GET THE MOST OUT OF THE OUTPUT DELIVERY SYSTEM FOR FANTASTIC REPORTING

CHEVELL PARKER, SAS INSTITUTE INC.

Overview

- Enhance reporting using HTML and Web pages
- What you should know about exporting to Excel
- Enhancing reports using styles and other ODS tools

Enhance Reporting using HTML and Web pages

- Mobile technology and Web pages
- Tips for writing to the body of an email
- Enhancing output using the TableEditor tagset
- Doing more with the new HTML5 destination

Generating Output on Mobile Devices

- Output needs to be accessible from a desktop as well as from mobile devices.
- Pages need to render on all devices efficiently with a consistent look and feel.
- Pages and images should load quickly on all mobile browsers.
- The viewport and screen sizes on mobile devices have limitations.
- The display format needs to account for phones and tablets that use dual orientation.
- Fonts that you can access on a desktop machine are not always available on mobile devices.

Optimizing Mobile Output

The Viewport `<meta>` Tag

- Enables you to set up a web page for cross-device layout
- Is used by most major browsers (it was introduced originally by Apple Inc.)
- Is the single-most important change for mobile devices
- Should be added for devices that are less than 980px in width
- Is added to the header of the HTML file

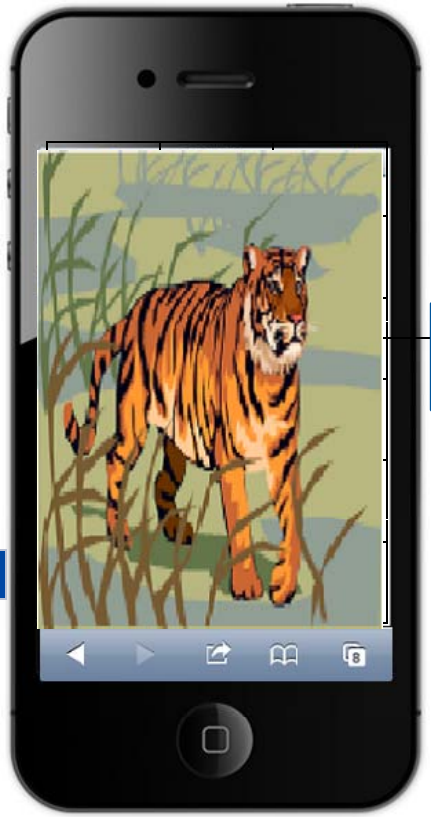
Optimizing Mobile Output *(continued)*

Setting the Viewport

```
<meta name="viewport" content="width=320">
```

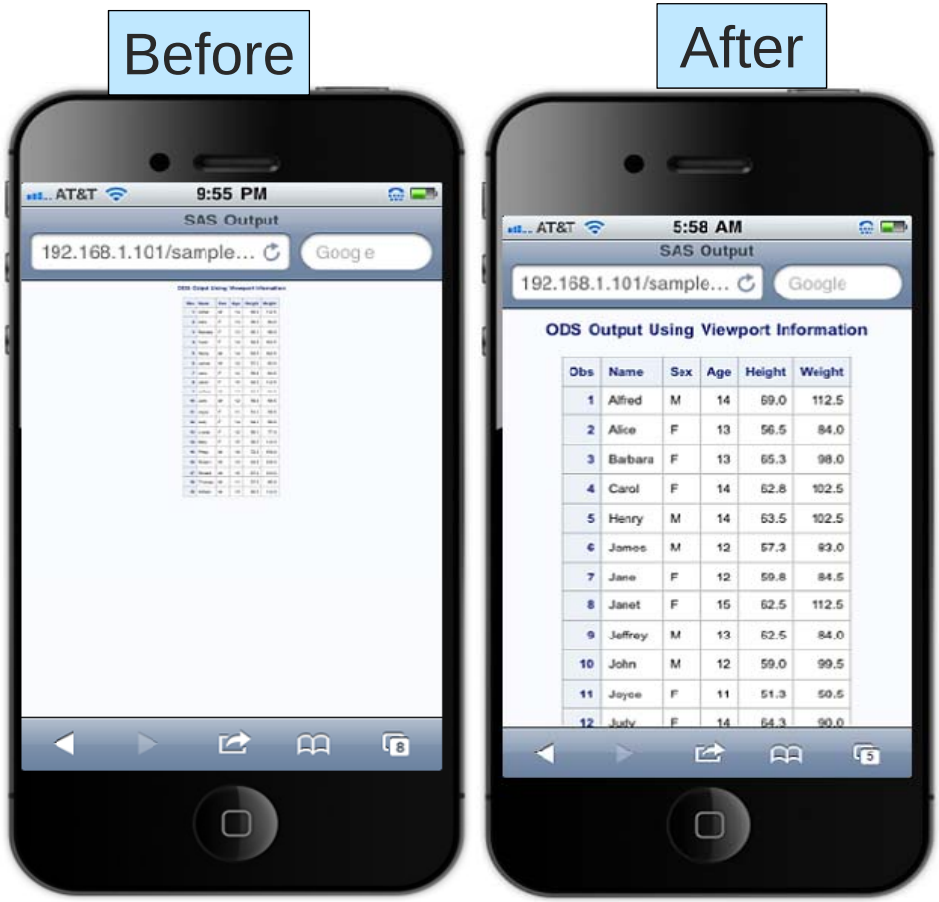
```
<meta name="viewport" content="device-width">
```

```
<meta name="viewport" content="initial-scale=1">
```



