



What's New in SAS 9.3?



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Agenda



- ▶ SAS releases since SAS 9.1.3
- ▶ What's new - overview
- ▶ Changes to the default output
- ▶ Summary of updated procedures
- ▶ Additional changes
- ▶ New SAS macro features
- ▶ ODS graphics
- ▶ Enterprise Guide 4.3

SAS releases since SAS 9.1.3



SAS 9.1.3 → SAS 9.2:

Significant changes and enhancements. This was a major upgrade.

SAS 9.2 → SAS 9.3:

Building on the upgrades to SAS 9.2, while not a major update, it is still a significant upgrade in its own right.

What's new in SAS 9.3:

Most attention given to new features in SAS 9.3, in some cases it is also relevant to highlight changes since SAS 9.1.3.



What's new - overview

- ▶ Changes to the default output behaviour – all output now in HTML
- ▶ SAS / GRAPH license no longer required for ODS graphics
- ▶ Enhancements and fixes to numerous PROCs
- ▶ More facilities in SAS Macro
- ▶ New system options

Changes to the default output



	Previous Default	New Default in SAS 9.3
Output Destination	LISTING	HTML
Default style for HTML destination	Styles.Default	Styles.HTMLBlue
ODS Graphics	OFF	ON
Where graphs are saved	Current SAS directory	SAS Work Library

Advantages:

1. Graphs are integrated with tables
2. All output displayed in the same HTML file
3. New style for optimum presentation

Changes to the default output



Systolic Blood Pressure

The UNIVARIATE Procedure
Variable: Systolic

Moments			
N	22	Sum Weights	22
Mean	121.272727	Sum Observations	2668
Std Deviation	14.283463	Variance	204.017316
Skewness	1.12787257	Kurtosis	3.39471271
Uncorrected SS	327840	Corrected SS	4284.36364
Coeff Variation	11.777968	Std Error Mean	3.04524455

Basic Statistical Measures			
Location		Variability	
Mean	121.2727	Std Deviation	14.28346
Median	120.0000	Variance	204.01732
Mode	120.0000	Range	69.00000
		Interquartile Range	13.00000

Summary of updated procedures



PROC CIMPORT PROC GPLOT PROC REPORT

PROC CORR PROC OPTIONS PROC SORT

PROC CPORT PROC PRINT PROC SQL

PROC FCMP PROC PRINTTO PROC TABULATE

PROC FORMAT PROC RANK PROC UNIVARIATE

PROC FREQ PROC REGISTRY

Summary of updated procedures



PROC CPORT and PROC CIMPORT

The following enhancements have been made to CPORT and CIMPORT:

- ▶ The SELECT and EXCLUDE statements now support case sensitive names for files and catalogs.
- ▶ Support SAS name literals that include embedded blanks.
- ▶ When VALIDVARNAME=ANY or VALIDMEMNAME=EXTEND are specified, the data set / member names can be up to 32 bytes in length and also mixed case.

Summary of updated procedures



PROC SORT

The following options have been added to the SORT procedure:

NOUNIQUEKEY	eliminates observations that have a unique sort key.
NOUNIQUEREC	eliminates observations that are adjacently unique.
UNIQUEOUT=dataset	specifies the output data set for eliminated observations.

Summary of updated procedures



PROC FORMAT

The following enhancements have been made to the FORMAT procedure:

- ▶ Use the VALUE= statement to create a format that performs a function on a value.
- ▶ You can now use SAS Explorer to view format and informat definitions.

Summary of updated procedures



PROC FORMAT – User function

```
PROC FCMP outlib=work.functions.smd;  
  function ctof(c) $;  
    return(cats(((9*c)/5)+32,'F'));  
endsub;  
run;
```

```
options cmplib=(work.functions);
```

```
PROC FORMAT;  
  value ctof (default=10) other=[ctof()];  
run;
```

```
data _null_;  
  c=100;  
  put c=ctof.;  
Run;
```

```
20 data _null_;  
21   c=100;  
22   put c=ctof.;  
23 run;  
  
c=212F  
NOTE: DATA statement used (Total process time):  
      real time           0.09 seconds  
      cpu time            0.04 seconds
```

The SAS System

FORMAT NAME: CTOF LENGTH: 6 NUMBER OF VALUES: 1		
MIN LENGTH: 1 MAX LENGTH: 40 DEFAULT LENGTH: 10 FUZZ: STD		
START	END	LABEL (VER. V7 V8 14DEC2011:11:38:04)
OTHER	**OTHER**	[CTOF()]

