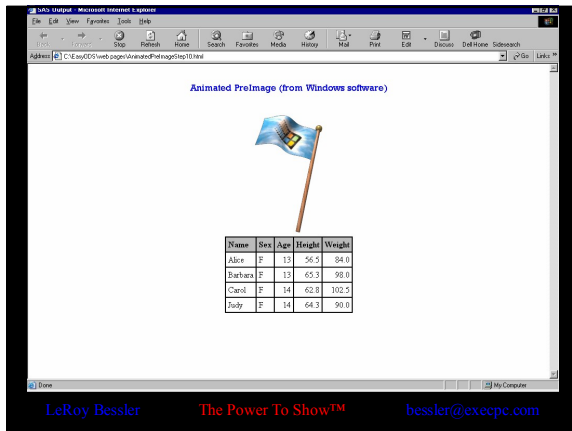
/* to use animation,
just get an animated gif,
or build one with SAS/GRAPH */

```
proc print data=ToPrint label noobs
style = [preimage=
'c:\EasyODS\images\FlagWaving.gif'];
run;
```

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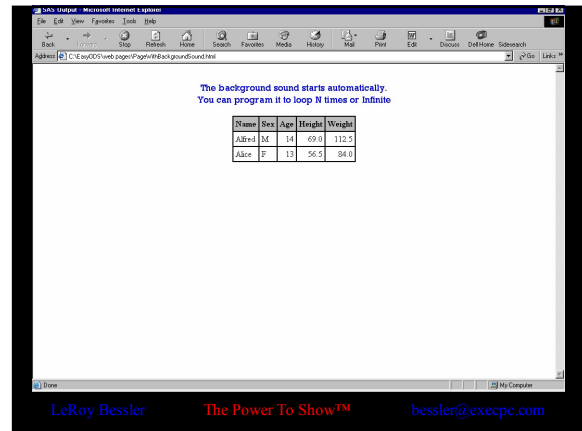
```
/* background audio */
```

```
title c=CX0000FF f='Rockwell' h=12 pt
'The background sound starts automatically.'
j=C
'You can program it to loop N times or
Infinite';
proc print data=sashelp.class(obs=2) noobs
style = [prehtml=
'<bgsound src=
"C:\EasyODS\sounds\MusicalOpen.wav">'];
run;
```

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```
/* continuous background audio */
```

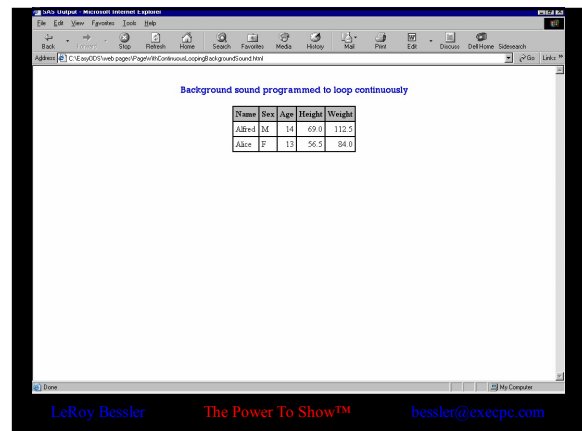
```
proc print data=sashelp.class(obs=2) noobs
style = [prehtml=
'<bgsound
src="C:\EasyODS\sounds\MusicalOpen.wav"
loop=infinite>'];
run;
```

```
/* for two repetitions, use loop=2 */
```

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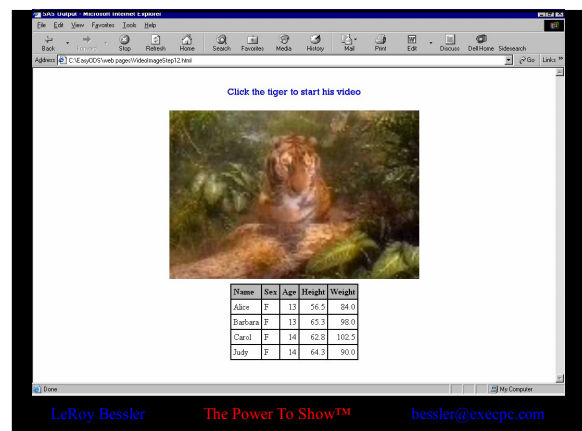
```
/* you, too, can do video */
```