Viewport default width=980px

Optimizing Mobile Output *(continued)*

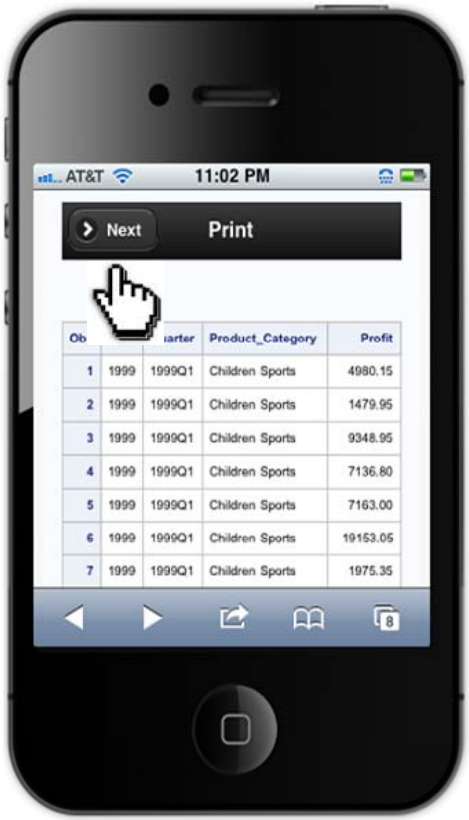



```
ods html file="temp.html"
         metatext='name="viewport"
         content="width=device-
                  width";

proc print data=sashelp.class;
   title "ODS Output Using
          Viewport Information";
run;

ods html close;
```

SAS® ODS Markup Language and jQuery Mobile Framework

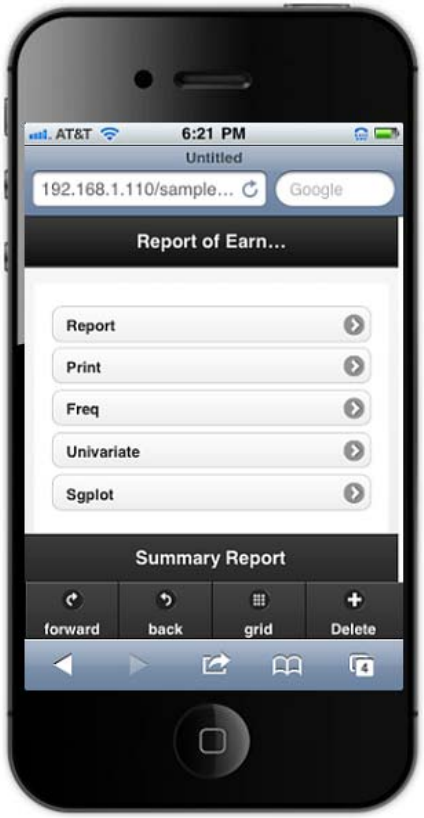
- The ODS markup language enables you to create customized output.
- ODS is the perfect tool to interface with the jQuery Mobile framework.
- An available sample ODS tagset (called jQueryMobile) contains features that drive the framework.
- Download the jQueryMobile tagset from **support.sas.com/rnd/base/ods/odsmarkup/index.html**.

jQueryMobile Tagset: Page Layout




```
ods tagsets.jQueryMobile file="c:\temp.html"

options(data_role="page");

 proc print data=sashelp.prdsale;
 run;

 proc report data=sashelp.class nowd;
 run;

 ods tagsets.jQueryMobile close;
```

jQueryMobile Tagset: Collapsible Layout

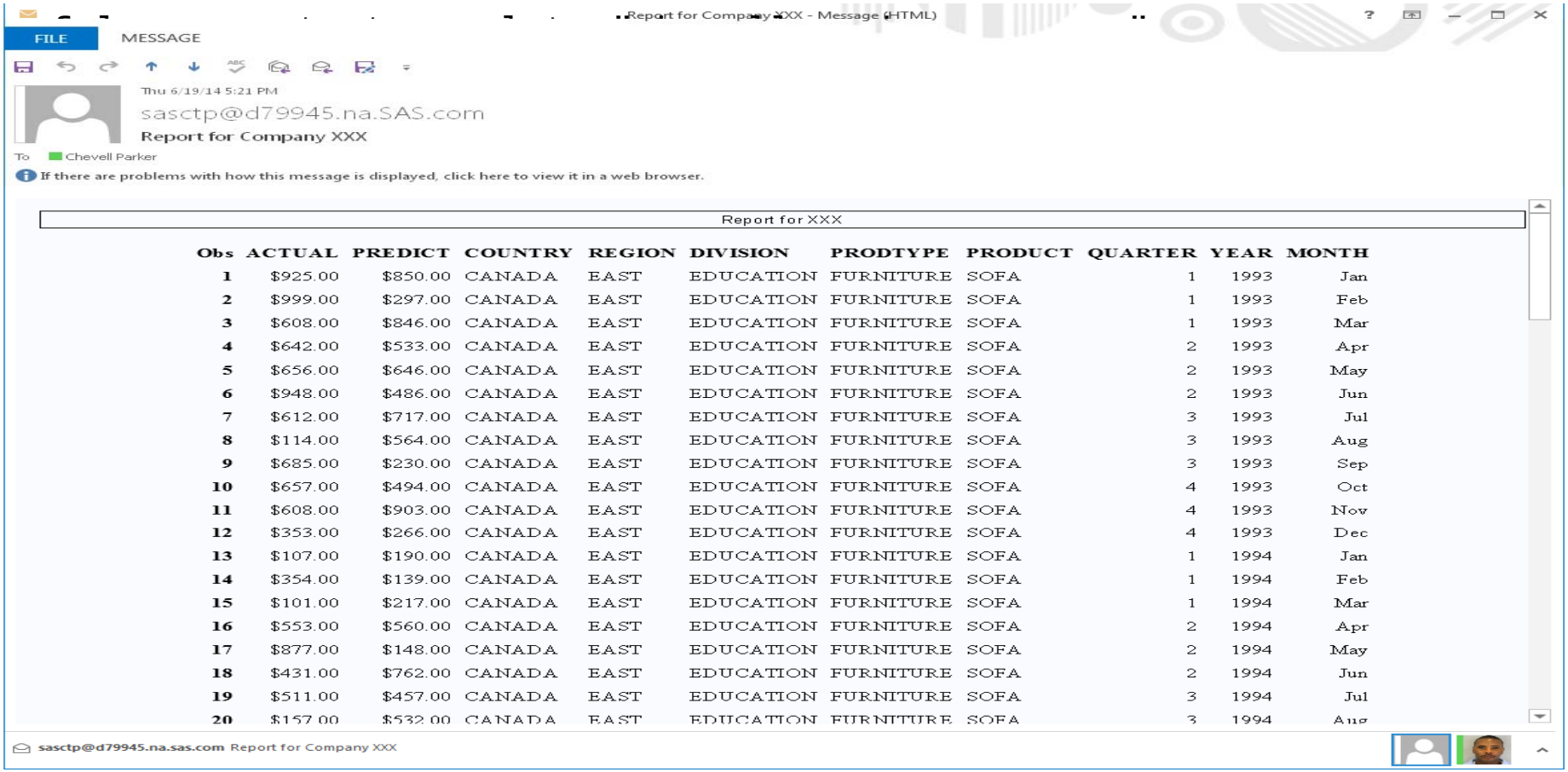



```
ods tagsets.jQueryMobile file="temp.html"
            options(data_role="collapsible"
                    header="Report Of Earnings"
                    footer="Summary Report"
                    data_mini="yes"
                    data_corners="yes"
                    data_iconpos="right"
                    data_expanded_icon="arrow-l"
                    data_collapsed_icon="arrow-r"
                    footer_icons="forward,back,grid,delete");

 proc report data=sashelp.prdsale nowd;
 run;

 proc print data=sashelp.prdsale noobs;;
 run;

 . . .more procedure steps . . .

 ods tagsets.jQueryMobile close;
```