Summary of updated procedures



The GPLOT Procedure

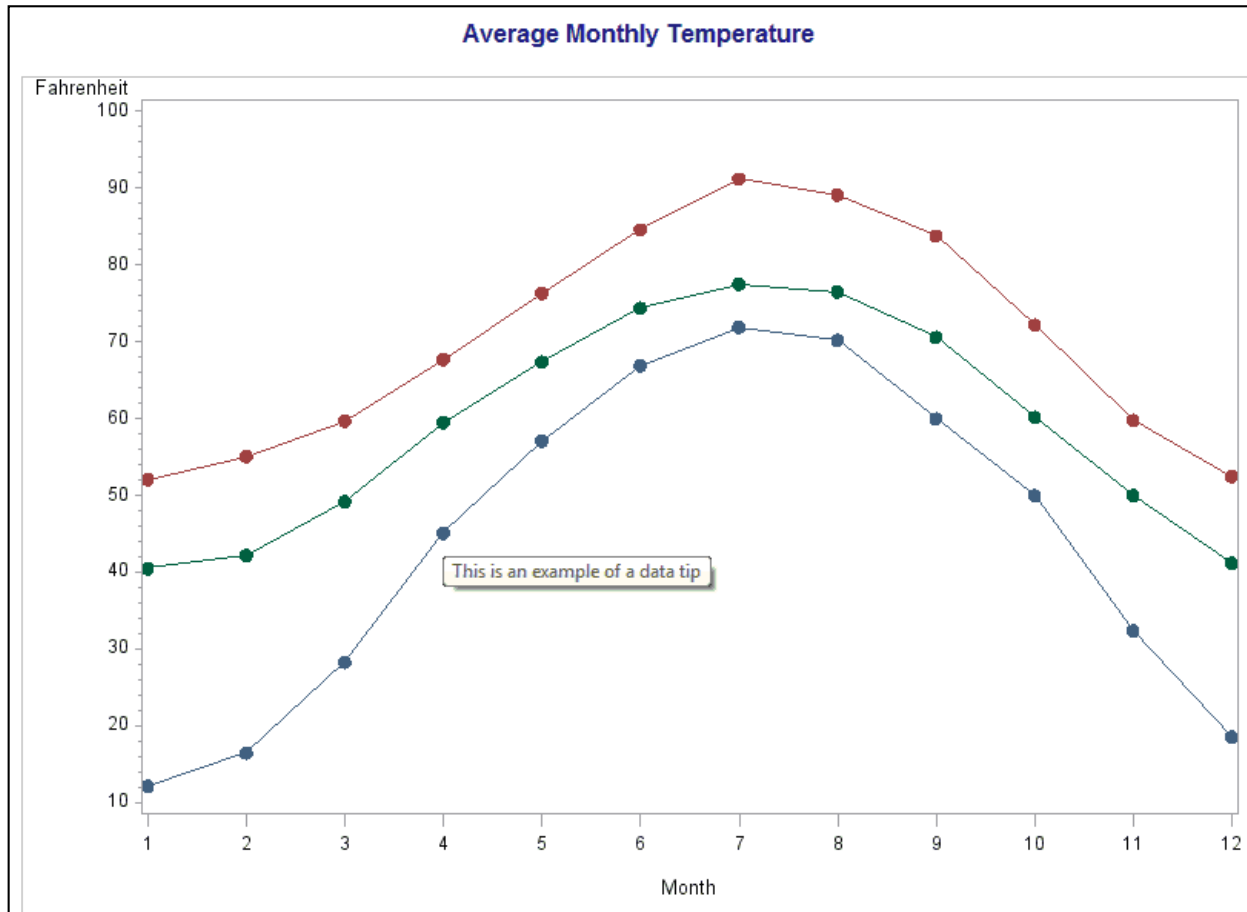
The GPLOT procedure has the following changes and enhancements:

- ▶ The HTML= option enables you to identify the variable in a bubble plot data set whose value creates a link to an HTML file generated by ODS.
- ▶ The new URL= option is available in the PLOT statement. This option enables you to specify a variable whose values are the URLs of Web pages to be displayed when the user clicks on elements in the graph.

