An Overview of the ODS Destination for Excel

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THE POWER TO KNOW.

Starting in SAS 9.4 M3, the ODS Destination for Excel can be used to create XLSX files containing graphical and non-graphical SAS procedure output. This presentation highlights several old and new features of this destination.

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Agenda

- Highlight existing features
- Show some new features
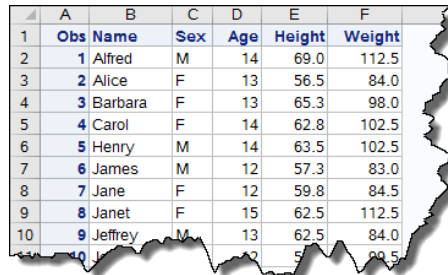
ODS Excel Destination Highlights

Basic Usage

```
ods Excel file='class.xlsx';
  proc print data=sashelp.class; run; quit;
ods Excel close;
```

	A	B	C	D	E	F
1	Obs	Name	Sex	Age	Height	Weight
2	1	Alfred	M	14	69.0	112.5
3	2	Alice	F	13	56.5	84.0
4	3	Barbara	F	13	65.3	98.0
5	4	Carol	F	14	62.8	102.5
6	5	Henry	M	14	63.5	102.5
7	6	James	M	12	57.3	83.0
8	7	Jane	F	12	59.8	84.5
9	8	Janet	F	15	62.5	112.5
10	9	Jeffrey	M	13	62.5	84.0

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Use the Excel ODS destination to create XLSX files for use with Microsoft Excel 2007 and later.

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Text and Graphics – In the Same Sheet

```
ods graphics on;

ods Excel file='univariate.xlsx'
  options(sheet_interval='none');

ods select BasicMeasures Histogram;

proc univariate data=sashelp.class;
  var age;
  histogram age / midpoints=11 to 16 by 1;
run; quit;

ods Excel close;
```
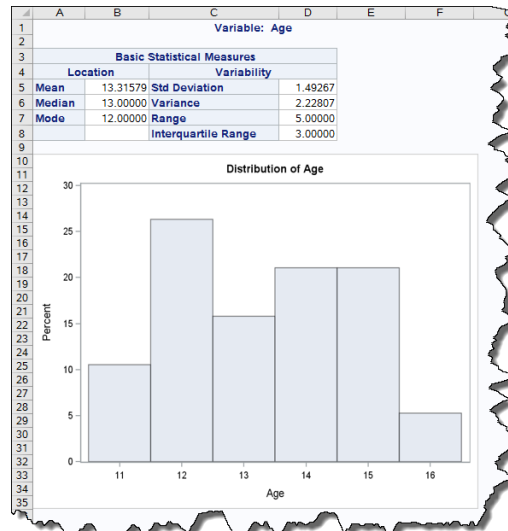
Excel destination options

Select ODS output to display

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The Excel destination creates a new worksheet for each tabular result and for each graphic object by default. This code produces two worksheets if no options are specified.

Use the SHEET_INTERVALoption to include all output in the same worksheet.

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Text and Graphics – In the Same Sheet

SAS Formats Translated to Excel Formats

```
data work.sample;
sex         = 'M';
pct         = 0.80;
zip         = 2421;
salary      = 123456;
num_comma   = 123456;
num_decimal = 123456.7;        User-defined format

format sex  $gender.  pct  percent8.2
       zip  z5.  salary  dollar11.2
       num_comma  comma8.  num_decimal  10.2;
run;
```

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The Excel destination automatically translates SAS formats to Excel formats, unlike the older tagsets.ExcelXP destination.

