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Exchanging Data Between SAS® and Excel: Basic SAS Techniques

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Course Objectives

Attendees will learn different methods of transferring data between SAS and Excel.

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DISCLAIMER

This is a survey course that does not cover all data transfer methods nor does the course completely cover any one topic.

The course is intended to open avenues of exploration to the student by identifying starting points.

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METHODS

- **CSV File Transfers (using FILENAME options)**
- **SAS Display Manager Features**
- **PROC IMPORT / EXPORT Routines**
- **LIBNAME EXCEL engine options**
- **SAS Enterprise Guide® tools**
- **Using JMP to Share Data with Excel**
- **SAS Add-In for Microsoft Office**
- **Output Delivery System Output Methods**

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Course Schedule

Topic	Time
SAS to Excel Overview	10 min
Exploring Older Transfer Methods (CSV,TAB)	15 min
Creating Excel Output with the Display Manager	15 min
PROC IMPORT and PROC EXPORT	30 min
Examining the EXCEL LIBNAME Engine	30 min
Break	20 min
SAS Enterprise Guide tools	20 min
Using JMP to Share Data with Excel	10 min
SAS Add-In for Microsoft Office	10 min
Overview of ODS Methods	30 min
ODS Destination EXCEL Methods and Options	30 min
Q&A (during the class or at the end)	20 min

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Course Datasets

First data source:

SASHelp.shoes

Second data source:

http://support.sas.com/publishing/authors/benjamin.html

Login and download the zip file 64107_example.zip Then see the Example Code and Data file in Chapter 4 called Data_for_DATE_file.txt

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SAS To Excel Overview

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- Oldest Transfer methods
  - Manual entering data
  - Text file transfers (CSV, TAB, TXT)
- First Automated transfers
  - Display Manager
  - Proc Export / Proc Import
- SAS/Access for PC Files
  - LIBNAME
  - SAS Enterprise Guide

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- SAS JMP
- SAS ADD-In for Microsoft Office
- SAS ODS Methods
  - Destinations (CSV, TAB, TXT, etc)
  - Tagsets (CSV, MSOFFICE2K (an HTML Process), EXCELXP)
  - New EXCEL ODS Destination
- SAS ODS EXCEL Destination Methods and Options

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Exploring Older Transfer Methods (CSV,TAB)

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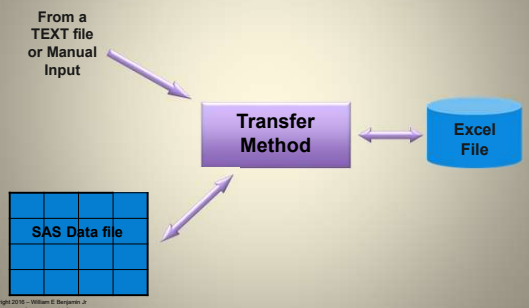
Older Transfer methods



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Older Transfer methods

- Comma Separated Value text files (*.csv)
- Tab Separated Value text files (*.tab, *.txt)
- Hypertext Markup Language text files (*.Html)

Older Transfer methods

Typical CSV Files Layout

Region,Product,Subsidiary,Stores,Sales,Inventory,Returns
Africa,Boot,Addis Ababa,12,"$29,761","$191,821",$769
Africa,Men's Casual,Addis Ababa,4,"$67,242","$118,036","$2,284"
Africa,Men's Dress,Addis Ababa,7,"$76,793","$136,273","$2,433"
Africa,Sandal,Addis Ababa,10,"$62,819","$204,284","$1,861"
Africa,Slipper,Addis Ababa,14,"$68,641","$279,795","$1,771"
Africa,Sport Shoe,Addis Ababa,4,"$1,690","$16,634",$79
Africa,Women's Casual,Addis Ababa,2,"$51,541","$98,641",$940

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Creating Excel Output with the Display Manager

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First Automated transfers

- Data and results can be sent to Excel spreadsheets
  - Using the SAS Display Manager (with a right-click – PC Windows)
  - Using the SAS EXPORT wizard
- Data can be read from Excel spreadsheets
  - Using the SAS Display Manager (with a right-click – PC Windows)
  - Using the SAS IMPORT wizard

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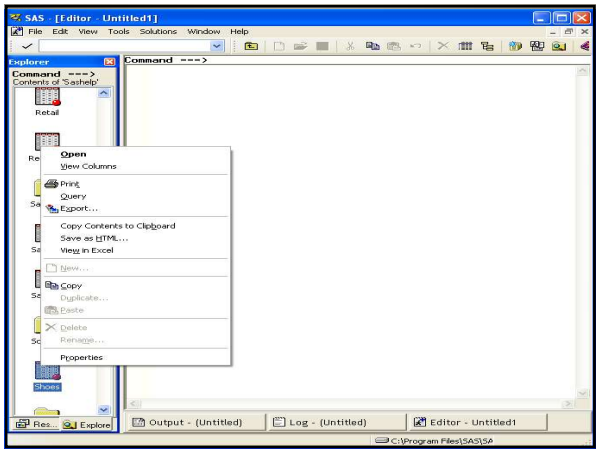

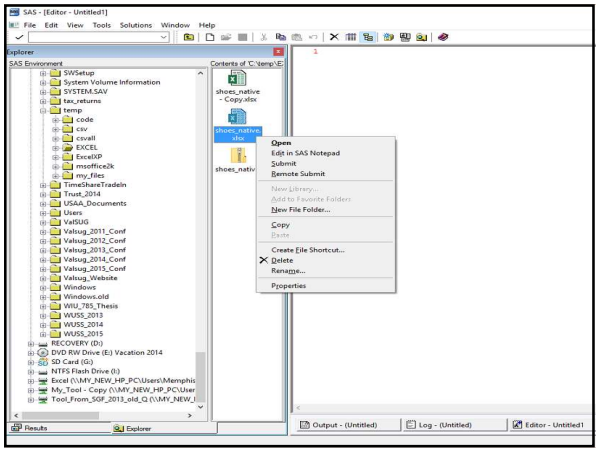

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Enhanced Transfer Methods

SAS/Access for PC Files

- With a license to SAS/ACCESS software for PC formats
  - Data sets can be exported in an Excel readable format
  - Using the EXPORT procedure DBMS options
  - Subsets of observations can also be exported to Excel
- Data and results can be sent to Excel spreadsheets
  - Using the EXPORT procedure
  - Using the LIBNAME engine
  - Using Output Delivery System (ODS)
    - ✓PROC steps
    - ✓DATA steps
  - With the SAS Display Manager (a right-click – PC Windows)

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PROC IMPORT and PROC EXPORT

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PROC EXPORT

PROC EXPORT Features

- Reads data from a SAS data set and writes it to an external data source
- Various external data sources include:
  - Microsoft Access database files
  - Microsoft Excel workbook files
  - Lotus 1-2-3 spreadsheet files
  - Paradox files
  - SPSS files
  - Stata files
  - dBase files
  - JMP files
  - delimited files

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PROC EXPORT Syntax

The SAS 9 syntax used to create Excel spreadsheets follows:

```
PROC EXPORT DATA=<libref.>SAS-data-set
            OUTFILE="filename"
            <DBMS=identifier> <REPLACE>;
```

where SAS-data-set represents the name of an input data set, OUTFILE="filename" represents the complete pathname and filename for the spreadsheet, DBMS=identifier represents the type of data to export (see following table), and REPLACE indicates overwriting the existing spreadsheet.

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DBMS= Identifier Values

When DBMS Identifier =	SAS/ACCESS Interface to PC Files Required	General description of the DBMS output file
CSV	N	Text file with a comma delimiter
TAB	N	Text file with a tab delimiter
DLM	N	Text file with a user defined delimiter
EXCEL	Y	Excel Workbook referenced by a LIBNAME
EXCELCS	Y	Excel Workbook referenced by using the SAS PCFILES SERVER
EXCEL4	Y	Excel Workbook
EXCEL5	Y	Excel Workbook
XLS	Y	Excel Workbook using file formats prior to Excel 2007 except EXCEL4 and EXCEL5
XLSX	Y	Excel Workbook using file formats 2007, 2010, and 2013

DBMS= Identifier Values

DBMS Identifier =	Method of accessing Excel Files	Excel Version	Comments
EXCEL	LIBNAME statement	5, 95, 97, 2000, 2002, 2003, 2007, 2010, 2013	This DBMS option will use the LIBNAME. Access may be limited to the first 255 columns. Some older versions may be limited to 65,535 rows.
EXCELCS	SAS PC Files Server	5, 95, 97, 2000, 2002, 2003, 2007, 2010, 2013	This DBMS option will use the SAS PC Files Server. Access may be limited to the first 255 columns. Some older versions may be limited to 65,535 rows.
EXCEL4 or EXCEL5	DBLOAD procedure	4, 5, 95	This is supported only on Microsoft Windows operating systems and is for SAS Version 6 compatibility
XLS	XLS format	97, 2000, 2002, 2003	Chinese, Japanese, or Korean DBCS character sets may not be supported in all versions of SAS.
XLSX	XLSX format	2007, 2010, 2013, and later formats	Chinese, Japanese, or Korean DBCS character sets are not be supported in some versions of SAS or *.xlsb Excel files.

PROC EXPORT Example #1

Creating an Excel spreadsheet is easy with PROC EXPORT. To create an Excel 2007-2013 spreadsheet from the data in SASHELP.Shoes, specify the following statement and options:

```
%let path = I:\2016 Conferences\MWSUG_2016\Class_1;
PROC EXPORT DATA=SASHELP.Shoes
  OUTFILE="&path.\out\Exercise_1.xlsx"
  DBMS=xlsx
  REPLACE;
RUN;
```

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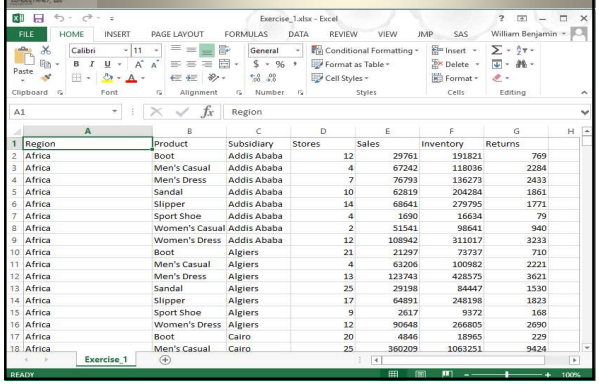
PROC EXPORT Example #1



	A	B	C	D	E	F	G
1	Region	Product	Subsidiary	Stores	Sales	Inventory	Returns
2	Africa	Boot	Addis Ababa	12	29761	191821	769
3	Africa	Men's Casual	Addis Ababa	4	67242	118036	2284
4	Africa	Men's Dress	Addis Ababa	7	76793	136273	2433
5	Africa	Sandal	Addis Ababa	10	62819	204284	1861
6	Africa	Slipper	Addis Ababa	14	68641	279795	1771
7	Africa	Sport Shoe	Addis Ababa	4	1690	16634	79
8	Africa	Women's Casual	Addis Ababa	2	51541	98641	940
9	Africa	Women's Dress	Addis Ababa	12	108942	311017	3233
10	Africa	Boot	Algiers	21	21297	73737	710
11	Africa	Men's Casual	Algiers	4	63206	100982	2221
12	Africa	Men's Dress	Algiers	13	123743	428575	3621
13	Africa	Sandal	Algiers	25	29198	84447	1530
14	Africa	Slipper	Algiers	17	64891	248198	1823
15	Africa	Sport Shoe	Algiers	9	2617	9372	168
16	Africa	Women's Dress	Algiers	12	90648	266805	2690
17	Africa	Boot	Cairo	20	4846	18965	229
18	Africa	Men's Casual	Cairo	25	360209	1063251	9424

PROC EXPORT Example #2

This example illustrates the syntax used to create an Excel 97/2003 (*.xls) spreadsheet Using the PC File Server

```
%let path = I:\2016 Conferences\MWSUG_2016\Class_1;
PROC EXPORT DATA=SASHELP.Shoes
OUTFILE="&path./out/Exercise_2.xls"
DBMS=EXCELCS
REPLACE;
RUN;
```

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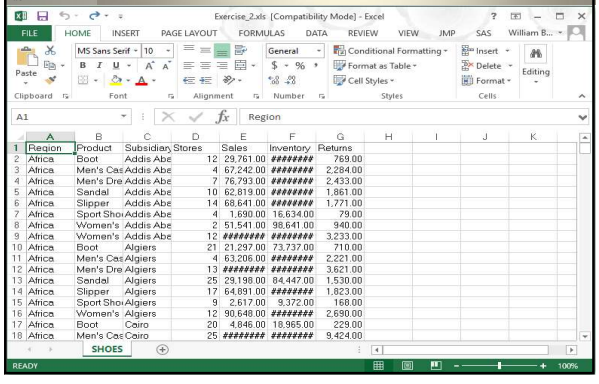
PROC EXPORT Example #2



