

An Introduction to Creating Multi-Sheet Microsoft Excel Workbooks the Easy Way with SAS®

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Goals

- Integrate SAS output w/ Excel
- Give you something you can use TODAY

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Software Requirements

- Base SAS, *any* operating system
- SAS 9.1.3 or later
- Modified version of the ExcelXP tagset
(see "More Tips and Tricks..." paper for details)
- Microsoft Excel XP or later (a.k.a. Excel 2002)

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 THE POWER TO KNOW.

General Steps

1. Run SAS code to create output
2. Store output where Excel can access it
3. Open output with Excel
4. Modify SAS code to correct formatting problems

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ODS Basics

- Part of Base SAS
- Easily generate multiple output types (HTML, RTF, PDF, XML, etc.)
- A "destination" creates the actual output
- A "style" controls the appearance
- Usage:

HTML or RTF or PDF ...

```
ods DestName style=StyleName file=... ;  
  * Your SAS procedure code here;  
ods DestName close;
```

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ODS Basics – Output for Excel

- Excel can open specially made XML files as multi-sheet workbooks (graphics not supported)
- Use the ExcelXP tagset and sansPrinter style:

```
ods listing close;  
ods tagsets.ExcelXP style=sansPrinter  
  file=... ;  
  * Your SAS procedure code here;  
ods tagsets.ExcelXP close;
```

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Sample SAS Code

```
title 'The CLASS Dataset';
footnote '(From the SASHELP library)';

proc print data=sashelp.class noobs;
  where (sex eq 'M');
  var name age height weight;
run; quit;

proc print data=sashelp.class noobs;
  where (sex eq 'F');
  var name age height weight;
run; quit;
```

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SAS Listing Output

Name	Age	Height	Weight
Alfred	14	69.0	112.5
Henry	14	63.5	102.5
James	12	57.3	83.0
...			

Name	Age	Height	Weight
Alice	13	56.5	84.0
Barbara	13	65.3	98.0
Carol	14	62.8	102.5
...			

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Using ODS and the ExcelXP Tagset

```
title 'The CLASS Dataset';
footnote '(From the SASHELP library)';

proc print data=sashelp.class noobs;
  where (sex eq 'M');
  var name age height weight;
run; quit;

proc print data=sashelp.class noobs;
  where (sex eq 'F');
  var name age height weight;
run; quit;
```

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Using ODS and the ExcelXP Tagset

```
ods tagsets.ExcelXP file='MyWorkbook.xml'
  style=sansPrinter;
```

```
title 'The CLASS Dataset';
footnote '(From the SASHELP library)';

proc print data=sashelp.class noobs;
  where (sex eq 'M');
  var name age height weight;
run; quit;

proc print data=sashelp.class noobs;
  where (sex eq 'F');
  var name age height weight;
run; quit;
```

```
ods tagsets.ExcelXP close;
```

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Open MyWorkbook.xml with Excel

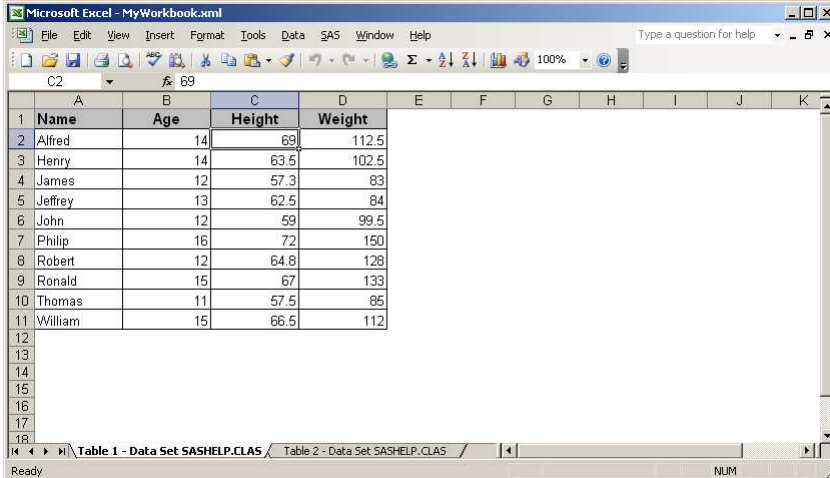
- Open Excel: Start > Programs > . . .
- File > Open
- Navigate to ...MyWorkbook.xml and click **Open**