Tips for Writing HTML to the Body of an Email

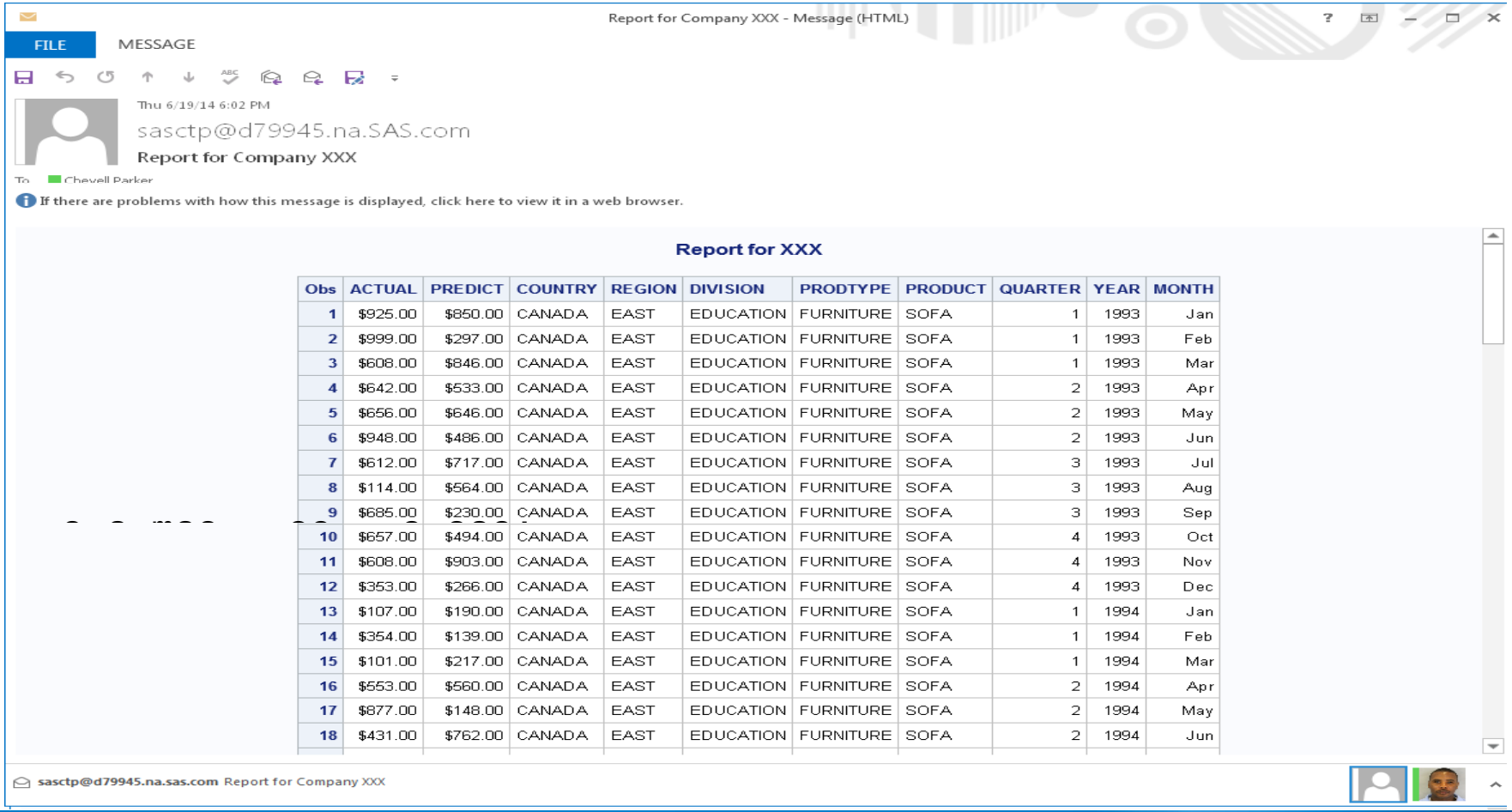
- The HTML destination provides an easy method of writing to the body of an email
- Microsoft Office Outlook uses rendering engine from Word to display HTML
- Is an easy way to communicate information in a formatted manner
- There are limitations with the presentation of the output
- The -EMAILSYS and –EMAILHOST options are required and should be set to SMTP and the name of the email server respectively
- The CSS specified in the HTML file may be ignored
- The MSOffice2K or HTML3 destinations may allow for a better presentation