Summary of updated procedures



The GPLOT Procedure



Month	Fahrenheit
1	52.1

Month	Fahrenheit
1	40.5

Month	Fahrenheit
1	12.2
2	16.5
3	28.3
4	45.1
5	57.1
6	66.9
7	71.9
8	70.2
9	60
10	50
11	32.4
12	18.6

Additional changes



Create new directories with the libname statement

```
Options DLCREATEDIR;
```

```
libname newdir 'c:\temp\newdir';
```

```
21  options DLCREATEDIR;
22
23  libname newdir 'c:\temp\newdir';
NOTE: Library NEWDIR was created.
NOTE: Libref NEWDIR was successfully assigned as follows:
      Engine:      V9
      Physical Name: c:\temp\newdir
```

```
libname mltidir 'c:\temp\lev1\lev2';
```

X

```
libname mltidir1 'c:\temp\lev1';
```

```
libname mltidir2 'c:\temp\lev1\lev2';
```

✓

Additional changes



Auditing of SAS libraries - Logging facility

Introduced in SAS 9.2, now also allows for audit of SAS libraries.

You can obtain the following information about a SAS library:

- ▶ the libref
- ▶ the engine associated with the library
- ▶ the library member name
- ▶ the library member type, such as catalog or data set
- ▶ the mode that the library was opened for: INPUT, OUTPUT, UPDATE
- ▶ the path to the library or to a database table

Additional changes



Resetting the line number in the SAS log

Simply add the following statement in between datasteps and procedures: **resetline;**

```
1 data test;  
2 testvar=1;  
3 run;  
  
NOTE: The data set WORK.TEST has 1 observations and 1 variables.  
NOTE: DATA statement used (Total process time):  
      real time          0.03 seconds  
      cpu time           0.03 seconds  
  
4  
5 resetline;  
6  
7 data test2;  
8 set test;  
9 run;  
  
NOTE: There were 1 observations read from the data set WORK.TEST.  
NOTE: The data set WORK.TEST2 has 1 observations and 1 variables.  
NOTE: DATA statement used (Total process time):  
      real time          0.01 seconds  
      cpu time           0.01 seconds
```

New SAS macro features



New automatic macro variable:

- ▶ **SYSNOBS** contains the number of observations read from the last data set that was closed by the previous step.

New macro functions:

- ▶ **%SYSMACEXEC** indicates whether a macro is currently executing.
- ▶ **%SYSMACEXIST** indicates whether there is a macro definition in the work.sasmacr catalogue.
- ▶ **%SYSMECDEPTH** returns the depth of nesting from the point of call.
- ▶ **%SYSMECNAME** returns the name of the macro executing at a nesting level.

New macro system option:

- ▶ **MAUTOCOMPLOC** enables the display of the source location of autocall macros in the SAS log.

ODS Graphics



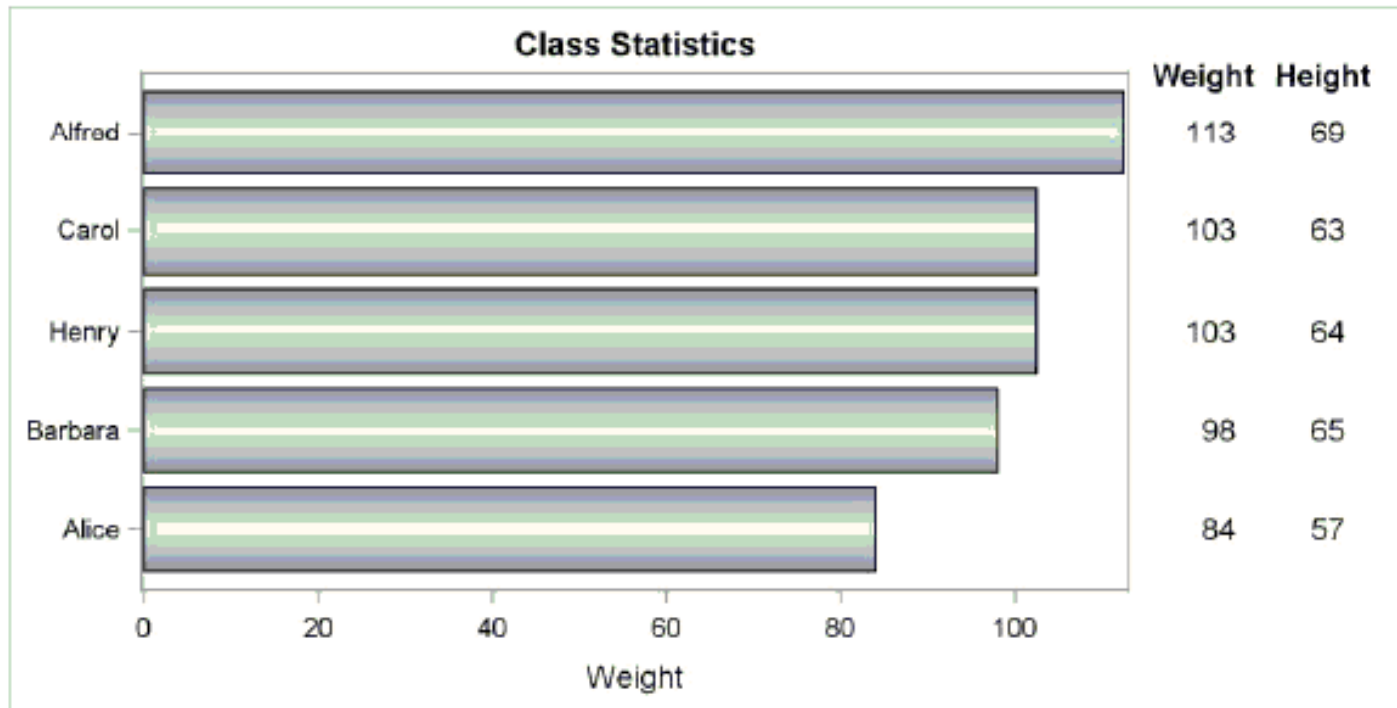
Statistical graphics (SG) & Graph template language (GTL)