	A	B	C	D	E	F	G
1	Region	Product	Subsidiary	Stores	Sales	Inventory	Returns
2	Africa	Boot	Addis Abe	12	29,761.00	########	769.00
3	Africa	Men's Cas	Addis Abe	4	67,242.00	########	2,284.00
4	Africa	Men's Dre	Addis Abe	7	76,793.00	########	2,433.00
5	Africa	Sandal	Addis Abe	10	62,819.00	########	1,861.00
6	Africa	Slipper	Addis Abe	14	68,641.00	########	1,771.00
7	Africa	Sport Sho	Addis Abe	4	1,690.00	16,634.00	79.00
8	Africa	Women's	Addis Abe	2	51,541.00	98,641.00	940.00
9	Africa	Women's	Addis Abe	12	########	########	3,233.00
10	Africa	Boot	Algiers	21	21,297.00	73,737.00	710.00
11	Africa	Men's Cas	Algiers	4	63,206.00	########	2,221.00
12	Africa	Men's Dre	Algiers	13	########	########	3,621.00
13	Africa	Sandal	Algiers	25	29,198.00	84,447.00	1,530.00
14	Africa	Slipper	Algiers	17	64,891.00	########	1,823.00
15	Africa	Sport Sho	Algiers	9	2,617.00	9,372.00	168.00
16	Africa	Women's	Algiers	12	90,648.00	########	2,690.00
17	Africa	Boot	Cairo	20	4,846.00	18,965.00	229.00
18	Africa	Men's Cas	Cairo	25	########	########	9,424.00

PROC EXPORT Example #3

Exporting a **subset** to an Excel spreadsheet is accomplished using PROC EXPORT with a WHERE= data set option. For example, to export just the "Asia" region from the Shoes data set to an Excel 2007/2013 spreadsheet, specify the following PROC EXPORT statement and WHERE= data set option:

```
%let path = I:\2016 Conferences\MWSUG_2016\Class_1;
PROC EXPORT DATA=SASHELP.Shoes
            (WHERE=(region='Asia'))
           OUTFILE="&path.\out\Asia_products.xlsx"
              DBMS=XLSX;
    RUN;
```

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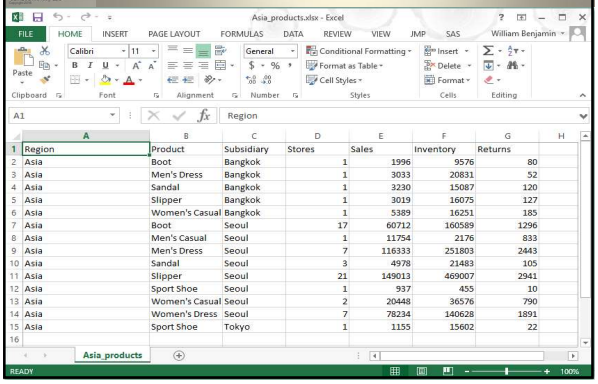
PROC EXPORT Example #3



Region	Product	Subsidiary	Stores	Sales	Inventory	Returns
Asia	Boot	Bangkok	1	1996	9576	80
Asia	Men's Dress	Bangkok	1	3033	20831	52
Asia	Sandal	Bangkok	1	3230	15087	120
Asia	Slipper	Bangkok	1	3019	16075	127
Asia	Women's Casual	Bangkok	1	5389	16251	185
Asia	Boot	Seoul	17	60712	160589	1296
Asia	Men's Casual	Seoul	1	11754	2176	833
Asia	Men's Dress	Seoul	7	116333	251803	2443
Asia	Sandal	Seoul	3	4978	21483	105
Asia	Slipper	Seoul	21	149013	469007	2941
Asia	Sport Shoe	Seoul	1	937	455	10
Asia	Women's Casual	Seoul	2	20448	36576	790
Asia	Women's Dress	Seoul	7	78234	140628	1891
Asia	Sport Shoe	Tokyo	1	1155	15602	22

PROC EXPORT Example #4

Exporting a SAS data set to a delimited file requires using the PROC EXPORT DBMS=DLM option and DELIMITER= data source statement. For example, to export the SASHELP.Shoes data set to a delimited file, specify the following PROC EXPORT statement and parameters:

```
%let path = I:\2016 Conferences\MWSUG_2016\Class_1;
PROC EXPORT DATA=SASHELP.Shoes
  OUTFILE="&path.\out\Shoes_delimited.txt"
  DBMS=DLM
  REPLACE;
  * insert any delimiter below  -
 This is optional, default = ',';
  DELIMITER='&';
RUN;
```

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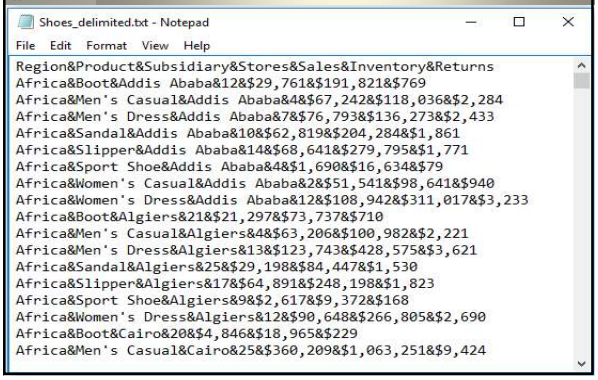
PROC EXPORT Example #4



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PROC IMPORT

PROC IMPORT Features

- Reads data from an external source file into a SAS data set
- Various external data sources include:
  - Microsoft Access database files
  - Microsoft Excel workbook files
  - Lotus 1-2-3 spreadsheet files
  - Paradox files
  - SPSS files
  - Stata files
  - dBase files
  - JMP files
  - delimited files

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PROC IMPORT Syntax

The SAS 9 syntax used to create Excel spreadsheets follows:

PROC IMPORT
DATAFILE= <'*filename*'> | DATATABLE= <'*tablename*'> (Not used for Microsoft Excel files)
<DBMS>= <*data-source-identifier*>
<OUT>= <*libref.SAS data-set-name*> <*SAS data-set-option(s)*>
<REPLACE>;
***<file-format-specific-statements>*;**

where SAS-data-set represents the name of an input data set, OUTFILE="filename" represents the complete pathname and filename for the spreadsheet, DBMS=identifier represents the type of data to export (see following table), and REPLACE indicates overwriting the existing spreadsheet.

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DBMS= Identifier Values

When DBMS Identifier =	SAS/ACCESS Interface to PC Files Required	General description of the DBMS output file
CSV	N	Text file with a comma delimiter
TAB	N	Text file with a tab delimiter
DLM	N	Text file with a user defined delimiter
EXCEL	Y	Excel Workbook referenced by a LIBNAME
EXCELCS	Y	Excel Workbook referenced by using the SAS PCFILES SERVER
EXCEL4	Y	Excel Workbook
EXCEL5	Y	Excel Workbook
XLS	Y	Excel Workbook using file formats prior to Excel 2007 except EXCEL4 and EXCEL5
XLSX	Y	Excel Workbook using file formats 2007, 2010, and 2013

DBMS= Identifier Values

DBMS Identifier =	Method of accessing Excel Files	Excel Version	Comments
EXCEL	LIBNAME statement	5, 95, 97, 2000, 2002, 2003, 2007, 2010, 2013	This DBMS option will use the LIBNAME. Access is limited to the first 255 columns. Some older versions may be limited to 65,535 rows.
EXCELCS	SAS PC Files Server	5, 95, 97, 2000, 2002, 2003, 2007, 2010, 2013	This DBMS option will use the SAS PC Files Server. Access is limited to the first 255 columns. Some older versions may be limited to 65,535 rows.
EXCEL4 or EXCEL5	DBLOAD procedure	4, 5, 95	This is supported only on Microsoft Windows operating systems and is for SAS Version 6 compatibility
XLS	XLS format	97, 2000, 2002, 2003	Chinese, Japanese, or Korean DBCS character sets may not be supported in all versions of SAS.
XLSX	XLSX format	2007, 2010, and later formats	This does not support the Chinese, Japanese, or Korean DBCS character sets may not be supported in all versions of SAS or *.xlsb Excel files.

PROC IMPORT Example #1

Creating a SAS dataset from an Excel spreadsheet is easy with PROC IMPORT. To create a SAS dataset from an Excel 2007-2013 spreadsheet, specify the following statement and options:

```
%let path = I:\2016 Conferences\MWSUG_2016\Class_1;
PROC IMPORT DATAFILE="&path.\out\Exercise_1.xlsx"
                    DBMS=XLSX
                      OUT=work.shoes_xlsx
                  REPLACE;
RUN;
```

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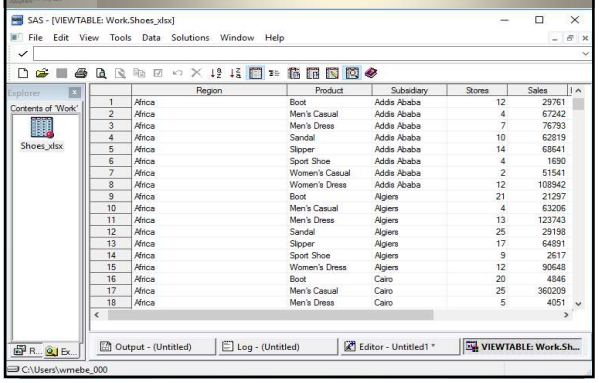
PROC IMPORT Example #1



PROC IMPORT Example #2

This example illustrates the syntax used to create an Excel 97/2003 (*.xls) spreadsheet Using the PC File Server

```
%let path = I:\2016 Conferences\MWSUG_2016\Class_1;
PROC IMPORT DATAFILE="&path.\out\Exercise_2.xls"
                    DBMS=EXCELCS
                      OUT=work.shoes_xls
                  REPLACE;
RUN;
```

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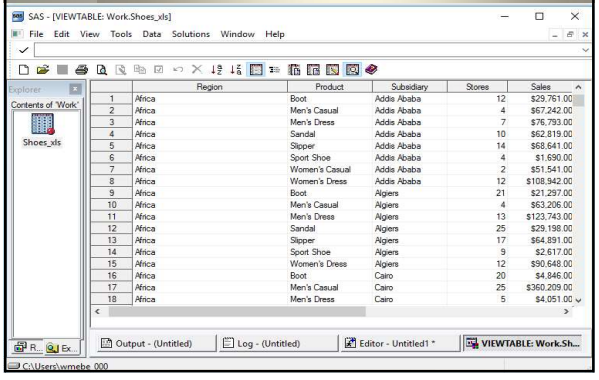
PROC IMPORT Example #2



PROC IMPORT Example #3

Importing a subset to an Excel spreadsheet is accomplished using PROC IMPORT with a WHERE= data set option. For example, to import just the "Asia" region from the Excel 2007/2013 spreadsheet to a SAS dataset, specify the following PROC IMPORT statement and WHERE= dataset option:

```
%let path = I:\2016 Conferences\MWSUG_2016\Class_1;

PROC IMPORT DATAFILE="&path.\out\Exercise_1.xlsx"
                OUT=work.shoes_asia
          (WHERE=(region='Asia'))
             DBMS=XLSX
         REPLACE;
    RUN;
```

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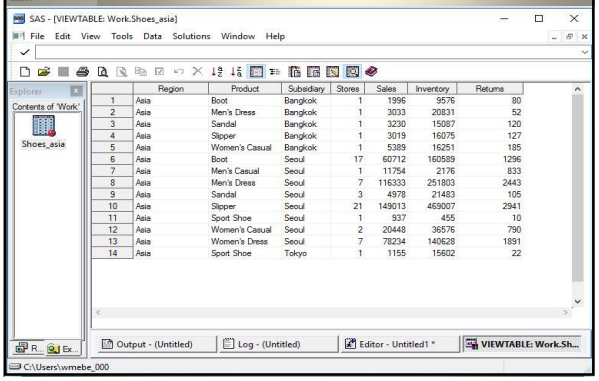
PROC IMPORT Example #3



	Region	Product	Subsidiary	Stores	Sales	Inventory	Returns
1	Asia	Boot	Bangkok	1	1996	9576	80
2	Asia	Men's Dress	Bangkok	1	3033	20831	52
3	Asia	Sandal	Bangkok	1	3230	15087	120
4	Asia	Slipper	Bangkok	1	3019	16075	127
5	Asia	Women's Casual	Bangkok	1	5389	16251	185
6	Asia	Boot	Seoul	17	60712	160589	1296
7	Asia	Men's Casual	Seoul	1	11754	2176	833
8	Asia	Men's Dress	Seoul	7	116333	251803	2443
9	Asia	Sandal	Seoul	3	4978	21483	105
10	Asia	Slipper	Seoul	21	149013	469007	2941
11	Asia	Sport Shoe	Seoul	1	937	455	10
12	Asia	Women's Casual	Seoul	2	20448	36576	790
13	Asia	Women's Dress	Seoul	7	78234	140628	1891
14	Asia	Sport Shoe	Tokyo	1	1155	15602	22

PROC IMPORT Example #4

Importing data to a SAS dataset from a delimited file requires using the PROC IMPORT DBMS=DLM option and DELIMITER= data source statement. For example, to import data from a delimited file, specify the following PROC IMPORT statement and parameters:

```
%let path = I:\2016 Conferences\MWSUG_2016\Class_1;

PROC IMPORT   DATAFILE="&path.\out\Shoes_delimited.txt"
                OUT=work.Shoes_delimited
             DBMS=DLM
          REPLACE;
       DELIMITER='&';
RUN;
```