Tips for Writing HTML to the Body of an Email



Obs	ACTUAL	PREDICT	COUNTRY	REGION	DIVISION	PRODTYPE	PRODUCT	QUARTER	YEAR	MONTH
1	$925.00	$850.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1993	Jan
2	$999.00	$297.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1993	Feb
3	$608.00	$846.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1993	Mar
4	$642.00	$533.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1993	Apr
5	$656.00	$646.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1993	May
6	$948.00	$486.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1993	Jun
7	$612.00	$717.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	3	1993	Jul
8	$114.00	$564.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	3	1993	Aug
9	$685.00	$230.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	3	1993	Sep
10	$657.00	$494.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	4	1993	Oct
11	$608.00	$903.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	4	1993	Nov
12	$353.00	$266.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	4	1993	Dec
13	$107.00	$190.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1994	Jan
14	$354.00	$139.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1994	Feb
15	$101.00	$217.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1994	Mar
16	$553.00	$560.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1994	Apr
17	$877.00	$148.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1994	May
18	$431.00	$762.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1994	Jun
19	$511.00	$457.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	3	1994	Jul
20	$157.00	$532.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	3	1994	Aug

Tips for Writing HTML to the Body of an Email



Report for XXX

Obs	ACTUAL	PREDICT	COUNTRY	REGION	DIVISION	PRODTYPE	PRODUCT	QUARTER	YEAR	MONTH
1	$925.00	$850.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1993	Jan
2	$999.00	$297.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1993	Feb
3	$608.00	$846.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1993	Mar
4	$642.00	$533.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1993	Apr
5	$656.00	$646.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1993	May
6	$948.00	$486.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1993	Jun
7	$612.00	$717.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	3	1993	Jul
8	$114.00	$564.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	3	1993	Aug
9	$685.00	$230.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	3	1993	Sep
10	$657.00	$494.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	4	1993	Oct
11	$608.00	$903.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	4	1993	Nov
12	$353.00	$266.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	4	1993	Dec
13	$107.00	$190.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1994	Jan
14	$354.00	$139.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1994	Feb
15	$101.00	$217.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	1	1994	Mar
16	$553.00	$560.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1994	Apr
17	$877.00	$148.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1994	May
18	$431.00	$762.00	CANADA	EAST	EDUCATION	FURNITURE	SOFA	2	1994	Jun

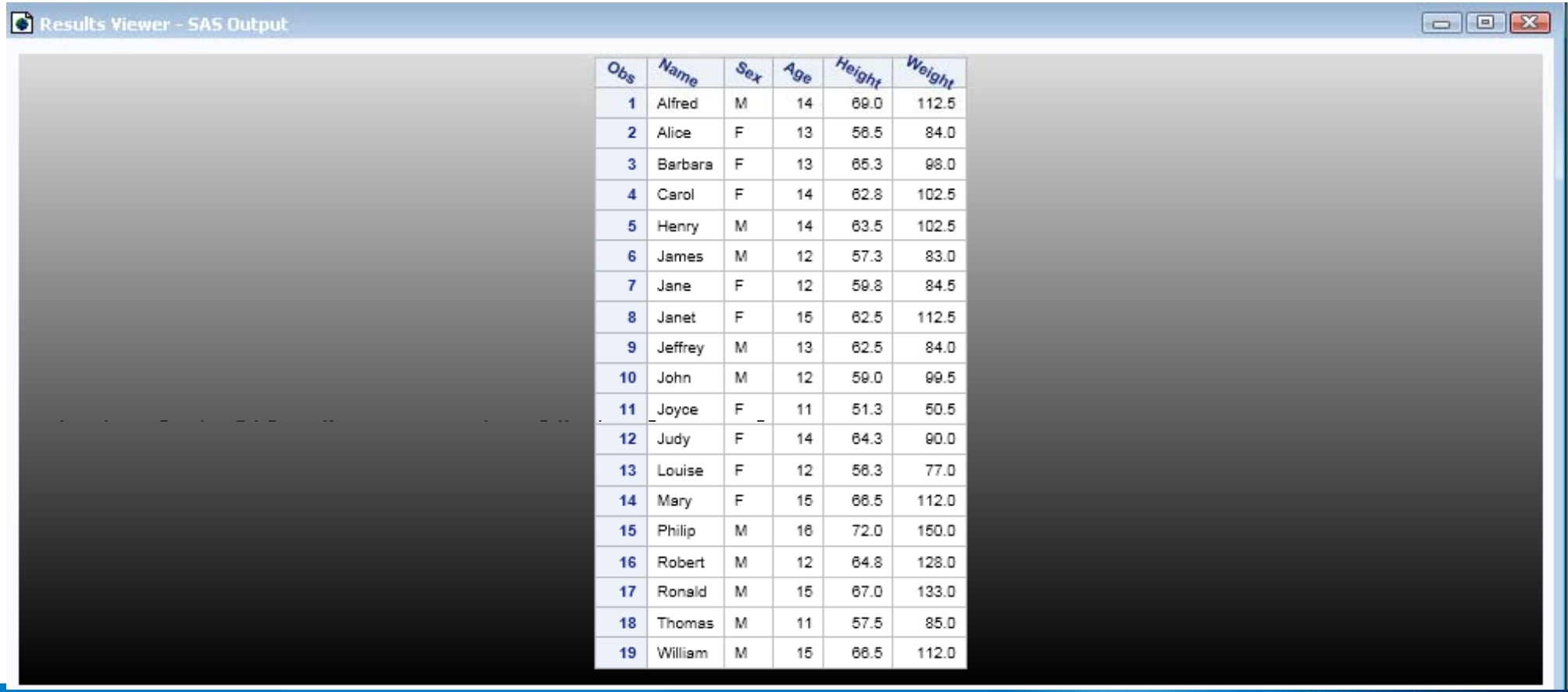
The TableEditor Tagset

- Creates web applications based on options passed
- Sorts and filters values along with freezing columns headers
- Creates the ability to add tabs to the web page
- Has an export feature export data to Excel

The New HTML5 Standard

- HTML5 is still a work in progress, but many browsers support parts of it.
- HTML5 was created to overcome the limitations of HTML and XHTML.
- This standard reduces the need for third-party tools and JavaScript.
- The standard is promoted by companies such as Google and Apple.
- New HTML5 features are based on HTML, CSS, the document object model (DOM), and JavaScript.
- HTML5 revolutionizes the way web pages are used.