- ▶ First introduced in SAS 9.2
- ▶ New updates and enhancements for SAS 9.3
- ▶ Specifically designed for creating statistical graphics
- ▶ New PROCs: SGPLOT, SGSCATTER, SGPANEL
- ▶ GTL is the underlying language used for statistical graphics
- ▶ Users can write their own GTL templates for powerful and flexible graphs

ODS Graphics



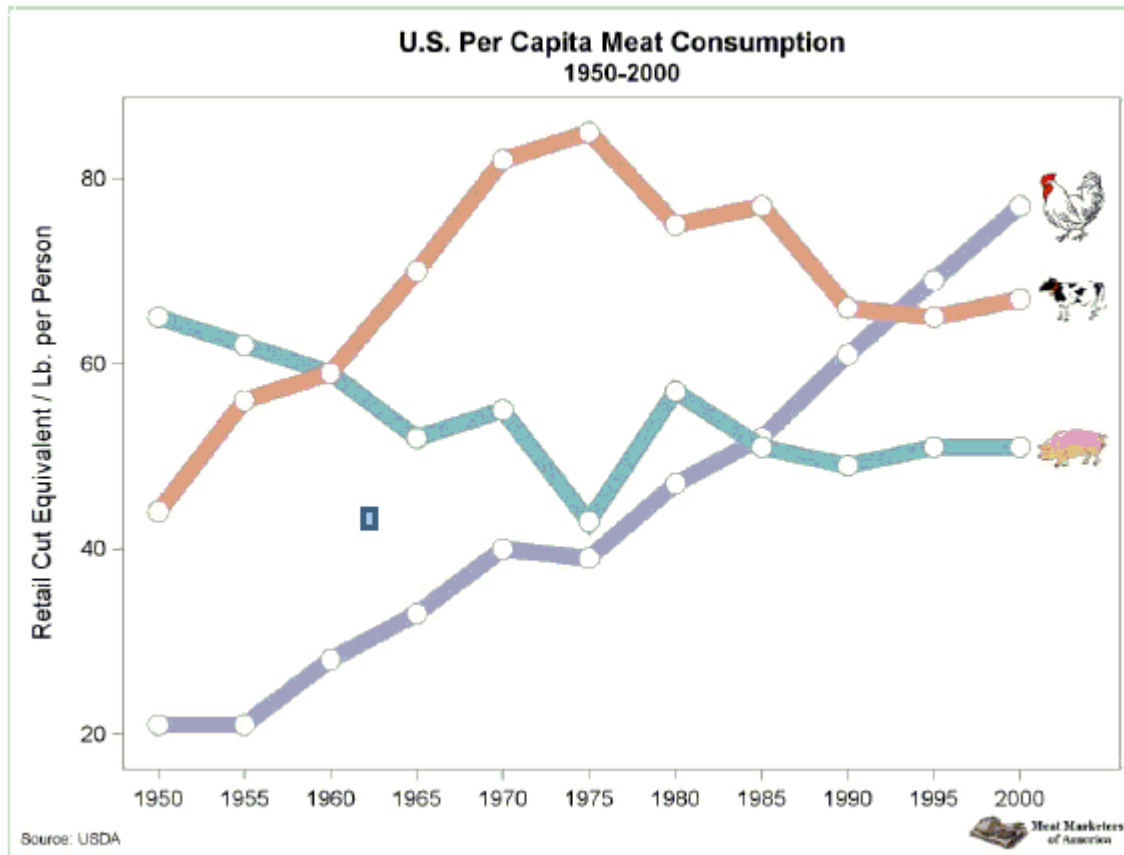
New annotation feature (pre-production)