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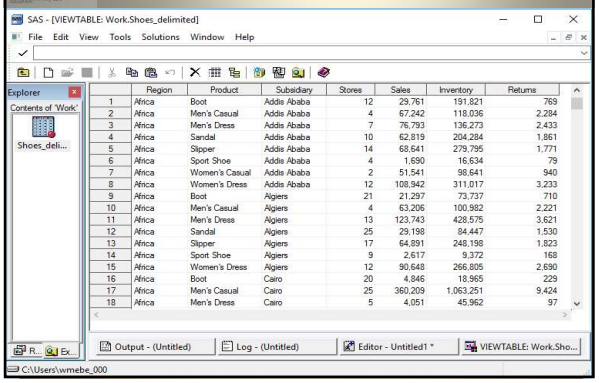
PROC IMPORT Example #4



	Region	Product	Subsidiary	Stores	Sales	Inventory	Returns
1	Africa	Boot	Addis Ababa	12	29,761	191,821	769
2	Africa	Men's Casual	Addis Ababa	4	67,242	118,036	2,284
3	Africa	Men's Dress	Addis Ababa	7	76,793	136,273	2,433
4	Africa	Sandal	Addis Ababa	10	62,819	204,284	1,861
5	Africa	Slipper	Addis Ababa	14	68,541	279,795	1,771
6	Africa	Sport Shoe	Addis Ababa	4	1,690	16,634	79
7	Africa	Women's Casual	Addis Ababa	2	51,541	98,641	940
8	Africa	Women's Dress	Addis Ababa	12	108,942	311,017	3,233
9	Africa	Boot	Algiers	21	21,297	73,737	710
10	Africa	Men's Casual	Algiers	4	63,206	100,982	2,221
11	Africa	Men's Dress	Algiers	13	123,743	428,575	3,621
12	Africa	Sandal	Algiers	25	29,198	84,447	1,530
13	Africa	Slipper	Algiers	17	64,891	248,198	1,823
14	Africa	Sport Shoe	Algiers	9	2,617	9,372	168
15	Africa	Women's Dress	Algiers	12	90,648	266,805	2,690
16	Africa	Boot	Cairo	20	4,846	18,965	229
17	Africa	Men's Casual	Cairo	25	360,209	1,063,251	9,424
18	Africa	Men's Dress	Cairo	5	4,051	45,962	97

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Examining the EXCEL LIBNAME Engine

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LIBNAME EXCEL Engine Syntax

The LIBNAME syntax used to create Excel files is:

```
LIBNAME libref <engine> <physical-file-name>
   <SAS/ACCESS-engine-connection-options>
   <SAS/ACCESS-libname-options>;
```

where libref represents the user-defined alias to reference a SAS dataset, engine is EXCEL for reading and writing to Excel workbooks, the physical-file-name is the fully qualified path and file name of the Excel file including the file extension (xls or xlsx), engine-connection and libname options modify the processing features.

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Engine Options

Option	Description
Excel	This Engine option is commonly used with versions of SAS after to V9.3 and may also be associated with the "PATH=" option for use on UNIX, LINUX, and Windows 64 bit OS systems.
PCFILES	This Engine option is commonly used with versions of SAS prior to V9.4 and is also associated with the "PATH=" option for use on UNIX, LINUX, and Windows 64 bit OS systems.

Note The conversion of Microsoft Excel files from the "XLS" format to the "XLSX" format and the general PC hardware conversion from publicly available 32-bit hardware/software to 64-bit hardware/software caused a lot of different changes both the SAS programs and the EXCEL programs. The PCFILES program was designed as a bridge between 32/64 bit systems.

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Connection Options

Option	Description
HEADER	Affects the way that the first row or observation is processed.
MIXED	Affects how columns with both numeric and character data are treated.
PATH	Allows you to supply a path for an Excel file, this is not always needed.
PROMPT	Allows the SAS system provide help menus to assist with assign LIBNAMEs.
VERSION	Assigns the output Excel version, SAS can determine the input version.

Selected LIBNAME Options

OPTION (default in bold type)	DESCRIPTION
ACCESS=READONLY	Limits SAS to a read only mode.
DBGEN_NAME=**DBMS** or SAS	Specify how data source columns are named.
DBMAX_TEXT=n (1-32767)	Maximum input string length (default **1024**).
DBSASLABEL=**COMPT** or NONE	Select to use input column names as a label.
FILELOCK=YES or **NO**	Specify if the input file is locked to other users..
SCAN_TEXTSIZE=**YES** or NO	Scan input character columns for size of strings.
SCAN_TIMETYPE=YES or **NO**	Scan Excel variables for time values.
STRINGDATES=YES OR **NO**	Select to read dates as character strings.
USEDATETYPE=**YES** or NO	Use the SAS format DATE9. For date values.

Dataset Options (common)

Option	Description
DROP	Exclude variables from being written or read to/from an input or output file.
FIRSTOBS	Specify the first record read from an input Excel file.
IN	Create a flag to indicate if a variable is from a specific input file.
KEEP	Include variables being written or read to/from an input or output file.
RENAME	Rename variables when either reading or writing a file
WHERE	Select observations for input or output based upon user defined conditions

Dataset Options (EXCEL)

Option	Description
DBCREATE_TABLE_OPTS	Appends SQL code to the CREATE TABLE command.
DBENCODING	Defines character set used in accessing the Excel file
DBFORCE	Forces insertion large character strings into the file.
DBGEN_NAME	Controls generation of SAS dataset variable names.
DBLABEL	Selects SAS labels or names as Excel column names.
DBMAX_TEXT	Defines the maximum length of a character variable.
DBSASLABEL	Selects Excel column names as SAS variable labels.
DBSASTYPE	Specifies a data type override for input Excel data.
DBTYPE	Specifies a data type override for output Excel data.
INSERT_SQL	Determines SQL insert method to add new rows.
READBUFF	Determine input buffer row count.
SASDATEFMT	Defines specific date formatting by column

Why Use These Options?

- More options than PROC IMPORT/EXPORT
- Convert data while doing input/output
  - Can convert dates
  - Can convert numeric to character
  - Can specify string lengths
  - Can control label and variable names
  - Can set read only mode for input
  - Read or Write from multiple sheets
  - Other features are available

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LIBNAME Example #1

Beginning in SAS 9, a LIBNAME statement can be used to export a data set to an Excel spreadsheet file. For example, to export the data in the SASHELP.Shoes data set to an Excel 97/2003 spreadsheet, specify the following LIBNAME statement:

```
LIBNAME MY_XLS PCFILES PATH='c:\temp\my_shoes.XLS';
  DATA MY_XLS.Sheet1;
    SET SASHELP.Shoes;
  RUN;
LIBNAME MY_XLS;  * release output file to use by Excel;
```

Requires SAS/Access to PC Files, and the SAS PC Files Server to be running

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LIBNAME Example #1 Log

```
6   LIBNAME MY_XLS PCFILES PATH='c:\temp\my_shoes.XLS';
NOTE: Libref MY_XLS was successfully assigned as follows:
      Engine:        PCFILES
      Physical Name: c:\temp\my_shoes.XLS
7     DATA MY_XLS.Sheet1;
8       SET SASHELP.Shoes;
9     RUN;

NOTE: SAS variable labels, formats, and lengths are not written to DBMS tables.
NOTE: There were 395 observations read from the data set SASHELP.SHOES.
NOTE: The data set MY_XLS.Sheet1 has 395 observations and 7 variables.
NOTE: DATA statement used (Total process time):
      real time           0.16 seconds
      cpu time            0.00 seconds

10  LIBNAME MY_XLS;
NOTE: Libref MY_XLS has been deassigned.
10 !                * release output file to use by Excel;
```

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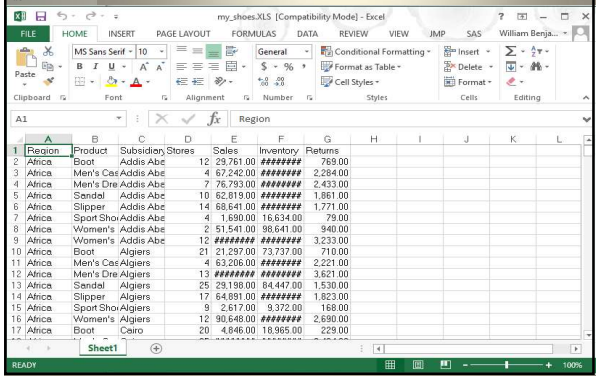
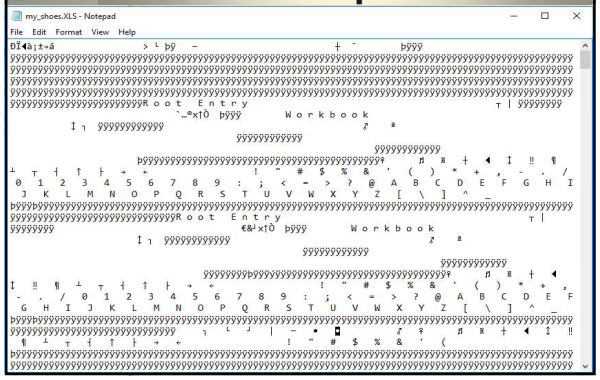
LIBNAME Example #1 xls



LIBNAME Example #1 Notepad



LIBNAME Example #2

This same example in SAS 9.4, a LIBNAME statement can be used to export a data set to an Excel spreadsheet file. For example, to export the data in the SASHELP.Shoes data set to an Excel 97/2003 spreadsheet, specify the following LIBNAME statement:

```
LIBNAME MY_XLS EXCEL PATH='c:\temp\my_shoes.XLS';
  DATA MY_XLS.Sheet2;
    SET SASHELP.Shoes;
  RUN;
LIBNAME my_xls;  * release output file to use by Excel;
```

Requires SAS/Access to PC Files, and the SAS PC Files Server to be running

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LIBNAME Example #2 Log

```
11  LIBNAME MY_XLS EXCEL PATH='c:\temp\my_shoes.XLS';
NOTE: Libref MY_XLS was successfully assigned as follows:
      Engine:        EXCEL
      Physical Name: c:\temp\my_shoes.XLS
12    DATA MY_XLS.Sheet2;
13      SET SASHELP.Shoes;
14    RUN;

NOTE: SAS variable labels, formats, and lengths are not written to DBMS tables.
NOTE: There were 395 observations read from the data set SASHELP.SHOES.
NOTE: The data set MY_XLS.Sheet2 has 395 observations and 7 variables.
NOTE: DATA statement used (Total process time):
      real time           0.03 seconds
      cpu time            0.03 seconds

15  LIBNAME my_xls;
NOTE: Libref MY_XLS has been deassigned.        * release output file to use by Excel;
```

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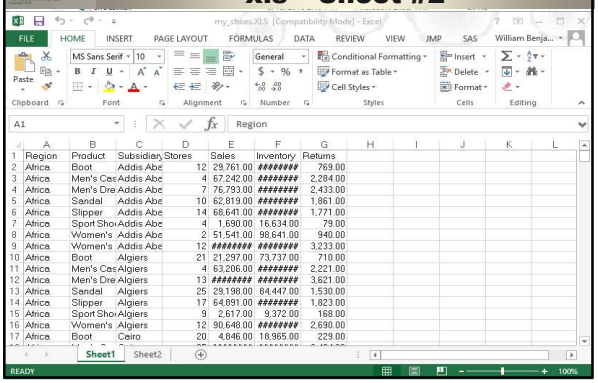
LIBNAME Example #2
xls – Sheet #2



	A	B	C	D	E	F	G	H	I	J	K	L
1	Region	Product	Subsidiary	Stores	Sales	Inventory	Returns					
2	Africa	Boot	Addis Abe	12	29,761.00	########	769.00					
3	Africa	Men's Cas	Addis Abe	4	67,242.00	########	2,284.00					
4	Africa	Men's Dre	Addis Abe	7	76,793.00	########	2,433.00					
5	Africa	Sandal	Addis Abe	10	62,819.00	########	1,861.00					
6	Africa	Slipper	Addis Abe	14	68,641.00	########	1,771.00					
7	Africa	Sport Sho	Addis Abe	4	1,690.00	16,634.00	79.00					
8	Africa	Women's	Addis Abe	2	51,541.00	98,641.00	940.00					
9	Africa	Women's	Addis Abe	12	########	########	3,233.00					
10	Africa	Boot	Algiers	21	21,297.00	73,737.00	710.00					
11	Africa	Men's Cas	Algiers	4	63,206.00	########	2,221.00					
12	Africa	Men's Dre	Algiers	13	########	########	3,621.00					
13	Africa	Sandal	Algiers	25	29,198.00	84,447.00	1,530.00					
14	Africa	Slipper	Algiers	17	64,891.00	########	1,823.00					
15	Africa	Sport Sho	Algiers	9	2,617.00	9,372.00	168.00					
16	Africa	Women's	Algiers	12	90,648.00	########	2,690.00					
17	Africa	Boot	Cairo	20	4,846.00	18,965.00	229.00					

LIBNAME Example #3

This same example in SAS 9.4, a LIBNAME statement can be used to export a data set to an Excel spreadsheet file. For example, to export the data in the SASHELP.Shoes data set to an Excel 2007 and later spreadsheet, specify the following LIBNAME statement:

```
LIBNAME MY_XLSX EXCEL PATH='c:\temp\my_shoes.XLSX';
  DATA MY_XLSX.Sheet3;
    SET SASHELP.Shoes;
  RUN;
LIBNAME MY_XLSX; * release output file to use by Excel;
```