Doing more with the new HTML5 Destination

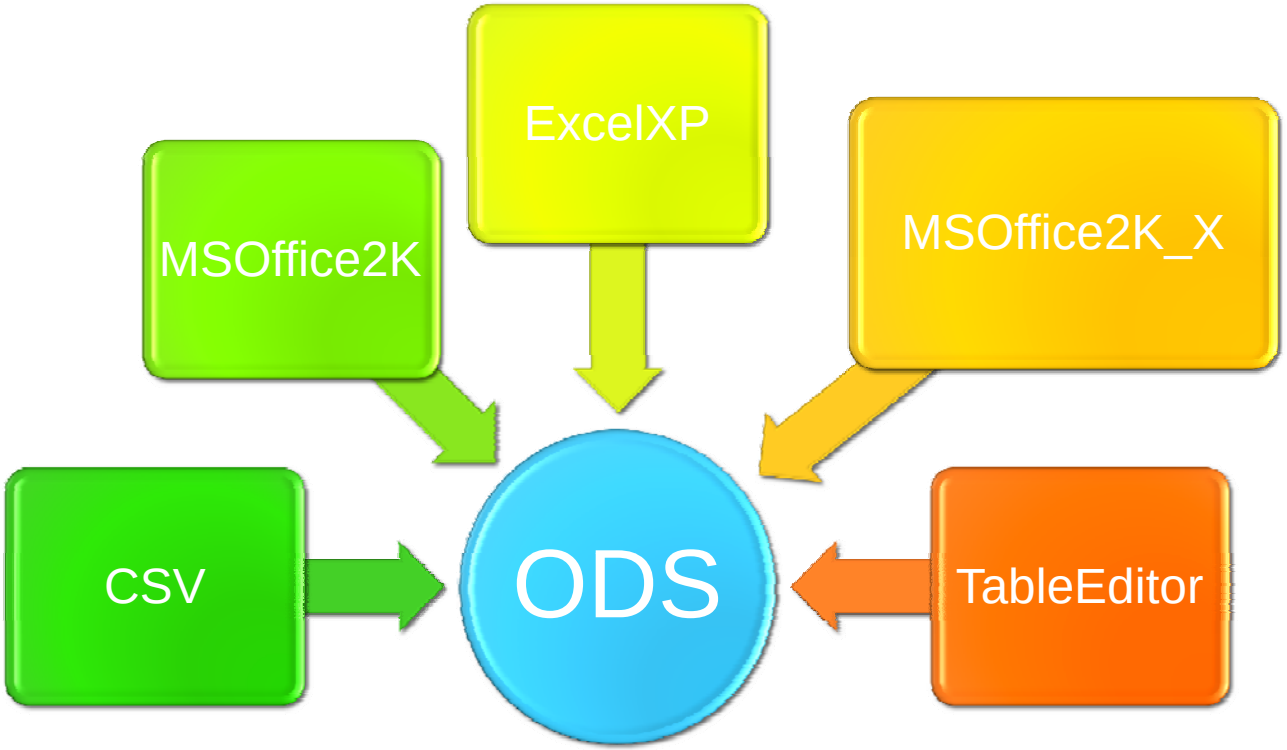


Obs	Name	Sex	Age	Height	Weight
1	Alfred	M	14	69.0	112.5
2	Alice	F	13	56.5	84.0
3	Barbara	F	13	65.3	98.0
4	Carol	F	14	62.8	102.5
5	Henry	M	14	63.5	102.5
6	James	M	12	57.3	83.0
7	Jane	F	12	59.8	84.5
8	Janet	F	15	62.5	112.5
9	Jeffrey	M	13	62.5	84.0
10	John	M	12	59.0	99.5
11	Joyce	F	11	51.3	50.5
12	Judy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

Exporting to Microsoft Excel Using ODS)

- Methods of exporting to Excel using ODS
- Enhancements for pivot tables and charts using ODS
- Preserving number formatting while exporting to Excel