~ OR ~

- Navigate to output directory and double-click **MyWorkbook.xml**

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MyWorkbook.xml Viewed with Excel



The screenshot shows a Microsoft Excel window titled "Microsoft Excel - MyWorkbook.xml". The spreadsheet contains a table with the following data:

	A	B	C	D	E	F	G	H	I	J	K
1	Name	Age	Height	Weight							
2	Alfred	14	69	112.5							
3	Henry	14	63.5	102.5							
4	James	12	57.3	83							
5	Jeffrey	13	62.5	84							
6	John	12	59	99.5							
7	Philip	16	72	150							
8	Robert	12	64.8	128							
9	Ronald	15	67	133							
10	Thomas	11	57.5	85							
11	William	15	66.5	112							
12											
13											
14											
15											
16											
17											
18											

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Run Setup.sas

1. Start SAS
2. File > Open Program
3. Select **Setup.sas** and click **Open**
4. Review code and submit
5. Keep editor window open for future reference

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Ex. 1 – Create the Initial Workbook

1. File > Open Program > **Exercise1.sas**
2. Follow TO DO instructions
3. View output in Excel:

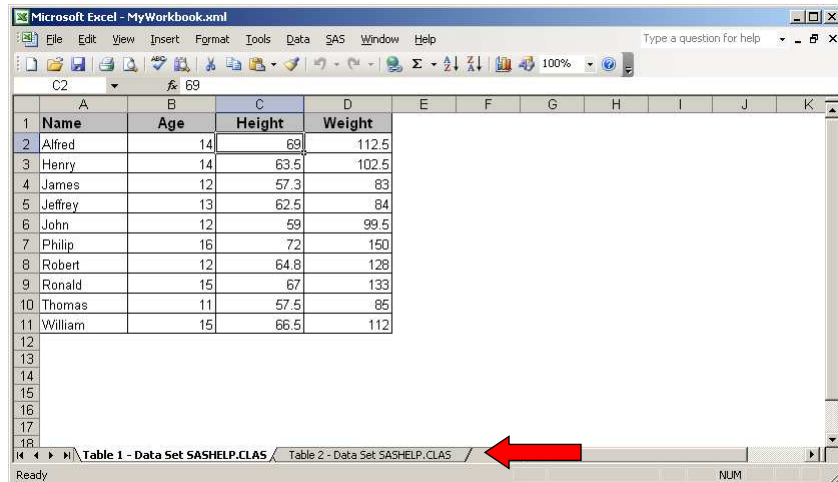
Start > Programs > ...

File > Open > **C:\HOW\DeIGobbo\MyWorkbook.xml**
4. Close the document (child) window (leave Excel running, but minimize it)

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Understanding and Using the ExcelXP Tagset Options

Supply Your Own Worksheet Names



	A	B	C	D	E	F	G	H	I	J	K
1	Name	Age	Height	Weight							
2	Alfred	14	69	112.5							
3	Henry	14	63.5	102.5							
4	James	12	57.3	83							
5	Jeffrey	13	62.5	84							
6	John	12	59	99.5							
7	Philip	16	72	150							
8	Robert	12	64.8	128							
9	Ronald	15	67	133							
10	Thomas	11	57.5	85							
11	William	15	66.5	112							
12											
13											
14											
15											
16											
17											
18											

ExcelXP Supports Tagset Options

- Syntax: `options(option-name='option-value')`

- Can control the worksheet name:

```
options(sheet_name='worksheet-name');
```

- Can have multiple ODS statements
- Options remain in effect until changed !