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LIBNAME Example #3
Log

```
16   LIBNAME MY_XLSX EXCEL PATH='c:\temp\my_shoes.XLSX';
NOTE: Libref MY_XLSX was successfully assigned as follows:
      Engine:        EXCEL
      Physical Name: c:\temp\my_shoes.XLSX
17     DATA MY_XLSX.Sheet3;
18       SET SASHELP.Shoes;
19     RUN;

NOTE: SAS variable labels, formats, and lengths are not written to DBMS tables.
NOTE: There were 395 observations read from the data set SASHELP.SHOES.
NOTE: The data set MY_XLSX.Sheet2 has 395 observations and 7 variables.
NOTE: DATA statement used (Total process time):
      real time           0.03 seconds
      cpu time            0.03 seconds


20   LIBNAME MY_XLSX;
NOTE: Libref MY_XLSX has been deassigned.
20 !               * release output file to use by Excel;
```

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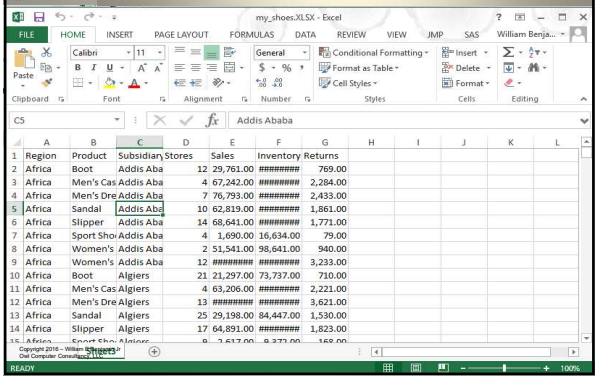
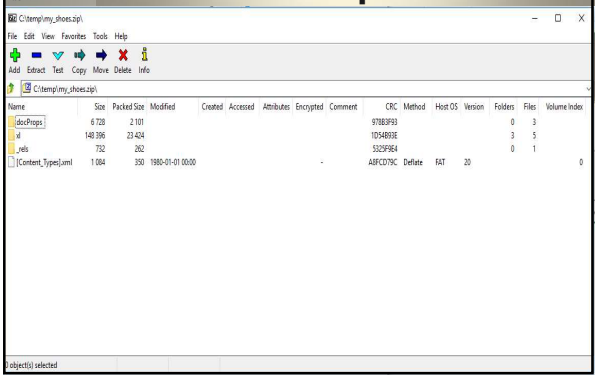
LIBNAME Example #3
in EXCEL



	A	B	C	D	E	F	G	H	I	J	K	L
1	Region	Product	Subsidiary	Stores	Sales	Inventory	Returns					
2	Africa	Boot	Addis Aba	12	29,761.00	########	769.00					
3	Africa	Men's Cas	Addis Aba	4	67,242.00	########	2,284.00					
4	Africa	Men's Dre	Addis Aba	7	76,793.00	########	2,433.00					
5	Africa	Sandal	Addis Aba	10	62,819.00	########	1,861.00					
6	Africa	Slipper	Addis Aba	14	68,641.00	########	1,771.00					
7	Africa	Sport Sho	Addis Aba	4	1,690.00	16,634.00	79.00					
8	Africa	Women's	Addis Aba	2	51,541.00	98,641.00	940.00					
9	Africa	Women's	Addis Aba	12	########	########	3,233.00					
10	Africa	Boot	Algiers	21	21,297.00	73,737.00	710.00					
11	Africa	Men's Cas	Algiers	4	63,206.00	########	2,221.00					
12	Africa	Men's Dre	Algiers	13	########	########	3,621.00					
13	Africa	Sandal	Algiers	25	29,198.00	84,447.00	1,530.00					
14	Africa	Slipper	Algiers	17	64,891.00	########	1,823.00					

LIBNAME Example #3
as a Zip file



LIBNAME Example #4

This example uses the LIBNAME options **HEADER=** and **MIXED=** to read data from an Excel Workbook spreadsheet.

```
LIBNAME xls_data EXCEL 'C:\temp\shoes.xlsx'
        HEADER=NO MIXED=YES;
        DATA Excel_data;
          SET xls_data.'shoes'n;
        RUN;
 LIBNAME xls_data;   * release output file to use by Excel;
```

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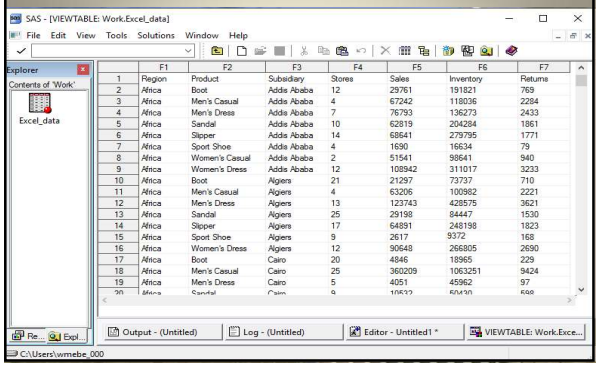
LIBNAME Example #4



Connection Options

Option	Description
HEADER	Affects the way that the first row or observation is processed.
MIXED	Affects how columns with both numeric and character data are treated.
PATH	Allows you to supply a path for an Excel file, this is not always needed.
PROMPT	Allows the SAS system provide help menus to assist with assign LIBNAMEs.
VERSION	Assigns the output Excel version, SAS can determine the input version.

LIBNAME Example #5

This example uses the SAS Dataset options to read data from an Excel Workbook spreadsheet, and convert the data format.

```
LIBNAME xls_data EXCEL 'C:\My_excel_files\sales.xlsx';
DATA Sales_data1;
   SET xls_data.'Sales_data$'n;
DATA Sales_data2;
   SET xls_data.'Sales_data$'n
      (SASDATEFMT=(Date_Shipped=TIME8.
                   Date_Delivered=DATETIME21.2));
Run;
LIBNAME xls_data; * release output file to use by Excel;
```

Data Source : http://support.sas.com/publishing/authors/benjamin.html - Example Code and Data

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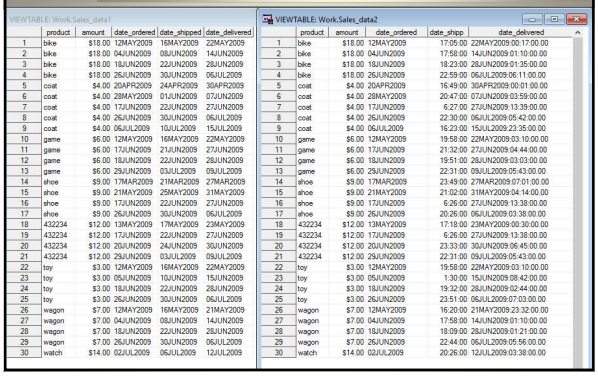
LIBNAME Example #5



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Break 20 Minutes

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SAS Enterprise Guide tools

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Enterprise Guide

My Book touches on many topics but The thrust of the book is moving data, not processing data. The book covers the following topics under the heading of Enterprise Guide. But I will only show two examples in this workshop.

Send data to	-	(Output to Excel) *
Export data to	-	(Output to Excel)
Export a graph	-	(Output to Excel or Word)
Open a Spreadsheet	-	(Input from Excel)
Import a Spreadsheet	-	(Input from Excel)
Import a range of cells	-	(Input from Excel) *

* Covered in this workshop

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Enterprise Guide – Example #1

- **Using the "Send To" Method**
  - **Steps to use the "Send To" Method**
    1. **Select a file to output, any SAS dataset will do.**
    2. **Select the "Send To" option on the File tab.**
    3. **Select the "Microsoft Excel" option displayed on the pop-up menu.**

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Enterprise Guide – Example #1

4. **Press the Microsoft Excel button to send the input SAS file directly to Microsoft Excel and to save the workbook using Excel save options.**
5. **This option opens the Microsoft Excel version installed on your computer and allows you to save the output in any Excel format you have available including Excel 2007, 2010, and 2013.**
6. **Be aware that this method of sending data to Excel may directly open Excel with the data displayed.**

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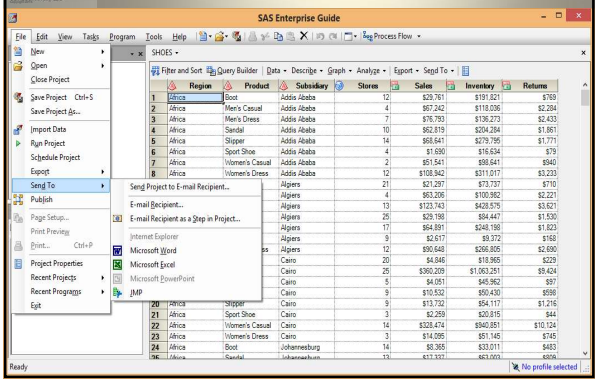
Enterprise Guide – Example #1



Enterprise Guide – Example #2

- **Using the "Import Data" Toolbar Option to Read a Range of Cells**
  1. **An Excel file has embedded information about the nature of the file.**
  2. **Enterprise Guide will analyze the input file and provide information about the file structure.**
  3. **This example shows that the Import Data tool can recognize a named range within an Excel file and extract only those cells from the spreadsheet.**

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Enterprise Guide – Example #2

4. **Additionally, you can choose to keep or drop fields within the range before reading the data into a SAS dataset.**
5. **Excel named ranges can be generated using the "FORMULA" tab and the "Name Manager" option of Excel.**
6. **The part of the "Shoes" worksheet that starts with the upper left cell (C2) and includes all of the cells in the rows and columns that are between C2 to G9. This is a group of 40 cells**

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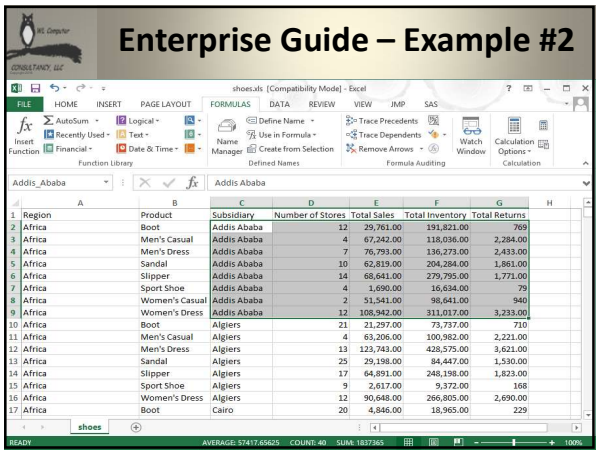
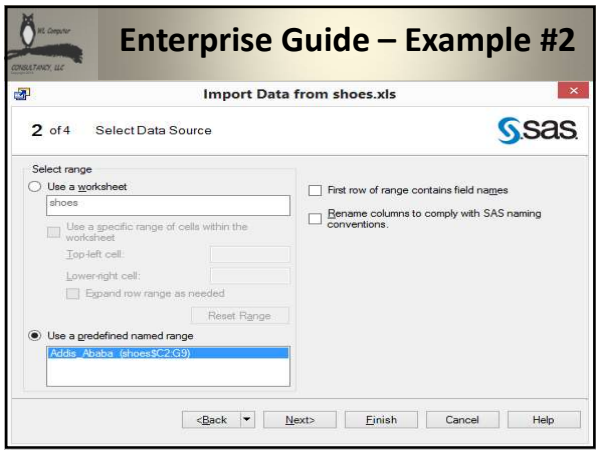
Enterprise Guide – Example #2

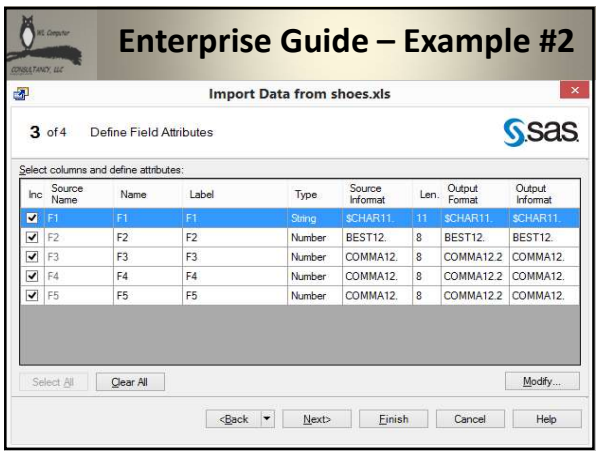


Region	Product	Subsidiary	Number of Stores	Total Sales	Total Inventory	Total Returns
Africa	Boot	Addis Ababa	12	29,761.00	191,821.00	769
Africa	Men's Casual	Addis Ababa	4	67,242.00	118,036.00	2,284.00
Africa	Men's Dress	Addis Ababa	7	76,793.00	136,273.00	2,433.00
Africa	Sandal	Addis Ababa	10	62,819.00	204,284.00	1,861.00
Africa	Slipper	Addis Ababa	14	68,641.00	279,795.00	1,771.00
Africa	Sport Shoe	Addis Ababa	4	1,690.00	16,634.00	79
Africa	Women's Casual	Addis Ababa	2	51,541.00	98,641.00	940
Africa	Women's Dress	Addis Ababa	12	108,942.00	311,017.00	3,233.00
Africa	Boot	Algiers	21	21,297.00	73,737.00	710
Africa	Men's Casual	Algiers	4	63,206.00	100,982.00	2,221.00
Africa	Men's Dress	Algiers	13	123,743.00	428,575.00	3,621.00
Africa	Sandal	Algiers	25	29,198.00	84,447.00	1,530.00
Africa	Slipper	Algiers	17	64,891.00	248,198.00	1,823.00
Africa	Sport Shoe	Algiers	9	2,617.00	9,372.00	168
Africa	Women's Dress	Algiers	12	90,648.00	266,805.00	2,690.00
Africa	Boot	Cairo	20	4,846.00	18,965.00	229