```
proc print data=ToPrint label noobs
style=[prehtml =
"<a href='c:\EasyODS\videos\tiger.avi'>
<img src=
'c:\EasyODS\images\TigerScreenShot.jpg'
alt='It is a jungle out there. . . '
border=0 vspace=5></a>"];
run;
```

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```

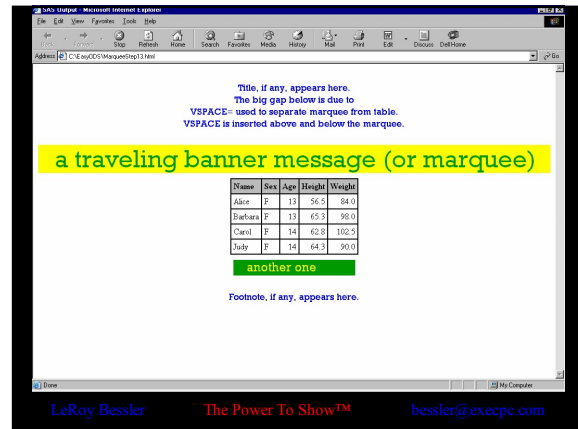
/* create a marquee above and/or below */
proc print data=ToPrint label noobs
style=[
prehtml =
"<font face=Rockwell size=7 color=#009900>
<marquee bgcolor=#FFFF00
height=50 vspace=10 width=100% hspace=0>
a traveling banner message (or marquee)
</marquee>
</font>"
posthtml = ...];
run;

```

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Real Example

- Table of Contents
 - hand-made, not ODS default*
- Tables, Pie Chart, Bar Chart, Plot
- Pop-Up Text
- Drill-Down Links
- CrossLinks
- *To customize the ODS default html TOC, see my prior work

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Simplify the ODS Minimal Style

```

proc template;
edit styles.Minimal as styles.MinimalLeRB;
style Output from Container /
rules = NONE /* turn off table grid */
frame = VOID /* turn off table grid */
cellspacing=0; /* turn off table grid */
style body / pagebreakhtml=_undef_;
/* suppress rule between PROCs */
end; run;

```

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ODS Minimal Style without Separator between PROCs

```

proc template;
edit styles.Minimal as
styles.MinimalNoPROCsep;
style body / pagebreakhtml=_undef_;
end;
run;

```

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Hand-Made Table of Contents

```

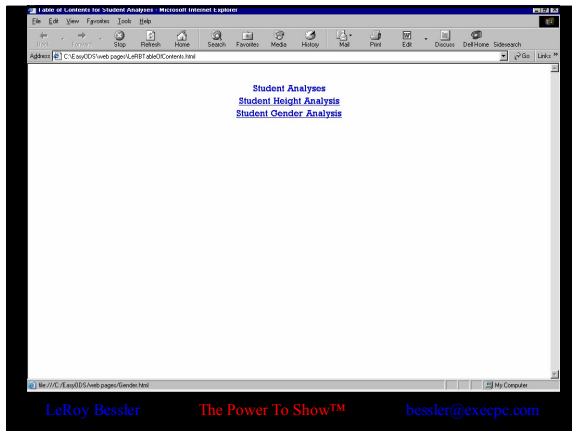
ods html file='...'
(title='Table of Contents for Student Analyses')
style=styles.MinimalLeRB;
title1 color=CX0000FF font=Rockwell height=14 pt
'Student Analyses'
j=C link='Height.html' 'Student Height Analysis'
j=C link='Gender.html' 'Student Gender Analysis';
proc print data=Lib.FakeData noobs label; run;
ods html close;

```

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title= and metatext=

- Used by Internet Search engines & robots
- Improve chances that people will find your web page(s)