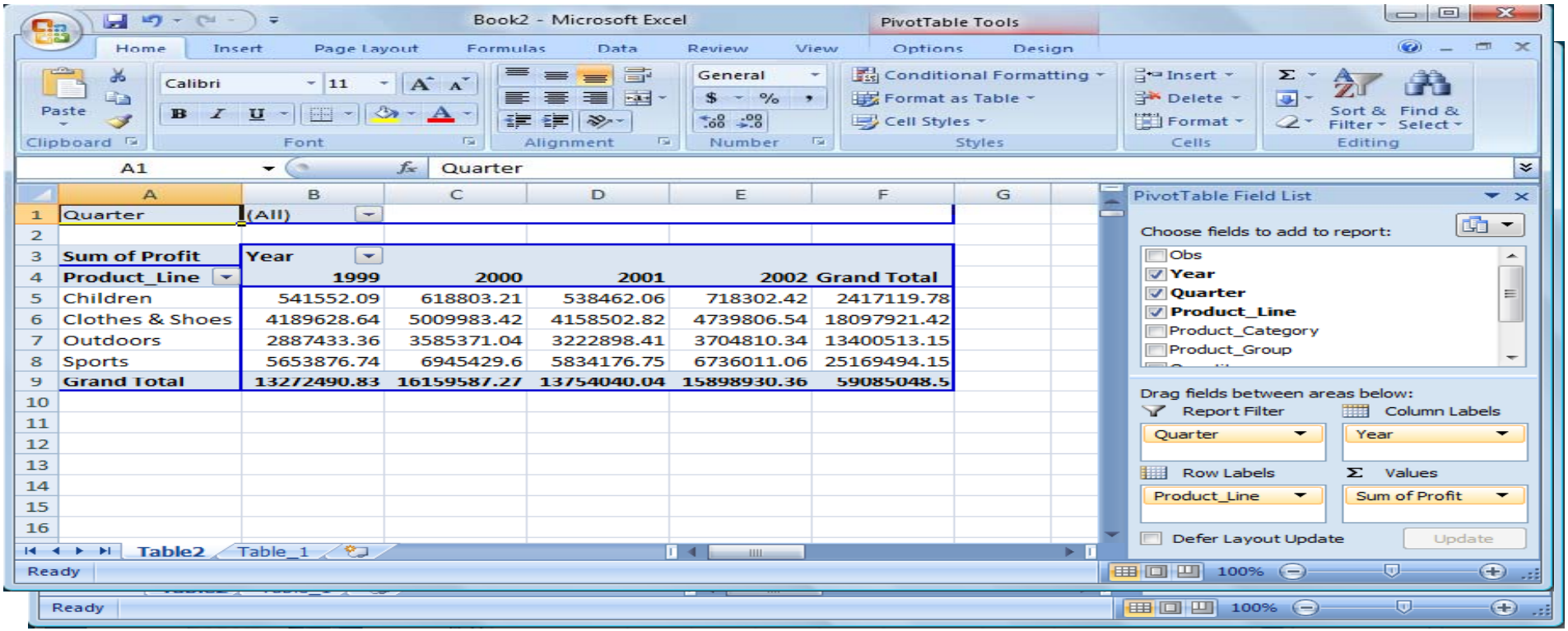
ODS Destinations used to Export to Excel



Enhancements for Pivot Tables Creation

- Create visual displays of data within a column
- Create new columns or modify existing columns based on formulas
- Create multiple statistic for a single column
- Automate pivot table creation

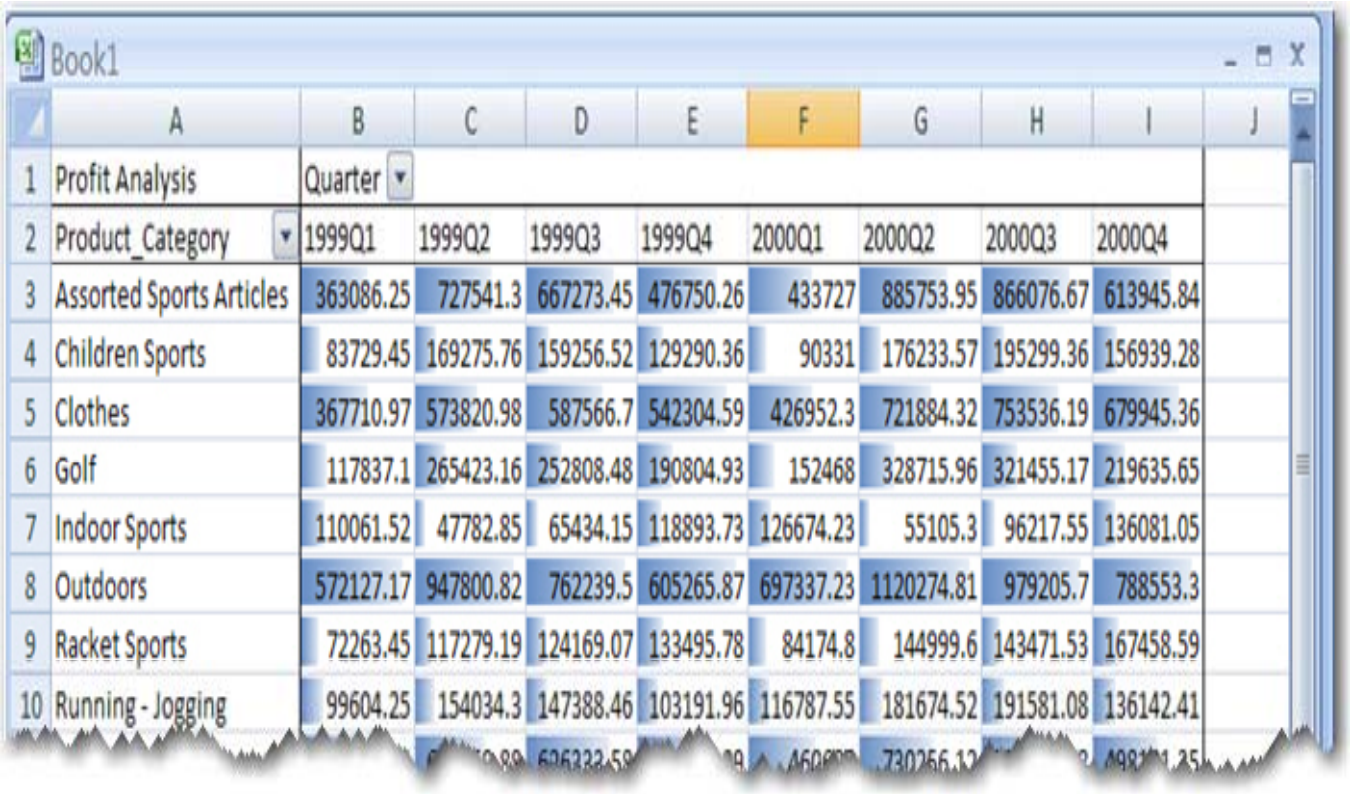
The Need for Excel Pivot Tables



Exporting Microsoft Excel Pivot Tables That Contain Visual Displays

```
ods tagsets.tableeditor file="temp.html"
                        options(format_condition="databar,2-9"
                                pivotrow="product_category"
                                pivotcol="quarter"
                                pivotdata="profit"
                                pivotdata_caption="Profit Analysis"
                                pivot_grandtotal="no");
proc print data=sashelp.orsales;
   where quarter in("1999Q1","1999Q2","1999Q3","1999Q4",
                    "2000Q1","2000Q2","2000Q3","2000Q4");
run;

ods tagsets.tableeditor close;
```