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Supply Your Own Worksheet Names

```
ods tagsets.ExcelXP style=sansPrinter file= ... ;  
title ...; footnote ...;
```

```
ods tagsets.ExcelXP options(sheet_name='Male  
Students');
```

```
proc print ...;  
  where (sex eq 'M');  
  ... ;  
run; quit;
```

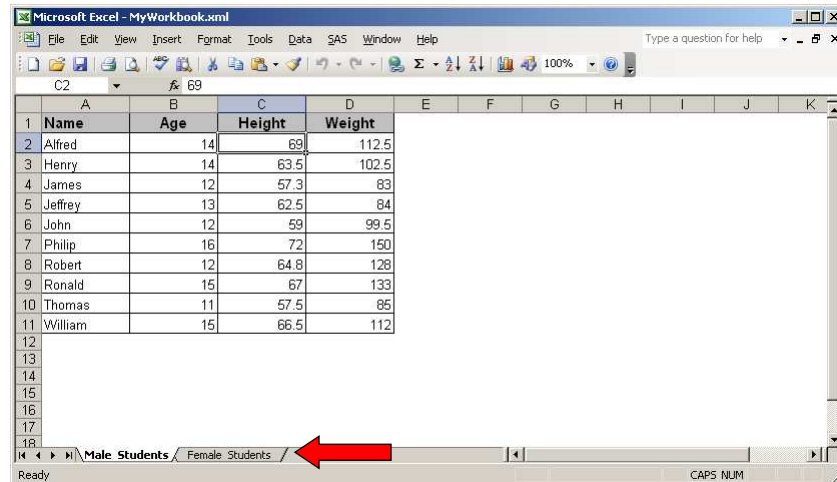
```
ods tagsets.ExcelXP options(sheet_name='Female  
Students');
```

```
proc print ...;  
  where (sex eq 'F');  
  ... ;  
run; quit;
```

```
ods tagsets.ExcelXP close;
```

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Supply Your Own Worksheet Names



The screenshot shows the Microsoft Excel interface with a worksheet named 'Male_Students'. The worksheet contains a table with the following data:

	A	B	C	D	E	F	G	H	I	J	K
1	Name	Age	Height	Weight							
2	Alfred	14	69	112.5							
3	Henry	14	63.5	102.5							
4	James	12	57.3	83							
5	Jeffrey	13	62.5	84							
6	John	12	59	99.5							
7	Philip	16	72	150							
8	Robert	12	64.8	128							
9	Ronald	15	67	133							
10	Thomas	11	57.5	85							
11	William	15	66.5	112							
12											
13											
14											
15											
16											
17											
18											

A red arrow points to the worksheet tab name 'Male_Students' in the bottom-left corner of the Excel window.

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Ex. 2 – Supply Worksheet Names

1. Go to SAS
2. File > Open Program > **Exercise2.sas**
3. Follow TO DO instructions
4. Go to Excel
5. File > \HOWDeIGobbo\MyWorkbook.xml
- or -
MyWorkbook.xml (from the recent file list)
6. Close the document (child) window (leave Excel running, but minimize it)

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Display Titles & Footnotes in Worksheet

- Title text → Excel print header
- Footnote text → Excel print footer
- Can control location of title & footnote text:

```
options(embedded_titles='yes'  
        embedded_footnotes='yes')
```

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Display Titles & Footnotes in Worksheet

```
ods tagsets.ExcelXP style=sansPrinter file= ... ;  
title ...; footnote ...;  
* Set some "global" tagset options;  
ods tagsets.ExcelXP  
options(embedded_titles='yes'  
        embedded_footnotes='yes');  
ods tagsets.ExcelXP options(sheet_name=...);  
proc print ...; run; quit;  
ods tagsets.ExcelXP options(sheet_name=...);  
proc print ...; run; quit;  
ods tagsets.ExcelXP close;
```