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Pie Chart with Pop-Ups & Drill-Down

```

options device=gif xpixels=600 ypixels=450
  htext=16 pt ftext='Georgia';
ods html file='...' (title='...')
  style=styles.MinimalLeRB gpath='C:\EasyODS\graphs';
/* PROC GCHART step */
title1 font=Rockwell height=14 pt
  link='...' 'link description'; /* CrossLinks */
footnote1;
proc print data=Lib.FakeData noobs label;
run; ods html close; /* invisible table */

```

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Prep Data with HTML code

```

data Lib.HeightWithHREF;
length GraphElementLink $ 200;
set Lib.Height;
if HeightCategory eq 'GT 64 inches'
then GraphElementLink =
  'href="ListingGT64.html" /* drill-down link */
  alt="Click for Students Taller ..."; /* pop-up */
else GraphElementLink =
  'href= " ... " alt= " ... "'; run;

```

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Pie Chart PROC Step

```

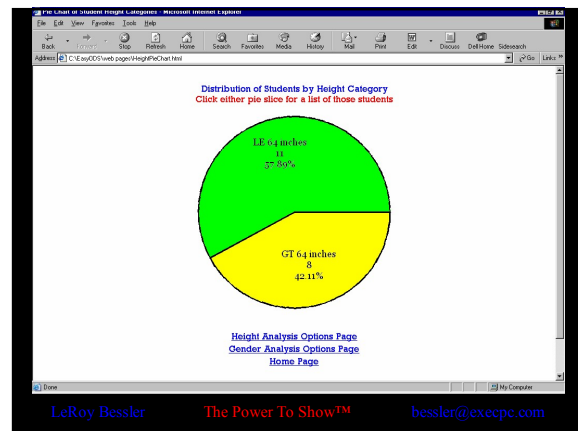
title1 ...;
footnote;
pattern1 ...; pattern2 ...;
proc gchart data=Lib.HeightWithHREF;
pie HeightCategory / name='HTPIE'

...

  html=GraphElementLink;
run; quit;

```

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Bar Chart PROC Step

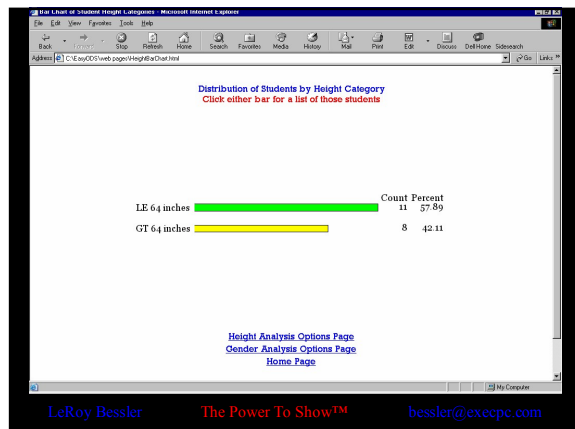
```
title1 ...;
footnote;
pattern1 ...; pattern2 ...;
proc gchart data=Lib.HeightWithHREF;
hbar HeightCategory / name='HTBAR'

...
html=GraphElementLink;
run; quit;
```

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Prep Plot Data with HTML code - Step 1

```
proc summary data=sashelp.class nway;
class Age;
var Height;
output out=ToPrep mean=AvgHeight;
run;
data Lib.HeightVsAgeWithHREF;
...
run;
```

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Prep Plot Data with HTML code - Step 2

```
/* PROC SUMMARY created ToPrep */
data Lib.HeightVsAgeWithHREF;
length GraphElementLink $ 200;
set ToPrep;
AvgHeight = round(AvgHeight,0.1);
GraphElementLink =
'href="Age" || trim(left(Age)) || ".html" alt="Height='
|| trim(left(AvgHeight)) || 'OD'X
|| 'Click for Age=' || trim(left(Age)) || ' Students'";
run;
```

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What GraphElementLink Looks Like

For Age 13, GraphElementLink is
[href="Age13.html" alt="Height=61.4'OD'XClick for Age=13 Students"](Age13.html)

If you look in the data set, the hexadecimal string 'OD'X is translated into a line break symbol.