Exporting Microsoft Excel Pivot Tables That Contain Visual Displays (continued)

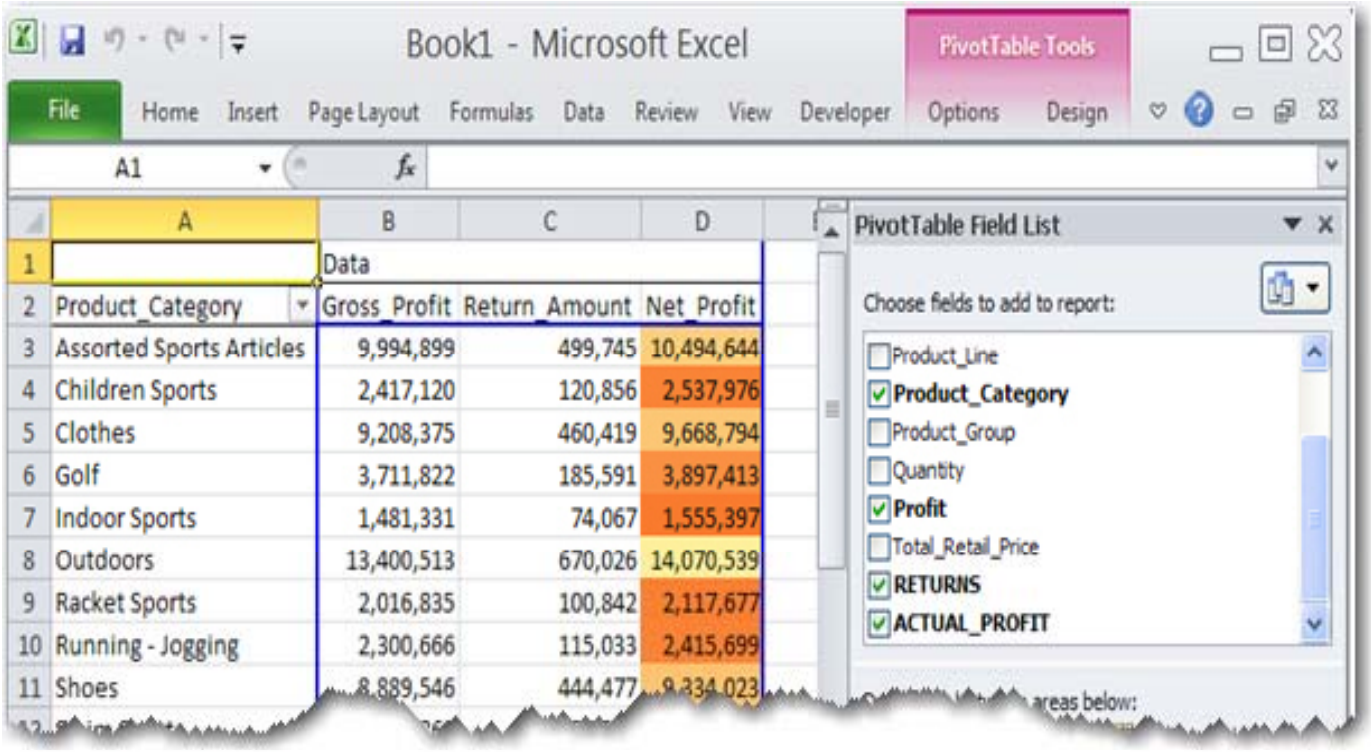


	A	B	C	D	E	F	G	H	I	J
1	Profit Analysis	Quarter								
2	Product_Category	1999Q1	1999Q2	1999Q3	1999Q4	2000Q1	2000Q2	2000Q3	2000Q4	
3	Assorted Sports Articles	363086.25	727541.3	667273.45	476750.26	433727	885753.95	866076.67	613945.84	
4	Children Sports	83729.45	169275.76	159256.52	129290.36	90331	176233.57	195299.36	156939.28	
5	Clothes	367710.97	573820.98	587566.7	542304.59	426952.3	721884.32	753536.19	679945.36	
6	Golf	117837.1	265423.16	252808.48	190804.93	152468	328715.96	321455.17	219635.65	
7	Indoor Sports	110061.52	47782.85	65434.15	118893.73	126674.23	55105.3	96217.55	136081.05	
8	Outdoors	572127.17	947800.82	762239.5	605265.87	697337.23	1120274.81	979205.7	788553.3	
9	Racket Sports	72263.45	117279.19	124169.07	133495.78	84174.8	144999.6	143471.53	167458.59	
10	Running - Jogging	99604.25	154034.3	147388.46	103191.96	116787.55	181674.52	191581.08	136142.41	