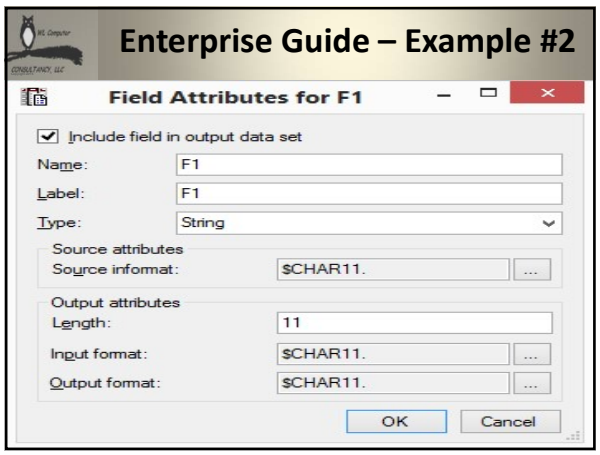
Enterprise Guide – Example #2



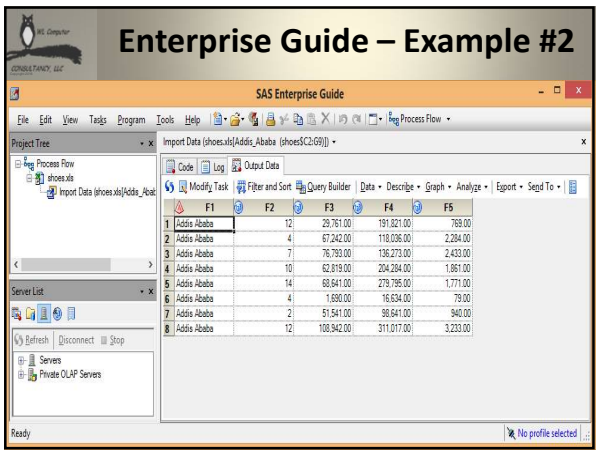
Enterprise Guide – Example #2



Enterprise Guide – Example #2



Enterprise Guide – Example #2



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Using JMP to Share Data with Excel

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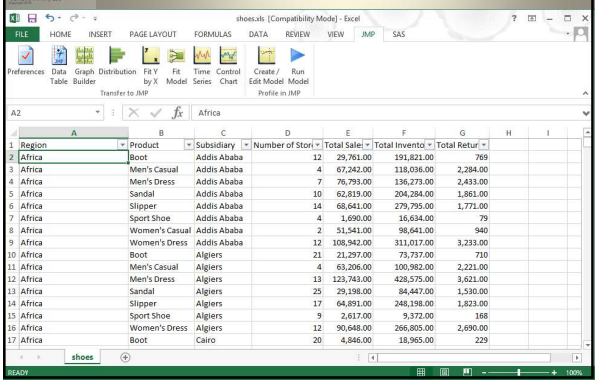
Excel workbook with the JMP Tab



Excel Options Under JMP Tab

Group	Option	Function
Transfer to JMP	Preferences	Identify Excel data to load into JMP
	Data Table	Load data into a JMP table, this will also start JMP if it is not running
	Graph builder	Transfer Excel data and launch the Graph Builder platform
	Distribution	Transfer Excel data and launch the Distribution platform
Profile in JMP	Create/Edit Model	Set up preferences in the JMP profiler with Excel data
	Run Model	Run the JMP profiler

JMP Preferences

1. Select the output JMP table name
2. Choose whether or not to use the first rows of Excel cells as column names
3. Choose how many rows to use as column names
4. Turn on or off the transfer of hidden Rows
5. Turn on or off the transfer of hidden Columns

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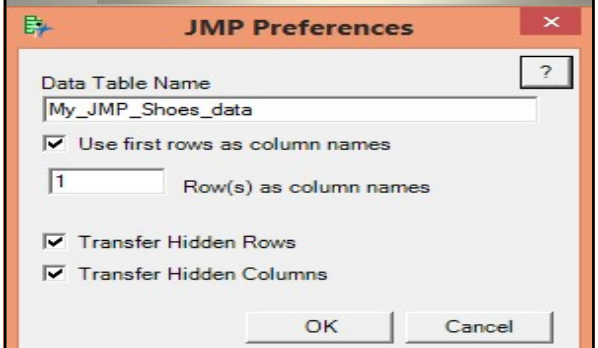
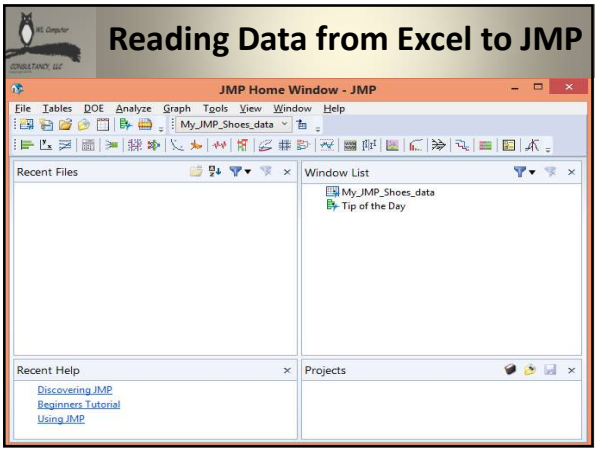
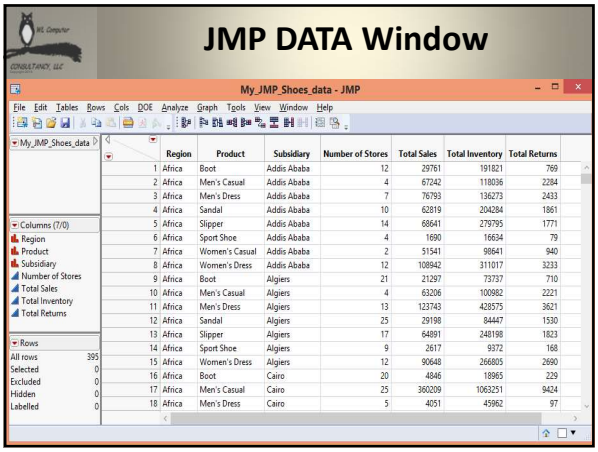
JMP Preferences



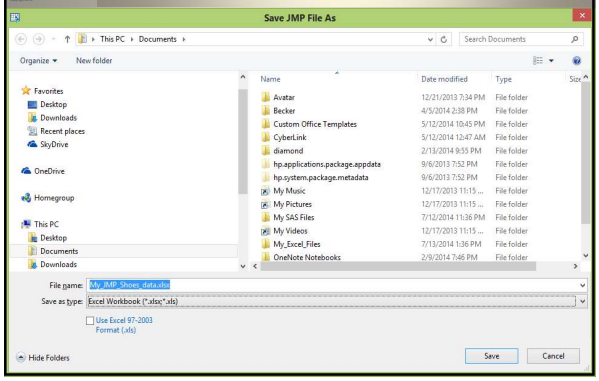
Reading Data from Excel to JMP



JMP DATA Window



Write to Excel JMP Save Window



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SAS Add-In for Microsoft Office

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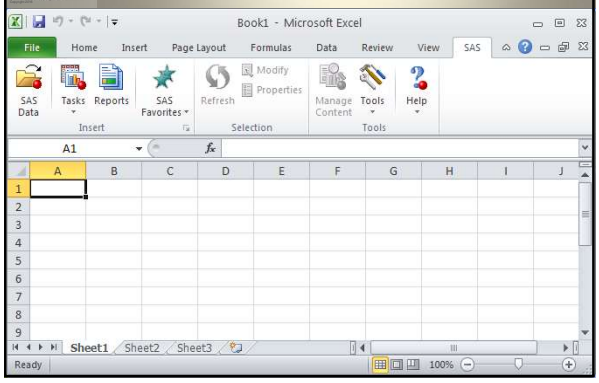
SAS ADD-IN Task Availability

		Tasks			
		Process SAS Data	Run SAS Tasks	Run SAS Reports	Share SAS Reports
Product	Excel	Yes	Yes	Yes	No
	Word	No	Yes	Yes	No
	Power Point	No	Yes	Yes	No
	Outlook	No	No	No	Yes

SAS Deployment Wizard Sharing Options

Excel workbook with the SAS Tab



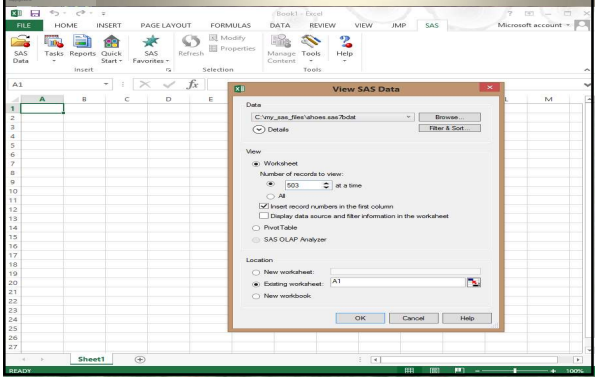
Excel Options Under SAS Tab

SAS Add-in for Microsoft Office Excel Menu Options

Group	Option	Function
Insert	SAS Data	Open a SAS data source
	Tasks	Perform one of over 75 options including sorting, transposing and graphing
	Reports	Allows searching the network and executing available *.srx report routines
	Quick Start	Allows for the selection of multiple graphing tasks, automatic charts, and staticital processes.
	SAS Favorites	Allows storing and executing favorite report routines in a profile file
Selection	Refresh **	Re-run an analysis
	Modify **	Change any optional parameters available to the task
	Properties**	Allows review and changing of report properties
Tools	Manage Content**	Allows changing optional parameters and running selected reports
	Tools	Several features for managing data, reports, styles, and scheduling reports
	Help	Help information for SAS Add-in for Microsoft Office

** - Available after a report is executed

View SAS Data Screen



Options for Reading SAS Data

Part 1

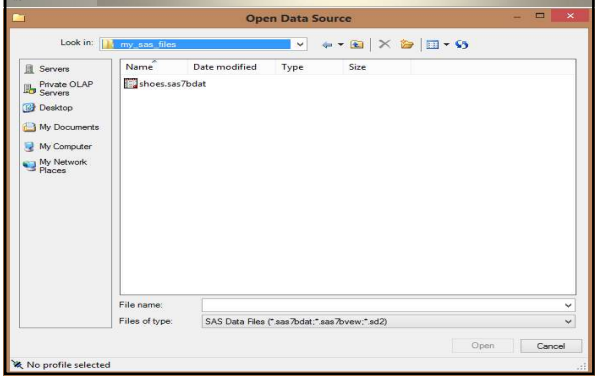
Section	Option	Description
Data	Combo Box	List of flie names that have been used
	Browse	This button allows you to search got a file to select for input
	Details	This selection arrow displays or hides the data options selected
	Filter & Sort	This button causes a pop-up menu to appear that allows you to . select columns to read or exclude . Filter the rows to input . Sort the data before displaying

Options for Reading SAS Data

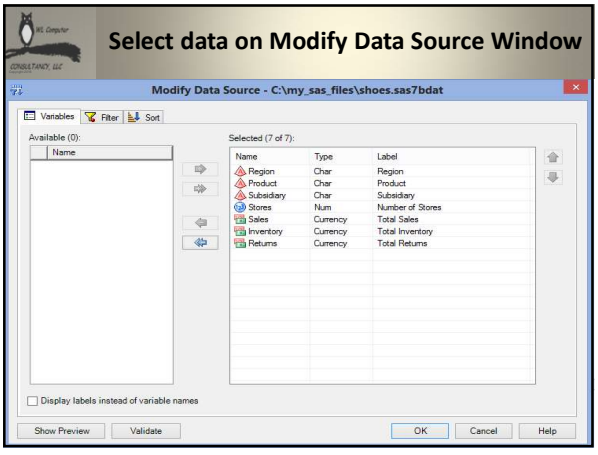
Part 2

Section	Option	Description
View	Worksheet	This options controls the following . Number of records to view . Whether or not record numbers are inserted into the Excel worksheet . Whether or not to display data source and filter information in the worksheet . Whether or not to create a Pivot Table . Whether or not to use the SAS OLAP Analyzer
Location	New Worksheet	Name of a new worksheet to create
	Existing Worksheet	The location to place the data into an existing worksheet
	New Workbook	Allows for the creation of a new workbook, usually titled "Bookn" where "n" is the next number not used for an Excel workbook named "BOOK"