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Display Titles & Footnotes in Worksheet

The screenshot shows an Excel window with the following data:

The CLASS Dataset			
Name	Age	Height	Weight
Alfred	14	69	112.5
Henry	14	63.5	102.5
James	12	57.3	83
Jeffrey	13	62.5	84
John	12	59	99.5
Philip	16	72	150
Robert	12	64.8	128
Ronald	15	67	133
Thomas	11	57.5	85
William	15	66.5	112

(From the SASHELP library)

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Ex. 3 – Display Titles and Footnotes

1. Go to SAS
2. File > Open Program > **Exercise3.sas**
3. Follow TO DO instructions
4. Go to Excel
5. File > \HOWDeIGobbo\MyWorkbook.xml
- or -
MyWorkbook.xml (from the recent file list)
6. Close the document (child) window (leave Excel running, but minimize it)

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Can Also Have Print Headers & Footers

```
options(print_header='header-text'  
        print_footer='footer-text')
```

Example:

```
print_header='&C&A&RPage &P of &N'  
print_footer='&RPrinted &D at &T'
```

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Can Also Have Print Headers & Footers

```
print_header='&C&A&RPage &P of &N'  
print_footer='&RPrinted &D at &T'
```

Control Sequence	Function
&C	Center text
&A	Insert sheet name
&R	Right-justify text
&P	Insert page number
&N	Insert number of pages
&D	Insert date printed
&T	Insert time printed
&F	Insert file name
&Z	Insert file path

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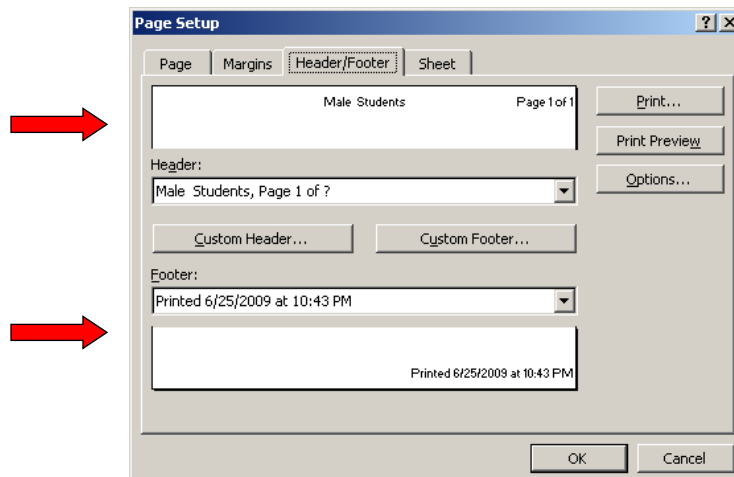
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Can Also Have Print Headers & Footers

```
ods tagsets.ExcelXP style=sansPrinter file= ... ;
title ...; footnote ...;
* Set some "global" tagset options;
ods tagsets.ExcelXP
  options(embedded_titles='yes'
          embedded_footnotes='yes'
          print_header='&C&A&RPage &P of &N'
          print_footer='&RPrinted &D at &T');
ods tagsets.ExcelXP options(sheet_name=...);
proc print ...; run; quit;
ods tagsets.ExcelXP options(sheet_name=...);
proc print ...; run; quit;
ods tagsets.ExcelXP close;
```

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Can Also Have Print Headers & Footers



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AutoFilters

Microsoft Excel - MyWorkbook.xml

The CLASS Dataset

Name	Age	Height	Weight
Alfred	14	69	112.5
Henry	14	63.5	102.5
James	12	57.3	83
Jeffrey	13	62.5	84
John	12	59	99.5
Philip	16	72	150
Robert	12	64.8	128
Ronald	15	67	133
Thomas	11	57.5	85
William	15	66.5	112

(From the SASHELP library)