ODS Graphics



New annotation feature (pre-production)



ODS Graphics



SCALABLE VECTOR GRAPHICS (SVG)

- ▶ The HTML, PDF, PCL and LISTING destinations from ODS now support Scalable Vector Graphics.
- ▶ SVG files can be zoomed in and out without losing any detail.
- ▶ Not possible with jpeg and gif files, these are one size only.

```
goptions reset=all device=svg;
```

```
ods html file="svgtest.htm";
```

```
data hat;
```

```
  do x=-5 to 5 by .25;
```

```
    do y=-5 to 5 by .25;
```

```
      z=sin(sqrt(x*x+y*y));
```

```
      output;
```

```
    end;
```

```
  end;
```

```
run;
```

```
proc g3d data=hat;
```

```
  plot y*x=z/ctop=red;
```

```
run;
```

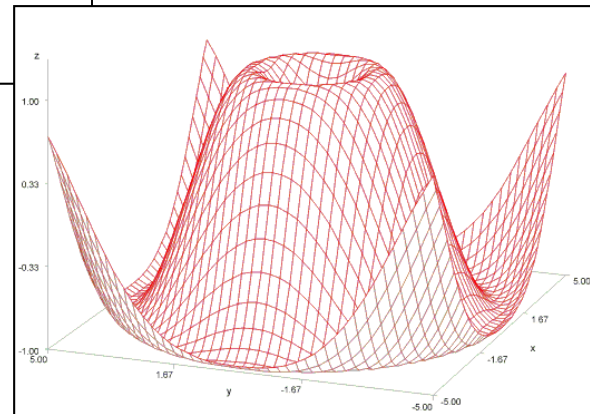
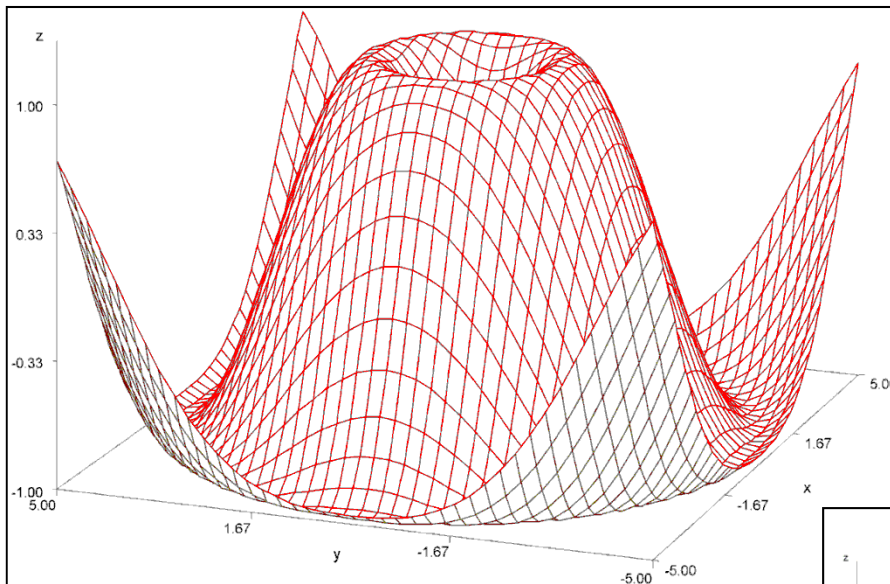
```
quit;
```

```
ods html close;
```

ODS Graphics



SCALABLE VECTOR GRAPHICS (SVG)



Enterprise Guide 4.3



- ▶ EG 4.3 first introduced with SAS 9.2
- ▶ SAS 9.3 only compatible with EG 4.3 (and more recently 5.1)
- ▶ New program editor with autocomplete and integrated syntax help
- ▶ Ability to analyse SAS programs

REFERENCES



OCS Documentation:

- ▶ What's New in SAS 9.2
- ▶ What's New in SAS 9.3

SAS Institute Documentation

- ▶ What's New in SAS 9.2
<http://support.sas.com/documentation/cdl/en/whatsnew/62580/PDF/default/whatsnew.pdf>
- ▶ What's New in SAS 9.3
<http://support.sas.com/documentation/cdl/en/whatsnew/64209/PDF/default/whatsnew.pdf>
- ▶ Now You Can Annotate Your Statistical Graphics Procedure Graphs - Dan Heath
<http://support.sas.com/resources/papers/proceedings11/277-2011.pdf>