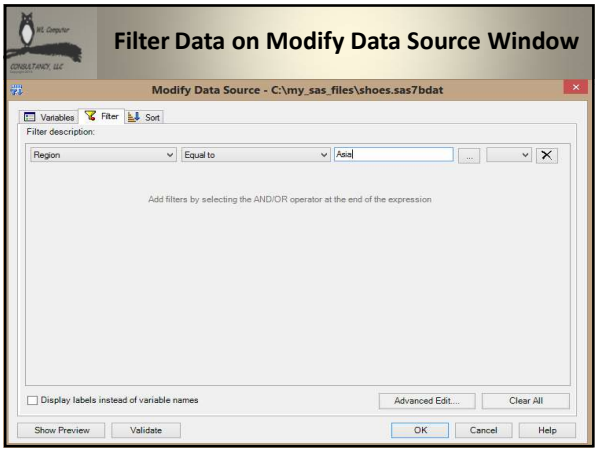
SAS ADD-IN Open Data Source



Select data on Modify Data Source Window



Filter Data on Modify Data Source Window



Excel Sheet From a SAS Data Set

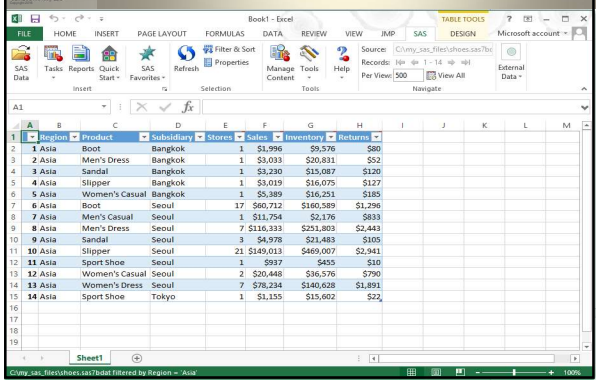
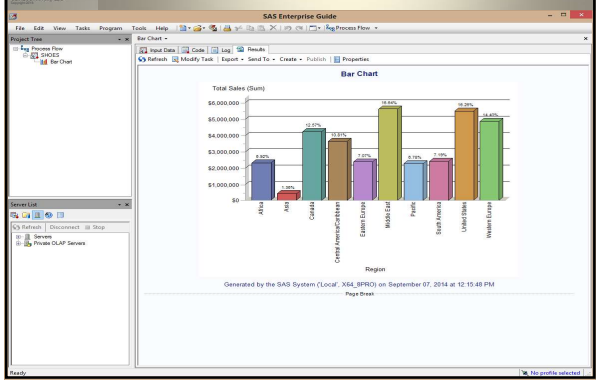
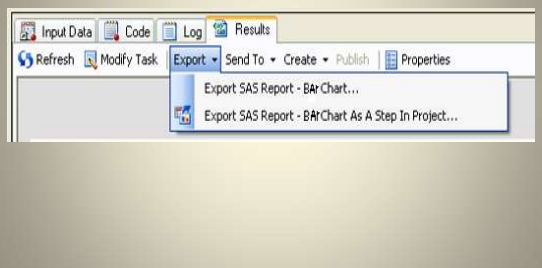


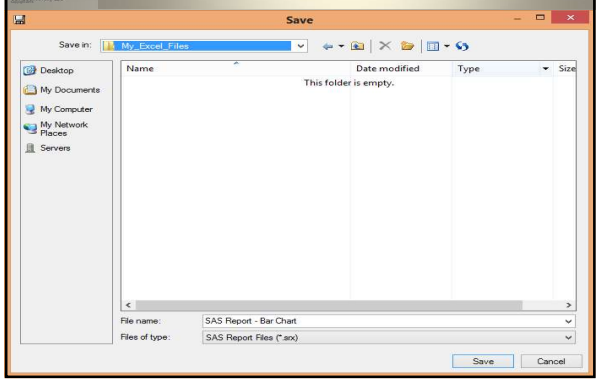
Chart Built in SAS Enterprise Guide



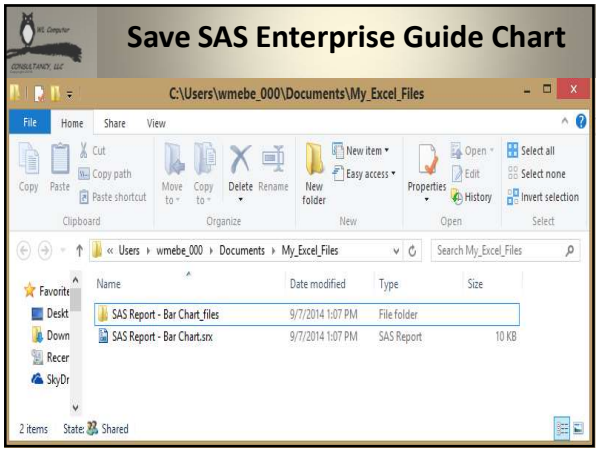
Save SAS Enterprise Guide Chart



Save SAS Enterprise Guide Chart

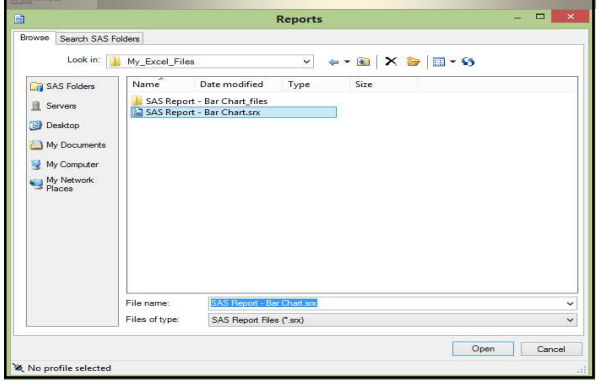


Save SAS Enterprise Guide Chart

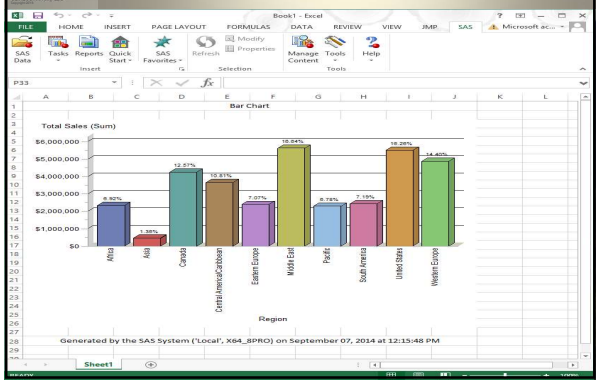


Export Windows

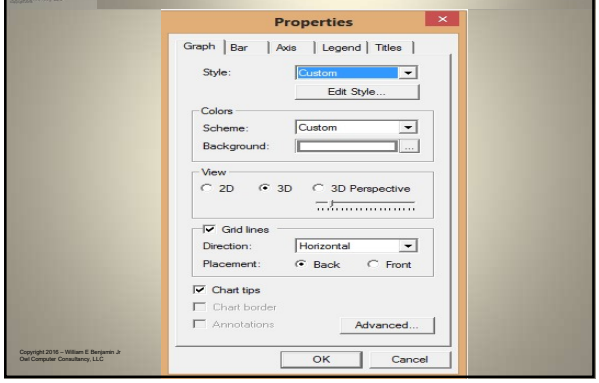
Excel (import) Reports Window



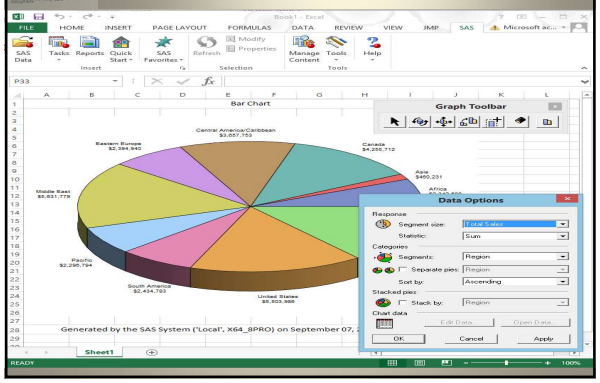
SAS Report (.srx) File open in Excel



Initial Excel Properties Window



Properties modified by Active-X



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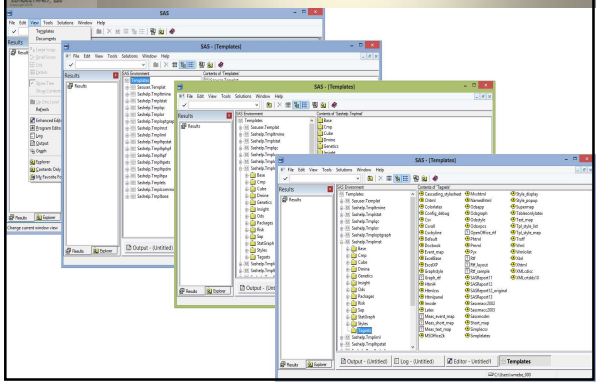
Overview of OUTPUT DELIVERY SYSTEM:

OUTPUT METHODS

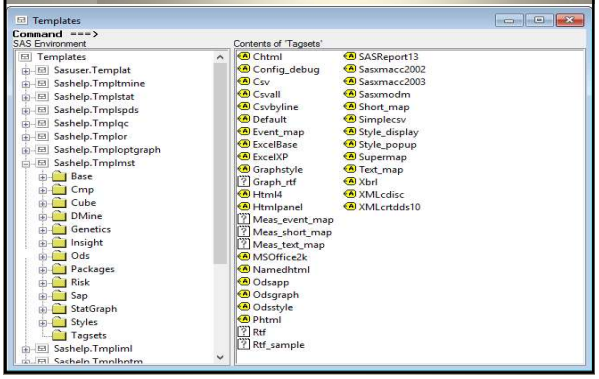
Most Used ODS to Excel Methods

• CSV	Destination & Tagset
• CSVALL	Destination & Tagset
• MSOFFICE2K	Destination & Tagset
• EXCELXP	Tagset only
• EXCEL	Destination only

Output Delivery System: Tagsets



Output Delivery System: Tagsets



Output Delivery System

ODS Option	Destination or Tagset	Output
CSV	Both	Create a text file with values separated by a delimiter
CSVALL	Both	Create a text file with values separated by a delimiter
MSOFFICE2K	Both	Create a text file with HTML formatted data values
EXCELXP	Tagset	Create a text file with XML formatted data values
EXCEL	Destination	Create a Microsoft Excel file in *.xlsx native (Open XML) format

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ODS Tagset CSV/CSVALL Options

These tagsets write raw text files

Differences between CSV and CSVALL

- CSV is the parent of CSVALL
- CSV and CSVALL have different defaults

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ODS Options for CSV and CVSALL

BYLINES	CURRENCY_SYMBOL	PERCENTAGE_AS_NUMBER
PROC_TITLES	DECIMAL_SEPARATOR	PREPEND_EQUALS
TITLES	DELIMITER	THOUSANDS_SEPARATOR
TABLE_HEADERS	QUOTE_BY_TYPE	NOTES
CURRENCY_AS_NUMBER	QUOTED_COLUMNS	DOC

Tagset Example #1 CSV/CSVALL

- CSV Tagsets CSV and CSVALL

```
ODS TAGSETS.CSV BODY='c:\temp\csv\shoes3.csv';
      PROC PRINT DATA=sashelp.shoes;
      RUN;
ODS TAGSETS.CSV CLOSE;

ODS TAGSETS.CSVALL
BODY='c:\temp\csvall\shoes3.csv';
      PROC PRINT DATA=sashelp.shoes;
      RUN;
ODS TAGSETS.CSVALL CLOSE
```

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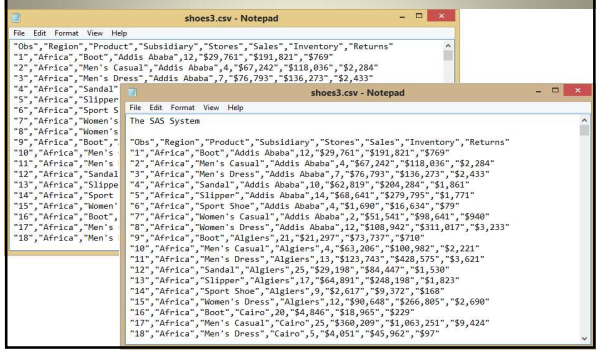
Tagset Example #1 CSV/CSVALL



Tagset Example #2 CSV/CSVALL

```
title 'Testing Title options BYLINES - PROC_TITLES - TITLES and FOOTNOTES';
footnote 'Testing footnote options BYLINES - PROC_TITLES - TITLES and
FOOTNOTES';

ODS TAGSETS.CSV    BODY='c:\temp\csv\csv_shoes.csv';
ODS TAGSETS.CSVALL BODY='c:\temp\csv\csvall_shoes.csv';

PROC PRINT DATA=sashelp.shoes
    (WHERE=(product = 'Boot' and region in('Asia' , 'Canada')));
    BY region;
RUN;

PROC FREQ DATA=sashelp.shoes;
   TABLE product / LIST;
RUN;

ODS TAGSETS.CSV CLOSE;
ODS TAGSETS.CSVALL CLOSE;
```