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SAS Formats Translated to Excel Formats

```
ods html file=... ;
ods Excel file=... ;
ods tagsets.ExcelXP file=... ;
  proc print data=work.sample noobs; run; quit;
ods _all_ close;
```

HTML

sex	pct	zip	salary	num_comma	num_decimal
Male	80.00%	02421	$123,456.00	123,456	123456.70

Excel

	A	B	C	D	E	F
1	sex	pct	zip	salary	num_comma	num_decimal
2	Male	80.00%	02421	$123,456.00	123,456	123456.70

ExcelXP

	A	B	C	D	E	F
1	sex	pct	zip	salary	num_comma	num_decimal
2	Male	80.00%	2421	$123,456.00	123456	123456.7

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The HTML destination supports all SAS formats, and is a good reference point. The Excel destination matches HTML in all cases, but the older tagsets.ExcelXP destination has differences.

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ODS Style Overrides – Change Style Attributes

- PROC PRINT syntax:

```
var myvar / style(location)=[attribute=value];
```

- PROC REPORT syntax:

```
define myvar / style(location)=[attribute=value];
```

- PROC statement syntax:

```
proc report data=... style(location)=[attribute=value];
```

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Style overrides are used to override style attributes, and make small changes to the appearance of your output.

Here is the general syntax for specifying style overrides.

The *location* specifies the location of the output that you want to change, such as HEADER for column headings, or COLUMN for data cells.

They are only supported by the PRINT, REPORT, and TABULATE procedures.

Overriding the Background Attribute

```
ods Excel file=... ;

  proc print data=sashelp.class;
    var name sex age;
    var height / style(column)=[background=papk];
    var weight / style(column)=[background=#ae82ed];
  run;

ods Excel close;
```

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These style overrides specify one background color for data cells of the HEIGHT column, and a different color for the WEIGHT column.

You can use SAS color names or RGB color names.

Overriding the Background Attribute

	A	B	C	D	E	F
1	Obs	Name	Sex	Age	Height	Weight
2	1	Alfred	M	14	69.0	112.5
3	2	Alice	F	13	56.5	84.0
4	3	Barbara	F	13	65.3	98.0
5	4	Carol	F	14	62.8	102.5
6	5	Henry	M	14	63.5	102.5
7	6	James	M	12	57.3	83.0
8	7	Jane	F	12	59.8	84.5
9	8	Janet	F	15	62.5	112.5
10	9	Jeffrey	M	13	62.5	84.0
11	10	John	M	12	59.0	99.5
12	11	Joyce	F	11	51.3	50.5
13	12	Judy	F	14	64.3	90.0
14	13	Louise	F	12	56.3	77.0
15	14	Mary	F	15	66.5	112.0
16	15	Philip	M	16	72.0	150.0
17	16	Robert	M	12	64.8	128.0
18	17	Ronald	M	15	67.0	133.0
19	18	Thomas	M	11	57.5	85.0
20	19	William	M	15	66.5	112.0

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Excel Number Formats – TAGATTR Attribute

```
data work.gainers_losers;
infile cards;
length ticker $4 change 8.;
input ticker change;
cards;
AA    -13.34
DM     23.44
EBAY  -10.12
GTLS   14.21
HUYA   -8.37
IQ     -9.2
SNA     9.5
TCP    27.29
;
run;
```

Display positive values
using green text,
negative in red text

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We would like to display the gainers in green text and the losers in red text. We
accomplish this using an Excel number format.

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Excel Number Formats – TAGATTR Attribute

```
ods Excel file=... ;

proc print data=work.gainers_losers noobs;
var ticker;
var change / style(column)=
  [tagattr='format:[green]#,##0.00;[red](#,##0.00)'];
run;

ods Excel close;
```

	A	B
1	ticker	change
2	AA	(13.34)
3	DM	23.44
4	EBAY	(10.12)
5	GTLS	14.21
6	HUYA	(8.37)
7	IQ	(9.20)
8	SNA	9.50
9	TCP	27.29

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Here is an example of using a style override to apply an Excel number format. Use the TAGATTR attribute with the FORMAT keyword to specify the format.