Male Students / Female Students /

Ready CAPS NUM

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AutoFilters

Microsoft Excel - MyWorkbook.xml

The CLASS Dataset

Name	Age	Height	Weight
Alfred	14	69	112.5
Henry	14	63.5	102.5
James	12	57.3	83
Jeffrey	13	62.5	84
John	12	59	99.5
Philip	16	72	150
Robert	12	64.8	128
Ronald	15	67	133
Thomas	11	57.5	85
William	15	66.5	112

(From the SASHELP library)

Male Students / Female Students /

Ready CAPS NUM

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AutoFilters

The screenshot shows a Microsoft Excel window titled "Microsoft Excel - MyWorkbook.xml". The spreadsheet displays the following data:

	A	B	C	D	E	F	G	H	I	J	K
1	The CLASS Dataset										
2											
3	Name	Age	Height	Weight							
11	Ronald	15	67	133							
13	William	15	66.5	112							
14											
15	(From the SASHELP library)										
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											

The status bar at the bottom indicates "2 of 10 records found" and "NUM".

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AutoFilters

```
* Set some "global" tagset options;  
ods tagsets.ExcelXP  
  options(embedded_titles='yes'  
          embedded_footnotes='yes'  
          print_header='&C&A&RPage &P of &N'  
          print_footer='&RPrinted &D at &T'  
          autofilter='2');  
  
ods tagsets.ExcelXP options(sheet_name=...);  
proc print ...; run; quit;  
  
ods tagsets.ExcelXP options(sheet_name=...);  
proc print ...; run; quit;
```

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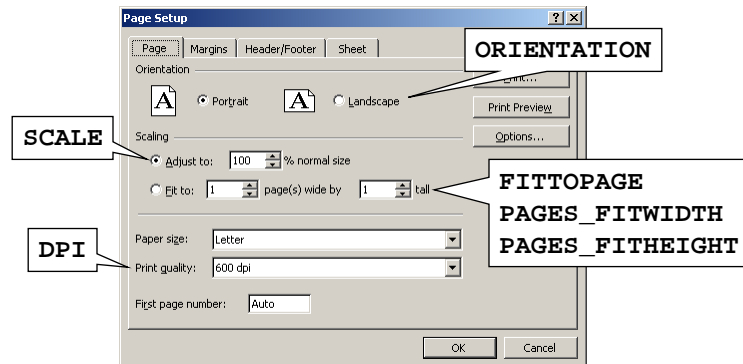
Ex. 4 – AutoFilters

1. Go to SAS
2. File > Open Program > **Exercise4.sas**
3. Follow TO DO instructions
4. Go to Excel
5. File > \HOWDeIGobbo\MyWorkbook.xml
- or -
MyWorkbook.xml (from the recent file list)
6. Close the document (child) window (leave Excel running, but minimize it)

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Print Options – Page Setup Dialog

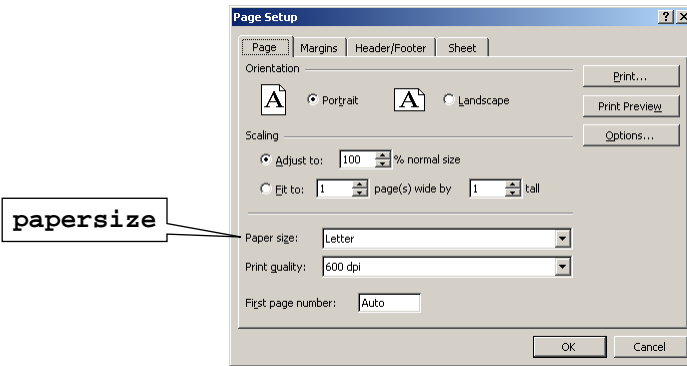
Tagset options



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Print Options – Page Setup Dialog