If you copy the value from VIEWTABLE and paste it here, it displays with a line break as shown below:

[href="Age14.html" alt="Height=64.9Click for Age=14 Students"](Age14.html)

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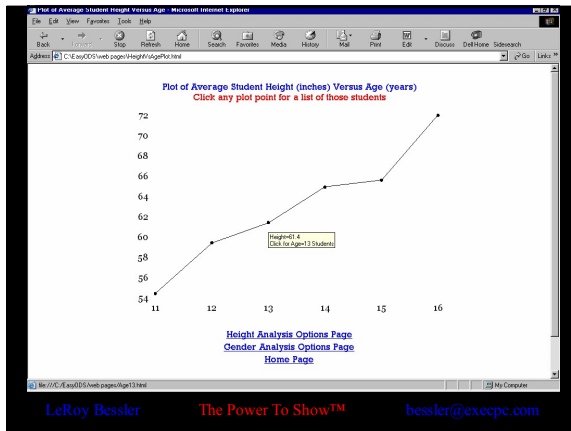
Now Plot the HTML-augmented Data

```
title1 ...; footnote;
symbol1 ...;
axis1 ...;
axis2 ...;
proc gplot data=Lib.HeightVsAgeWithHREF;
plot AvgHeight*Age / name='HTVSAGE'
vaxis=axis2 haxis=axis1
html=GraphElementLink;
run; quit;
```

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Prep for Student Info List by Age

```
proc sort data=sashelp.class(keep=Age)
    out=ToPrep nodupkey;
by Age; run;
data _null_;
set ToPrep end=LastOne;
call symput('AgeGroup' || trim(left(_N_)),
    trim(left(Age)));
if LastOne;
call symput('NumberOfAgeGroups',
    trim(left(_N_)));
run;
```

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```
%macro DoAgeLists;
%do i = 1 %to &NumberOfAgeGroups %by 1;
options reset=all; ods noresults; ods listing close;
ods html file="..." (title="...")
    style=styles.printer;
title1 ...; footnote1 ... link='...' '...';
proc print data=sashelp.class label noobs;
where Age eq &AgeGroup&i; run;
ods html close; ods listing;
%end; %mend DoAgeLists;
%DoAgeLists
run;
```

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Student Info for Age 13

Name	Sex	Age	Height	Weight
Alice	F	13	56.5	84
Barbara	F	13	62.5	90
Jeffrey	M	13	62.5	84

Back to Average Student Height Versus Age
Height Analysis Options Page
Gender Analysis Options Page
Home Page

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Pop-Up Text

- also known as: flyover/mouseover/hover/floatover text
- FLYOVER= (for tables) converts to title=
- your HTML (for tables) must be title=
- for graphs/images, you must use alt=

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Prep for Table with Drill-Downs and Pop-Ups

```
proc format lib=work;
value $SexLink
'Female' = '<a href='Female.html'
    title="Click for Female Student Info">
    Girls</a>'
'Male' = '<a href='Male.html'
    title="Click for Male Student Info">
    Boys</a>'; run;
```

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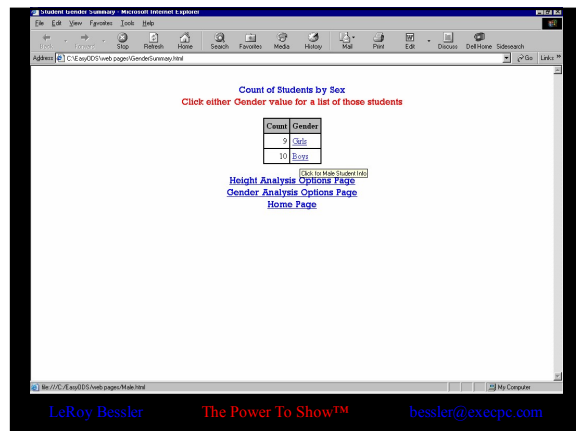
Table with Pop-Ups and Drill-Downs

```
proc print data=Lib.Gender noobs label;
var Count Gender;
format Gender $SexLink.;
run;
```

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Relocatable Web Pages

- context not web server or SAS/IntrNet
- Want these capabilities:
- move them to any folder on any disk
 - zip them up & email them
- so recipient can stage them as desired

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Simple Relocatable Web Page