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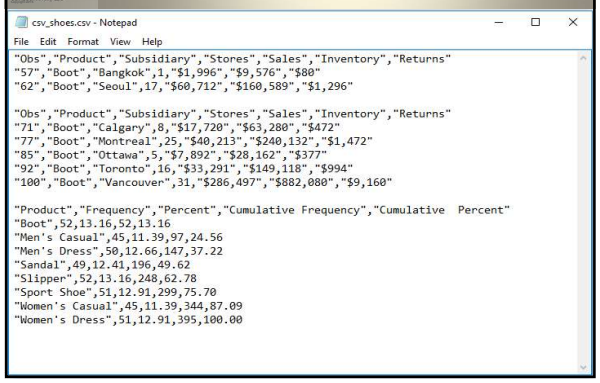
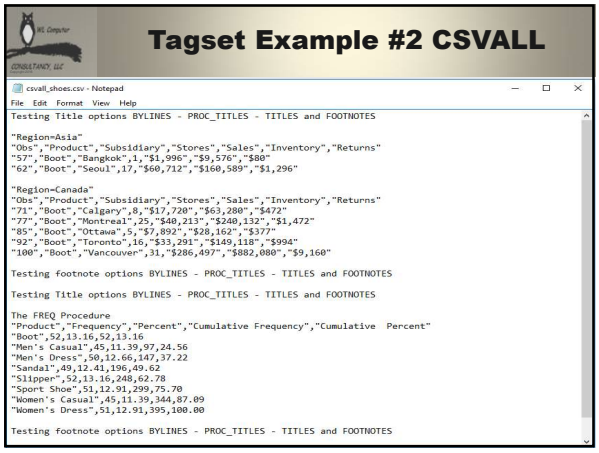
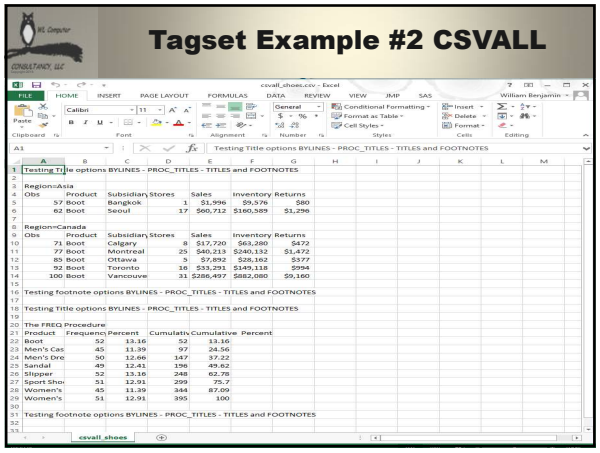
Tagset Example #2 CSV



Tagset Example #2 CSVALL



Tagset Example #2 CSVALL



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ODS Tagset MSOFFICE2K Options

This tagset writes HTML text files

ODS Options for MSOFFICE2K

HEADER_DATA_ASSOCIATIONS	SUMMARY_AS_CAPTION
HEADER_DOTS	SUMMARY_BYVALS
PERCENTAGE_FONT_SIZE	SUMMARY_BYVARS
CSS_TABLE	SUMMARY_PREFIX
PAGE_BREAK	DOC
SUMMARY	

Tagset Example #3 MSOFFICE2K

The MSOFFICE2K example below uses ODS tagset commands to execute the
features an example using MSOFFICE2K tagset template. ODS command Sequences shown here execute the MSOFFICE2K processing. This method is part of BASE SAS.

```
ODS MSOFFICE2K BODY ='c:\temp\msoffice2k\shoes2.htm';
  options obs=1;
    PROC PRINT DATA =sashelp.shoes;
    RUN;
  options obs=max;
ODS MSOFFICE2K CLOSE;
```

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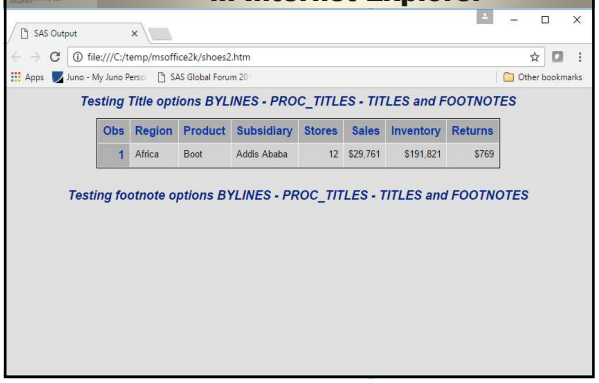
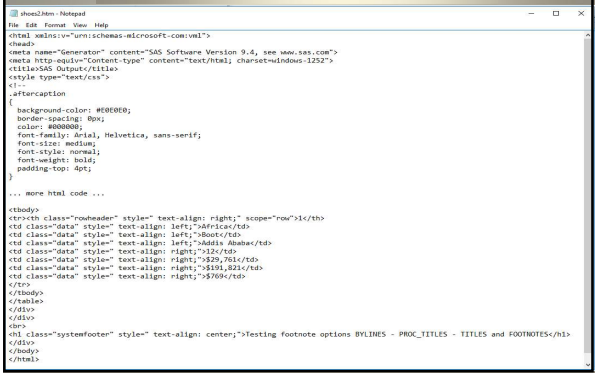
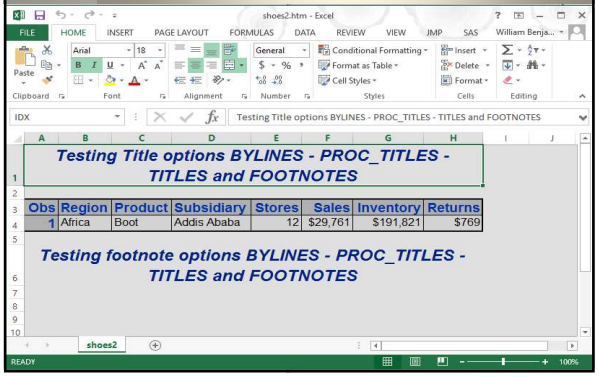
Tagset Example #3 MSOFFICE2K in Internet Explorer

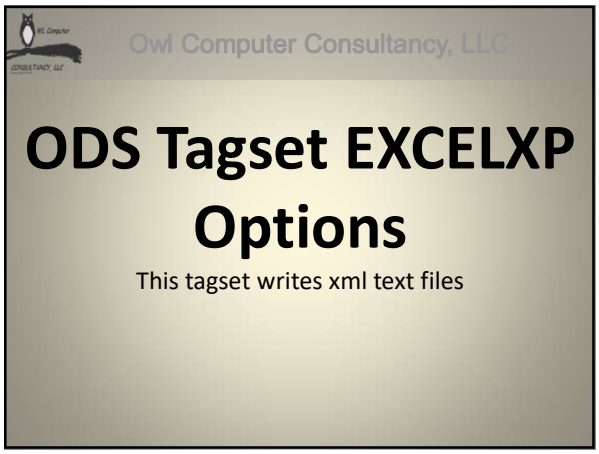


Tagset Example #3 MSOFFICE2K HTML



Tagset Example #3 MSOFFICE2K EXCEL





Options related to titles and footnotes	
EMBED_TITLES_ONCE	If yes, embedded titles will only appear at the top of each worksheet
EMBEDDED_FOOTNOTES	Put footnotes in the worksheet
EMBEDDED_TITLES	Put titles in the worksheet
MERGE_TITLES_FOOTNOTES	Merge left justified titles and footnotes.
PRINT_FOOTER	If no footers or embedded footnotes are on, this is used as print footer
PRINT_FOOTER_MARGIN	This is the footer margin as set in the page set up dialog window
PRINT_HEADER	If no titles or embedded titles are on, this is used as print header
PRINT_HEADER_MARGIN	This is the header margin as set in the page set up dialog window
TITLE_FOOTNOTE_WIDTH	The number of columns titles and footnotes are

Options related to Excel display Features	
FROZEN_HEADERS	Freeze rows from scrolling with the scrollbar
FROZEN_ROWHEADERS	Freeze columns from scrolling with the scrollbar
MISSING_ALIGN	Sets the alignment for missing values
ORIENTATION	Print orientation for the worksheet, Portrait or Landscape
WRAPTEXT	This value turns "WRAPTEXT" on and off for all style definitions
ZOOM	This value determines the zoom level on the worksheet

Options related to summary tables	
SUMMARY	Select quoted value to use as text on end of the table summary
SUMMARY_AS_CAPTION	Select "YES" to use the table summary to create a table caption
SUMMARY_BYVALS	Add the values of the by variables to the table summary
SUMMARY_BYVARS	Selecting "YES" will add the by variable list to the table summary
SUMMARY_PREFIX	Quoted value to be added to the end of the table summary
Options related to Column features:	
ABSOLUTE_COLUMN_WIDTH	List of widths to use for each column
COLUMN_REPEAT	Repeat columns across pages when printing
DEFAULT_COLUMN_WIDTH	List of widths to use for each column in a table, if there are no widths
HIDDEN_COLUMNS	Range or list of column numbers to hide
WIDTH_FUDGE	This value is used to calculate an approximate table column width
WIDTH_POINTS	Override value for width calculations

Options related to Row features	
AUTOFIT_HEIGHT	If yes, no row heights will be specified
ROW_HEIGHT_FUDGE	A fudge value to add to the row height for each row
ROW_HEIGHTS	Positional list of point sizes to use for row heights
ROW_REPEAT	Repeat rows across pages when printing
ROWCOLHEADINGS	This turns on row and column headings for printing
Options related to Data features	
ASCII_DOTS	Turn off/on leading dots in textual 'batch' output
AUTO_SUBTOTALS	Add a subtotal function to the summary line of proc print
AUTOFILTER	Turn on auto filter for all columns or a range of columns
AUTOFILTER_TABLE	Which table on the worksheet should get the filters
CONVERT_PERCENTAGES	Remove percent sign, apply Excel percent format, and multiply by 100
FORMULAS	Data values starting with an '=' will become formulas
NUMERIC_TEST_FORMAT	Used for determining if a value is numeric or not
THOUSANDS_SEPARATOR	The character used for indicating thousands in numeric values

Options related to Printing features	
BLACKANDWHITE	This value turns on black and white for printing
CENTER_HORIZONTAL	This value controls horizontal centering for printing
CENTER_VERTICAL	This value controls vertical centering for printing
CURRENCY_FORMAT	The currency format specified for Excel to use
CURRENCY_SYMBOL	Detection of currency formats and symbols so Excel outputs numbers
DECIMAL_SEPARATOR	The character used for the decimal point
DPI	This value determines the dots per inch for printing
DRAFTQUALITY	This value turns on draft quality for printing
FITTOPAGE	Fit to Page when printing
GRIDLINES	This value turns on gridlines for printing
PAGE_ORDER_ACROSS	If yes, the worksheet page order will be set to print across, then down
PAGEBREAKS	Insert page break lines in the worksheet
PAGES_FITHEIGHT	Determines number of pages down to fit the worksheet when printing
PAGES_FITWIDTH	Determines number of pages across to fit the worksheet when printing
SCALE	This value determines the scale level for printing
SHEET_INTERVAL	Interval to divide the output between worksheets

Options related to Workbook features	
BLANK_SHEET	Create a Blank Worksheet with the name given
CONTENTS	Create a worksheet that will contain a table of contents
CONTENTS_WORKBOOK	Create a workbook table of contents and/or an index of workbooks and/or an index of worksheets
INDEX	Create a worksheet that will contain a index of worksheets
MINIMIZE_STYLE	Minimize styles written to stylesheets. (Can cause unloadable XML files)
SKIP_SPACE	Multiplier for the space that follows the different types of output
SUPPRESS_BYLINES	Suppresses bylines in the worksheet
SHEET_LABEL	Replace the prefix of the worksheet name with this value
SHEET_NAME	Worksheet name to use for the next worksheet
BLANK_SHEET	Create a Blank Worksheet with the name given
Options related to Tagset template documentation	
DOC	Write user help information about the tagset template options to the system log

EXCELXP Tagset Versions

The EXCELXP ODS Tagset template has long been the mainstay – go to program for writing data to an excel readable file. This tagset has the ability to write multiple worksheets into an Excel readable file. It was released as a PROC TEMPLATE coded text file that has been released As both part of a SAS release and a downloadable text file on the internet. This tagset writes an xml formatted text file.