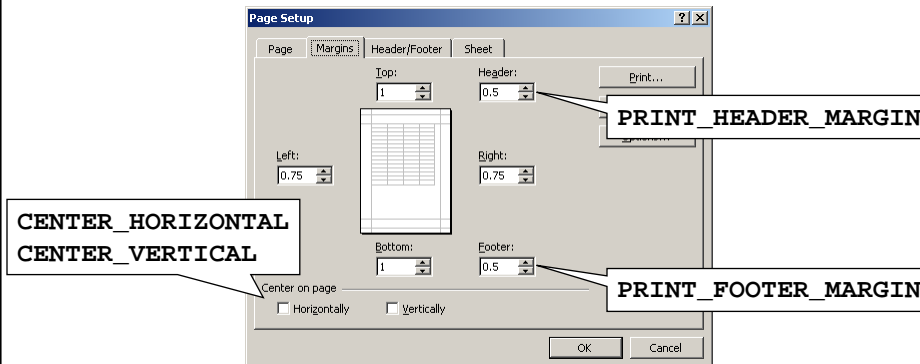
SAS system option, NOT tagset option



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Print Options – Page Setup Dialog

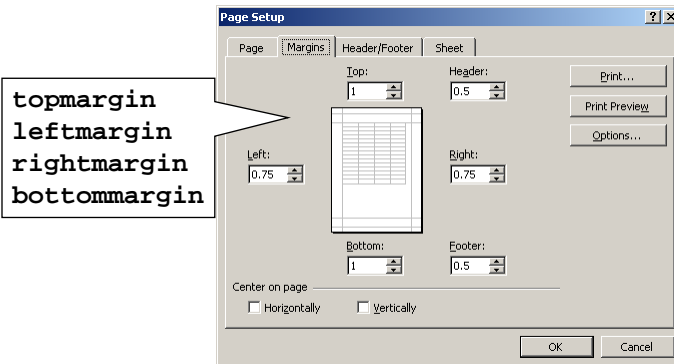
Tagset options



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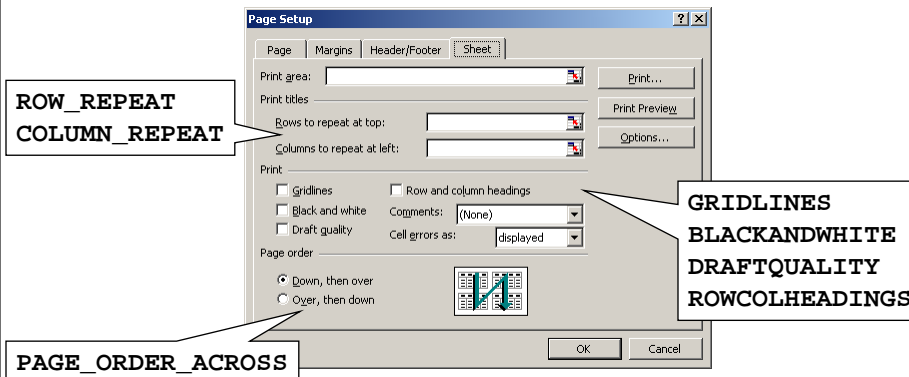
Print Options – Page Setup Dialog

SAS system options, NOT tagset options



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Print Options – Page Setup Dialog



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Understanding and Using ODS Style Overrides

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Changing Display Attributes and Number Formats

- Gender-appropriate background 😊
- 1 decimal place for Height and Weight
- Supported by PRINT, REPORT and TABULATE

Name	Age	Height	Weight
Alfred	14	69.0	112.5
Henry	14	63.5	102.5
James	12	57.3	83.0
Jeffrey	13	62.5	84.0
John	12	59.0	99.5
Philip	16	72.0	150.0
Robert	12	64.8	128.0
Ronald	15	67.0	133.0
Thomas	11	57.5	85.0
William	15	66.5	112.0