Microsoft Excel supports color coding in a number format, but it is limited to these 8 color values:

Black, Green, White, Blue, Magenta, Yellow, Cyan, Red

Excel Formulas – Use R1C1 Reference Style

Computed column

```
proc report data=sashelp.class;
  columns name sex age height weight bmi;

  define bmi / computed style(column)=
    [tagattr='formula:(RC[-1]/RC[-2]^2)*703'];
run; quit;
```

RC[-2]   RC[-1]

	A	B	C	D	E	F
1	Name	Sex	Age	Height	Weight	bmi
2	Alfred	M	14	69	112.5	17
3	Alice	F	13	56.5	84	18
4	Barbara	F	13	65.3	98	16
5	Carol	F	14	62.8	102.5	18
	Henry	M		.5	102.5	

No decimal places for BMI

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You can use style overrides to apply Excel formulas.

We use PROC REPORT to create a computed column with missing values.

Then w use the TAGATTR attribute with the FORMULA keyword to specify the Body Mass Index (BMI) formula:

```
BMI = (weight [lb.]  / height [in.] **2) * 703
```

The R1C1 reference style allows us to programmatically specify the correct cells for repeating rows.

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Excel Formula + Excel Number Format

```
proc report data=sashelp.class;
  columns name sex age height weight bmi;

  define bmi / computed style(column)=
    [tagattr='formula:(RC[-1]/RC[-2]^2)*703
             format:0.0'];
run; quit;
```

Excel Number Format

	A	B	C	D	E	F	G
1	Name	Sex	Age	Height	Weight	bmi	
2	Alfred	M	14	69	112.5	16.6	
3	Alice	F	13	56.5	84	18.5	
4	Barbara	F	13	65.3	98	16.2	
5	Carol	F	14	62.8	102.5	18.3	
6	Henry	M		62.5	102.5	17.9	

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Use the TAGATTR attribute to display the BMI values with one decimal place.

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ODS Excel Destination New *ish* Features

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Worksheet Tab Color

```
ods Excel file=... ;

ods Excel options(sheet_name='Female Students'
                  tab_color='papk');

proc print data=sashelp.class ... ; run; quit;

ods Excel options(sheet_name='Male Students'
                  tab_color='#83cbea');

proc print data=sashelp.class ... ; run; quit;

ods Excel close;
```

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The **Female Students** worksheet tab is pink and the **Male Students** tab is blue.

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Worksheet Tab Color

- **Female Students** tab selected
- **Male Students** tab selected
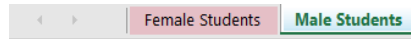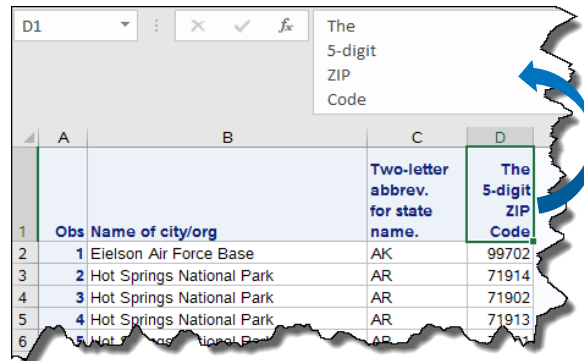
FLOW Option

- Problem: Long text sometimes contains embedded CRLF
- Excel cannot rewrap text when width is changed

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The Excel destination chooses column widths that best fit the data. Wrapping of data is controlled by adding CRLF characters at the appropriate location in the text string.

FLOW Option

```
ods Excel options(flow='headers');
```

The FLOW option prevents insertion of CRLF characters.

The column heading looks visually the same, but CRLF characters are not embedded in the value.

FLOW Option

Supported values:

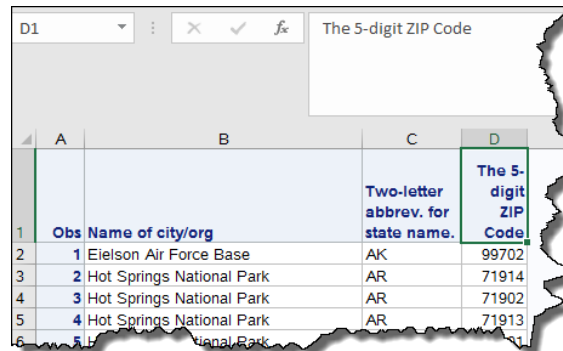| Value	Area Affected
Cell value or range	Cell (A12) or range (C1:E4)
DATA	Data cells
HEADERS	Column headers
ROWHEADERS	Row headers
TABLES	DATA, HEADERS, and ROWHEADERS
TEXT	Output from ODS TEXT and PROC ODSTEXT statements