Version	Comment
V1.28	Shipped with SAS V9.1.3M
V1.37	June 2006 version available on web site
V1.62	May 2007 version available on web site
V1.72	June 2007 version available on web site
V1.86	April 2008 version available on web site
V1.94	Shipped with SAS V9.2
V1.116	August 2010 version available on web site
V1.122	Shipped with SAS V9.3
V1.130	August 2013 version available on web site
V1.131	April 2015 version available on web site (also 9.4)

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Tagset Example #4 EXCELXP

This example uses the EXCELXP tagset to write an xml file that can support multiple Excel worksheets in one file.

```
ODS TAGSETS.EXCELXP BODY='c:\temp\ExcelXP\shoes4.xml'
        OPTIONS(SHEET_NAME='One Region');

     PROC PRINT DATA=sashelp.shoes;
       BY region;
     RUN;

ODS TAGSETS.EXCELXP CLOSE;
```

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Tagset Example #4 EXCELXP Log

```
95  ODS TAGSETS.EXCELXP BODY='c:\temp\ExcelXP\shoes4.xml'
96        OPTIONS(SHEET_NAME='One Region');
NOTE: Writing TAGSETS.EXCELXP Body file: c:\temp\ExcelXP\shoes4.xml
NOTE: This is the Excel XP tagset (Compatible with SAS 9.1.3 and above, v1.131, 04/23/2015).
Add options(doc='help') to the ods statement for more information.
97
98         PROC PRINT DATA=sashelp.shoes;
NOTE: Writing HTML Body file: sashtml1.htm
99           BY region;
100        RUN;

NOTE: There were 395 observations read from the data set SASHELP.SHOES.
NOTE: PROCEDURE PRINT used (Total process time):
      real time          1.45 seconds
      cpu time           1.15 seconds

101
102  ODS TAGSETS.EXCELXP CLOSE;
```

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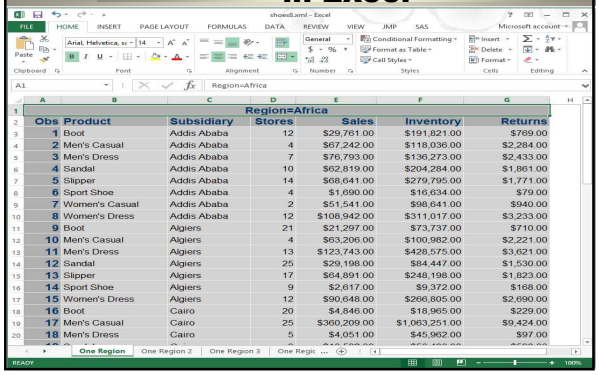
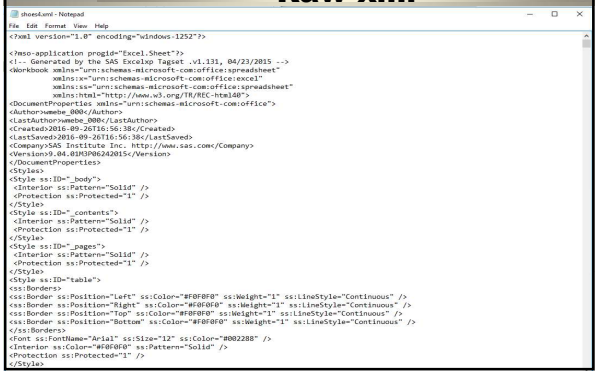
Tagset Example #4 EXCELXP in Excel



	Obs	Product	Subsidiary	Stores	Sales	Inventory	Returns
1		Region=Africa					
2	1	Boot	Addis Ababa	12	$29,761.00	$191,821.00	$769.00
3	2	Men's Casual	Addis Ababa	4	$67,242.00	$118,036.00	$2,284.00
4	3	Men's Dress	Addis Ababa	7	$76,793.00	$136,273.00	$2,433.00
5	4	Sandal	Addis Ababa	10	$62,819.00	$204,284.00	$1,861.00
6	5	Slipper	Addis Ababa	14	$68,641.00	$279,795.00	$1,771.00
7	6	Sport Shoe	Addis Ababa	4	$1,690.00	$16,634.00	$79.00
8	7	Women's Casual	Addis Ababa	2	$51,541.00	$98,641.00	$940.00
9	8	Women's Dress	Addis Ababa	12	$108,942.00	$311,017.00	$3,233.00
10	9	Boot	Algiers	21	$21,297.00	$73,737.00	$710.00
11	10	Men's Casual	Algiers	4	$63,206.00	$100,982.00	$2,221.00
12	11	Men's Dress	Algiers	13	$123,743.00	$428,575.00	$3,621.00
13	12	Sandal	Algiers	25	$29,198.00	$84,447.00	$1,530.00
14	13	Slipper	Algiers	17	$64,891.00	$248,198.00	$1,823.00
15	14	Sport Shoe	Algiers	9	$2,617.00	$9,372.00	$168.00
16	15	Women's Dress	Algiers	12	$90,648.00	$266,805.00	$2,690.00
17	16	Boot	Cairo	20	$4,846.00	$18,965.00	$229.00
18	17	Men's Casual	Cairo	25	$360,209.00	$1,063,251.00	$9,424.00
19	18	Men's Dress	Cairo	5	$4,051.00	$45,962.00	$97.00

Tagset Example #4 EXCELXP Raw xml



```
<?xml version="1.0" encoding="windows-1252"?>

<?mso-application progid="Excel.Sheet"?>
<!-- Generated by the SAS ExcelXp Tagset .v1.131, 04/23/2015 -->
<Workbook xmlns="urn:schemas-microsoft-com:office:spreadsheet"
          xmlns:x="urn:schemas-microsoft-com:office:excel"
          xmlns:ss="urn:schemas-microsoft-com:office:spreadsheet"
          xmlns:html="http://www.w3.org/TR/REC-html40">
<DocumentProperties xmlns="urn:schemas-microsoft-com:office">
<Author>wmebe_000</Author>
<LastAuthor>wmebe_000</LastAuthor>
<Created>2016-09-26T16:56:38</Created>
<LastSaved>2016-09-26T16:56:38</LastSaved>
<Company>SAS Institute Inc. http://www.sas.com</Company>
<Version>9.04.01M3P06242015</Version>
</DocumentProperties>
<Styles>
<Style ss:ID="_body">
 <Interior ss:Pattern="Solid" />
 <Protection ss:Protected="1" />
</Style>
<Style ss:ID="_contents">
 <Interior ss:Pattern="Solid" />
 <Protection ss:Protected="1" />
</Style>
<Style ss:ID="_pages">
 <Interior ss:Pattern="Solid" />
 <Protection ss:Protected="1" />
</Style>
<Style ss:ID="table">
<ss:Borders>
<ss:Border ss:Position="Left" ss:Color="#F0F0F0" ss:Weight="1" ss:LineStyle="Continuous" />
<ss:Border ss:Position="Right" ss:Color="#F0F0F0" ss:Weight="1" ss:LineStyle="Continuous" />
<ss:Border ss:Position="Top" ss:Color="#F0F0F0" ss:Weight="1" ss:LineStyle="Continuous" />
<ss:Border ss:Position="Bottom" ss:Color="#F0F0F0" ss:Weight="1" ss:LineStyle="Continuous" />
</ss:Borders>
<Font ss:FontName="Arial" ss:Size="12" ss:Color="#002288" />
<Interior ss:Color="#F0F0F0" ss:Pattern="Solid" />
<Protection ss:Protected="1" />
</Style>
```

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ODS EXCEL Destination Options

This destination writes native xlsx files

ODS EXCEL destination Arguments

ID	DPI	OPTIONS
ANCHOR	EXCLUDE	SASDATE
AUTHOR	FILE	SELECT
BOX_SIZING	GFOOTNOTE	SHOW
CATEGORY	NOGFOOTNOTE	STATUS
CLOSE	GTITLE	STYLE
COMMENTS	NOGTITLE	TEXT
CSSSTYLE	IMAGE_DPI	TITLE
DOM	KETWORDS	WORK

ODS EXCEL destination Options

ABSOLUTE_COLUMN_WIDTH	ABSOLUTE_ROW_HEIGHT	AUTOFILTER
BLACKANDWHITE	BLANK_SHEET	CENTER_HORIZONTAL
CENTER_VERTICAL	COLUMN_REPEAT	CONTENTS
DPI	DRAFTQUALITY	EMBEDDED_FOOTNOTES
EMBED_FOOTNOTES_ONCE	EMBED_FOOTERS_ONCE	EMBEDDED_TITLES
EMBED_TITLES_ONCE	FITTOPAGE	FORMULAS
FROZEN_HEADERS	FROZEN_ROWHEADERS	GRIDLINES
HIDDEN_COLUMNS	HIDDEN_ROWS	INDEX
MSG_LEVEL	ORIENTATION	PAGE_ORDER_ACROSS

ODS EXCEL destination Options

PAGES_FITHEIGHT	PAGES_FITWIDTH	PRINT_AREA
PRINT_FOOTER	PRINT_FOOTER_MARGIN	PRINT_HEADER
PRINT_HEADER_MARGIN	ROWBREAKS_COUNT	ROWBREAKS_INTERVAL
ROWCOLHEADINGS	ROW_HEIGHTS	ROW_REPEAT
SCALE	SHEET_INTERVAL	SHEET_LABEL
SHEET_NAME	START_AT	SUPPRESS_BYLINES
TAB_COLOR	TITLE_FOOTNOTE_NOBREAK	TITLE_FOOTNOTE_WIDTH
ZOOM		

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ODS EXCEL Destination Examples

The ODS EXCEL Destination

1. The ODS Excel Destination is a new data transfer method.
2. It has many features of the ExcelXP Tagset.
3. It is part of BASE SAS. Unlike EXCELXP which is delivered as source code within the SASHELP.Tmplmst tagset files.

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The ODS EXCEL Destination

4. The EXCEL Destination can not be updated by users
5. It first shipped as experimental with SAS Version 9.4 TS Level 1M1.
6. The outputs of this ODS destination are native Open XML format Excel workbooks for the version 2007 format and later.

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Example #5 EXCEL Destination

```
ODS EXCEL FILE='c:\temp\Excel\shoes_native.xlsx';
   PROC PRINT DATA=sashelp.shoes;
   BY region;
   RUN;
ODS EXCEL CLOSE;
```

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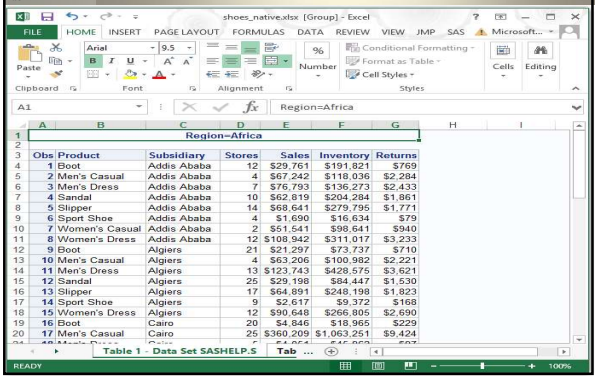
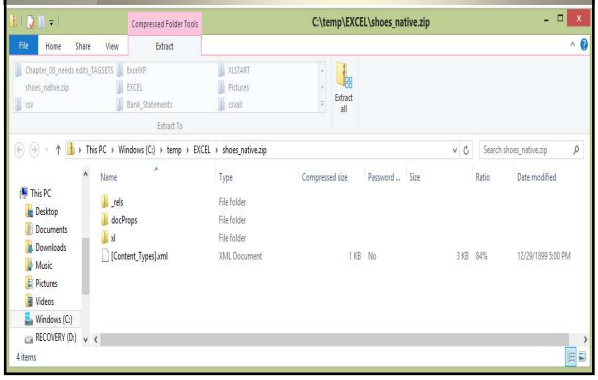
Example #5 EXCEL Destination



Region=Africa

Obs	Product	Subsidiary	Stores	Sales	Inventory	Returns
1	Boot	Addis Ababa	12	$29,761	$191,821	$769
2	Men's Casual	Addis Ababa	4	$67,242	$118,036	$2,284
3	Men's Dress	Addis Ababa	7	$76,793	$136,273	$2,433
4	Sandal	Addis Ababa	10	$62,819	$204,284	$1,861
5	Slipper	Addis Ababa	14	$68,641	$279,795	$1,771
6	Sport Shoe	Addis Ababa	4	$1,690	$16,634	$79
7	Women's Casual	Addis Ababa	2	$51,541	$98,641	$940
8	Women's Dress	Addis Ababa	12	$108,942	$311,017	$3,233
9	Boot	Algiers	21	$21,297	$73,737	$710
10	Men's Casual	Algiers	4	$63,206	$100,982	$2,221
11	Men's Dress	Algiers	13	$123,743	$428,575	$3,621
12	Sandal	Algiers	25	$29,198	$84,447	$1,530
13	Slipper	Algiers	17	$64,891	$248,198	$1,823
14	Sport Shoe	Algiers	9	$2,617	$9,372	$168
15	Women's Dress	Algiers	12	$90,648	$266,805	$2,690
16	Boot	Cairo	20	$4,846	$18,965	$229
17	Men's Casual	Cairo	25	$360,209	$1,063,251	$9,424

Example #5 EXCEL Destination



Conclusion

We covered a variety of methods and approaches:

- Exploring older transfer methods
  - CSV, TAB, and Delimited Text Files
  - Display Manager commands
  - PROC EXPORT
  - PROC IMPORT
- Examining the LIBNAME engine
  - Options for processing Worksheets
  - Options to modify variables

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Conclusion

- Using SAS Enterprise Guide transfer methods
  - Importing Data
  - Exporting Data
  - Importing Graphs and Tables
- Using SAS JMP transfer methods
  - Importing Data
  - Exporting Data
- Demystifying Output Delivery System methods
  - Using Tagsets and Destinations
  - Explore single and multiple sheet methods
  - Create unformatted and formatted data outputs

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Your Attendance was appreciated

Questions ?

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SAS Certified Base Programmer for SAS 9

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REFERENCE

Benjamin, William E., Jr. 2015. *Exchanging Data Between SAS® and Microsoft Excel: Tips and Techniques to Transfer and Manage Data More Efficiently*. Cary, NC: SAS Institute Inc.

The material used was based upon information from Chapters 1 to 8, additional new material was included.

Second data source:

http://support.sas.com/publishing/authors/benjamin.html

See the Example Code and Data file in Chapter 4 called Data_for_DATE_file.txt