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

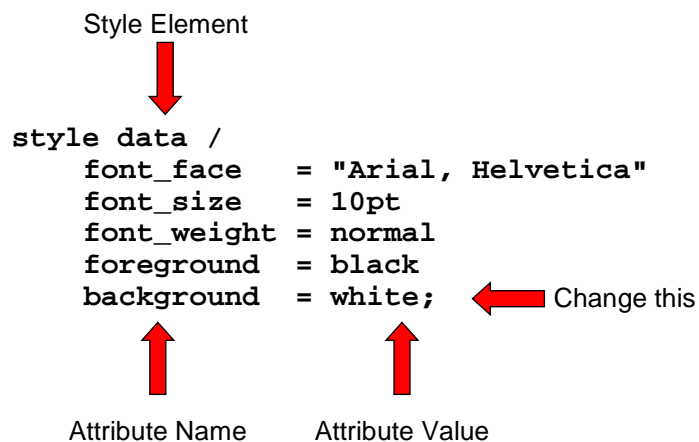
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Changing Display Attributes and Number Formats

1. Find an ODS style you like
2. Make a copy of the style
3. Change/add style elements/attributes
4. Use the new style elements















































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ODS Basics – Anatomy of an ODS Style



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Default Colors Supported by Excel 2002/2003

Black		#333399		#993300	
#333333		#666699		#993366	
Gray		Blue		#FF8080	
#969696		#0066CC		#FFCC99	
Silver		#3366FF		#FF99CC	
Teal		#00CCFF		Fuchsia	
#003300		#33CCCC		Red	
#333300		Aqua		#FF6600	
Green		#CCFFFF		#FF9900	
#339966		#99CCFF		#FFCC00	
Olive		#9999FF		Yellow	
#99CC00		#CCCCFF		#FFFF99	
Lime		#CC99FF		#FFF9CC	
#CCFFCC		Purple		White	
#003366		#660066			
Navy		Maroon			

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Make a Copy of the Style

```

proc template;
  define style styles.XLsansPrinter;
    parent = styles.sansPrinter;
  end;
run; quit;

```

New Style Name
↓
Original Style Name

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Change/Add Style Elements/Attributes

```
proc template;  
  define style styles.XLsansPrinter;  
    parent = styles.sansPrinter;  
    style data_male from data /  
      background=#99ccff;  
    style data_female from data /  
      background=#ff99cc;  
  end;  
run; quit;
```



New style elements (`data_male`, `data_female`) to override an existing attribute (`background`)

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Child Attributes Inherited from the Parent

data Style Element

```
font_face = ...  
font_size = ...  
font_weight = ...  
foreground = ...  
background = white
```



data_male Style Element

```
font_face = ...  
font_size = ...  
font_weight = ...  
foreground = ...  
background = white  
background = #99ccff
```

data_female Style Element

```
font_face = ...  
font_size = ...  
font_weight = ...  
foreground = ...  
background = white  
background = #ff99cc
```

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Use the New Elements

General style override syntax:

```
style(location)=style-specification
```

For our code:

```
var name age / style(Column)=data_male
```

```
var name age / style(Column)=data_female
```

Location

Style Element

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Location Values for PROC PRINT

table		
obsheader	header	header
obs	column	column
obs	column	column
obs	column	column
obs	column	column
obs	column	column
bylabel	total	total
grandtotal	grandtotal	grandtotal
n		

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Use the New Elements – Name & Age Only

```
ods tagsets.ExcelXP style=XLsansPrinter file= ... ;
* Other ODS statements here...
proc print data=sashelp.class noobs;
  where (sex eq 'M');
  var name age / style(Column)=data_male;
  var height weight;
run; quit;

* Other ODS statement here...
proc print data=sashelp.class noobs;
  where (sex eq 'F');
  var name age / style(Column)=data_female;
  var height weight;
run; quit;
ods tagsets.ExcelXP close;
```

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Use the New Elements – Name & Age Only