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Unit of Measure for Height and Width

Previous output created using `flow='headers'` option:

Unit of Measure for Height and Width

SAS 9.4M4

```
ods Excel options(flow='headers'
                  absolute_column_width='0,0,0,15');
```

15 what?

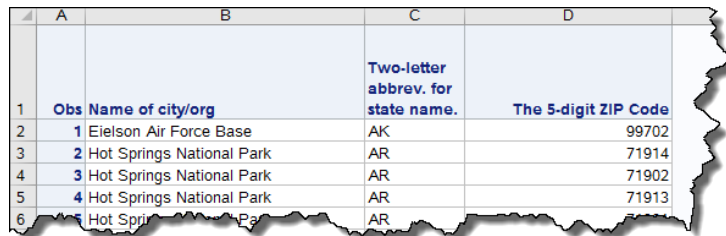|	A	B	C	D	
			Two-letter abbrev. for state name.	The 5-digit ZIP Code	
1	Obs	Name of city/org			
2	1	Eielson Air Force Base	AK	99702	
3	2	Hot Springs National Park	AR	71914	
4	3	Hot Springs National Park	AR	71902	
5	4	Hot Springs National Park	AR	71913	
6	5	Springs National Park		71901	

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Note how Column D heading text flowed due to the FLOW and ABSOLUTE_COLUMN_WIDTH options.

Use zero (0) to specify that the Excel ODS destination computes the column width.

Unit of Measure for Height and Width

```
ods Excel options(flow='headers'
                  absolute_column_width='0,0,0,4.5cm');
```

cm
em
ex
in
mm
pt
px

| ▲	A	B	C	D	
1	Obs	Name of city/org	Two-letter abbrev. for state name.	The 5-digit ZIP Code	
2	1	Eielson Air Force Base	AK	99702	
3	2	Hot Springs National Park	AR	71914	
4	3	Hot Springs National Park	AR	71902	
5	4	Hot Springs National Park	AR	71913	
6	5	Hot Spri... Pa	AR		

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We avoid wrapping in the Column D heading text by specifying 4.5 cm for the width.

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Protecting Worksheets

```
ods Excel options(protect_worksheet='on');
```

Review > Protect
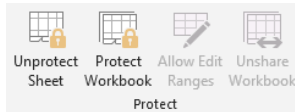
Password protection not supported

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You can protect a worksheet, but it can be unprotected because password protection is not supported.

This is useful to avoid accidental alteration of a worksheet.

Cell and Range Syntax

Option Name	Sample Values
START_AT	3,5 C5 (Coming in 9.4M6) ←
AUTOFILTER COLUMN_REPEAT HIDDEN_COLUMNS	3 3-5 C ← C:E
HIDDEN_ROWS ROW_REPEAT	3 3-5 3:5 ←
PRINT_AREA	C,1,E,10 C1:E10 ←

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Arrows indicate syntax supported in SAS 9.4M4 and later.

Resources

- Documentation

tinyurl.com/y882pxgg

- My papers

www.sas.com/reg/gen/corp/867226?page=Resources

Contact Information

Please send questions, comments and feedback to:

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About the author:

Vince DelGobbo is a Senior Software Developer in the Platform Research and Development division at SAS. This group's responsibilities include the SAS/IntrNet Application Dispatcher and SAS Stored Processes. He is involved in the development of new Web- and server-based technologies, bringing 3rd-party metadata into SAS, and integrating SAS output with Microsoft Office. He was also involved in the early development of the ExcelXP ODS tagset. Vince has been a SAS Software user since 1982, and joined SAS in 1992.

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User Group Request Form

http://goo.gl/yNCxeT

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