```
ods html
  path='C:\AnyFolder\WebPages'
  file='ClassListing.html';
proc print data=sashelp.class;
run;
ods html close;
```

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CrossLinked Relocatable Web Page

```
ods html path='C:\AnyFolder\WebPages' file='Girls.html';
title 'Girls';
footnote link='Boys.html' 'Go To Boys';
proc print data=sashelp.class(where=(Sex eq 'F'));
run;
ods html path='C:\AnyFolder\WebPages' file='Boys.html';
title 'Boys';
footnote link='Girls.html' 'Go To Girls';
proc print data=sashelp.class(where=(Sex eq 'M'));
run;
ods html close;
```

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Relocatable Use of Images

```
ods html path='C:\AnyFolder\WebPages'
  file='ImgInParallelFolder.html';
proc print data=sashelp.class
  style = [postimage='.. /Images/Img.gif']; run;
ods html path='C:\AnyFolder\WebPages'
  file='ImgInHigherLevelFolder.html';
proc print data=sashelp.class
  style = [postimage='.. /Img.gif']; run;
ods html path='C:\AnyFolder\WebPages'
  file='ImgInWebPagesFolder.html';
proc print data=sashelp.class
  style = [postimage='Img.gif']; run;
```

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Relocatable Use of a Graph

```
proc catalog cat=work.gseg kill; run; quit;
options obs=4;
ods html path='C:\AnyFolder\WebPages'
    file='TableAndGraph.html' gpath='C:\AnyFolder\Graphs';
proc print data=sashelp.class; run;
goptions device=gif transparency
    xpixels=300 hpos=33 ypixels=225 vpos=16;
proc gchart data=sashelp.class;
axis1 style=0 label=none major=none;
axis2 style=0 label=none major=none minor=none value=none;
hbar Name / name='hbarcht' sumvar=Weight sumlabel='Weight'
    maxis=axis1 raxis=axis2 coutline=red width=1 space=1 noframe;
run; quit;
ods html close;
```

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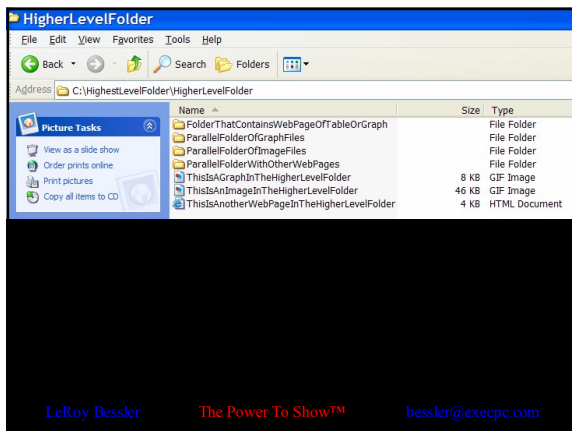
any hyperlinks inside relocatable tables or graphs

- must not include a drive letter or server
- can use any one of these forms:
 - TargetFileName.html
if in same folder as table or graph
 - ../ParallelFolderName/ParallelTarget.html
if in folder at same level as table/graph folder
 - ../HigherTarget.html
if in the folder that contains table/graph folder

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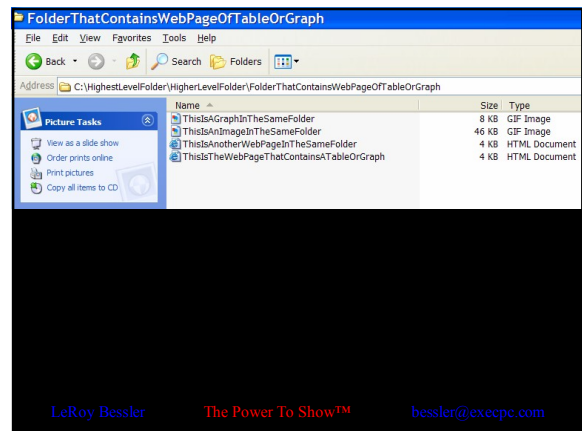
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hyperlinks inside relocatable tables or graphs

to point to a web page

in a lower level folder (i.e., in a subfolder)

use this:

- SubFolderName/TargetFileName.html

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