Name	Age	Height	Weight
Alfred	14	69	112.5
Henry	14	63.5	102.5
James	12	57.3	83
Jeffrey	13	62.5	84
John	12	59	99.5
Philip	16	72	150
Robert	12	64.8	128
Ronald	15	67	133
Thomas	11	57.5	85
William	15	66.5	112

Name	Age	Height	Weight
Alice	13	56.5	84
Barbara	13	65.3	98
Carol	14	62.8	102.5
Jane	12	59.8	84.5
Janet	15	62.5	112.5
Joyce	11	51.3	50.5
Judy	14	64.3	90
Louise	12	56.3	77
Mary	15	66.5	112

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Ex. 5 – Style Overrides – Name & Age

1. Go to SAS
2. File > Open Program > **Exercise5.sas**
3. Follow TO DO instructions
4. Go to Excel
5. File > \HOWDeIGobbo\MyWorkbook.xml
- or -
MyWorkbook.xml (from the recent file list)
6. Close the document (child) window (leave Excel running, but minimize it)

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Change/Add Style Elements/Attributes

```
style data_male from data /  
  background=#99ccff;
```

```
style data_female from data /  
  background=#ff99cc;
```

```
style data_male_d1 from data_male /  
  tagattr='format:#.0';
```

```
style data_female_d1 from data_female /  
  tagattr='format:#.0';
```

New style elements (**data_male_d1**,
data_female_d1) to add a new
attribute (**tagattr**)

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Use the New Elements – Height & Weight

```
ods tagsets.ExcelXP style=XLsansPrinter file= ... ;
* Other ODS statements here...

proc print data=sashelp.class noobs;
  where (sex eq 'M');
  var name age / style(Column)=data_male;
  var height weight /
  style(Column)=data_male_d1;
run; quit;

* Other ODS statement here...

proc print data=sashelp.class noobs;
  where (sex eq 'F');
  var name age / style(Column)=data_female;
  var height weight /
  style(Column)=data_female_d1;
run; quit;

ods tagsets.ExcelXP close;
```

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Use the New Elements

- Gender-appropriate background 😊
- 1 decimal place for Height and Weight
- Supported by PRINT, REPORT and TABULATE

Name	Age	Height	Weight
Alfred	14	69.0	112.5
Henry	14	63.5	102.5
James	12	57.3	83.0
Jeffrey	13	62.5	84.0
John	12	59.0	99.5
Philip	16	72.0	150.0
Robert	12	64.8	128.0
Ronald	15	67.0	133.0
Thomas	11	57.5	85.0
William	15	66.5	112.0

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

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More on Excel Formats – Formatting 1/10

Excel Format	Display Value
0.0	0.1
0.00	0.10
##	.1
###	.1

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Ex. 6 – Style Overrides – Height & Weight

1. Go to SAS
2. File > Open Program > **Exercise6.sas**
3. Follow TO DO instructions
4. Go to Excel
5. File > \HOWDeIGobbo\MyWorkbook.xml
- or -
MyWorkbook.xml (from the recent file list)
6. Close the document (child) window (leave Excel running, but minimize it)

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Conclusion

- Use ExcelXP tagset to create XML file
- Resulting XML file can be viewed with Excel
- Make use of tagset options
- Apply ODS style overrides carefully
- Use Excel formats instead of SAS formats

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 **THE POWER TO KNOW.**

Resources

- Vince's ExcelXP Resources
www.sas.com/reg/gen/corp/867226?page=Resources
- "Reporting Procedure Styles Tip Sheet"
support.sas.com/rnd/base/ods/scratch/reporting-styles-tips.pdf
(Ignore wrapping in above URL)

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Contact Information

Please send questions, comments and feedback to:

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If your registered in-house or local SAS users group would like to request this presentation as your annual SAS presentation (as a seminar, talk or workshop) at an upcoming meeting, please submit an online User Group Request Form (support.sas.com/usergroups/namerica/lug-form.html) at least eight weeks in advance.

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