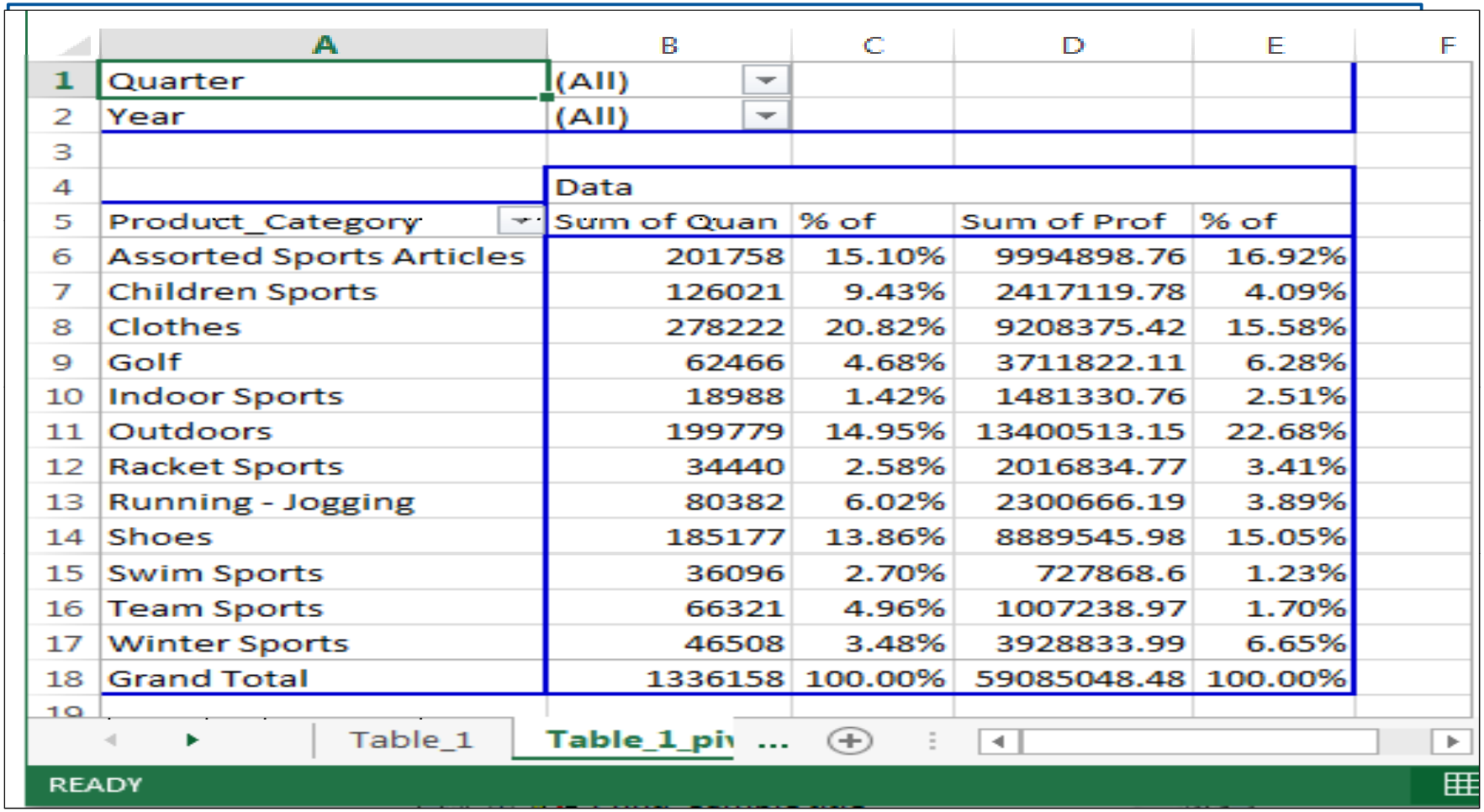
Adding Computed Fields to Pivot Tables

```
ods tagsets.tableeditor file="temp.html"
     options(addfield="Returns =Profit*.05,Actual_profit =Profit*1.05"
             pivotdata="Profit,returns,actual_profit"
             pivotrow="product_category"
             pivotdata_fmt="#,###,##"
             pivotdata_caption="Gross_Profit,Return_Amount,Net_Profit"
             pivotdata_tocolumns="yes"
             format_condition=",colorscale,4"
             pivot_grandtotal="no");

proc print data=sashelp.orsales;
run;

ods tagsets.tableeditor close;
```

Adding Computed Fields to Pivot Tables (continued)



Automate Pivot Table Creation



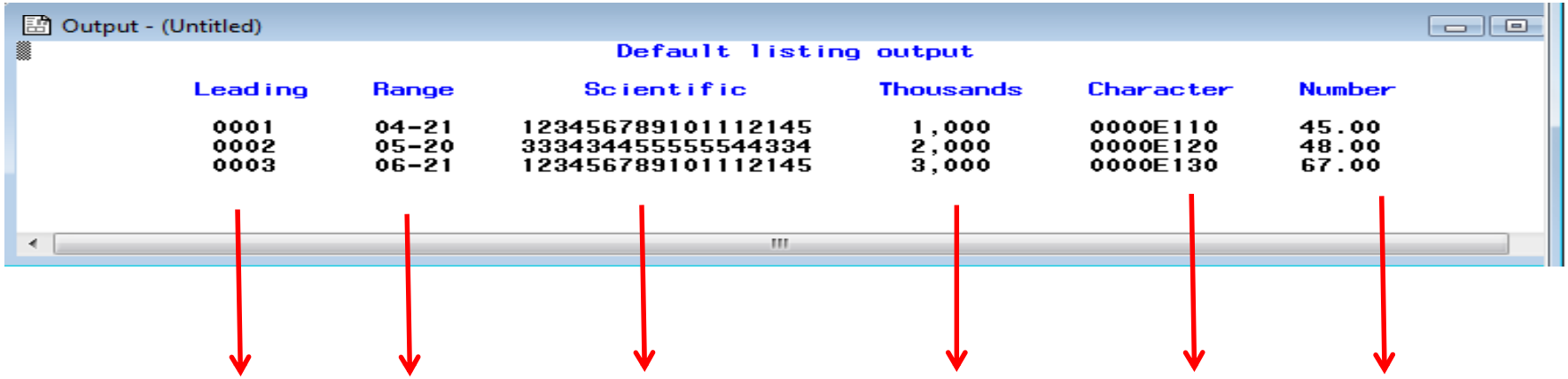
	A	B	C	D	E	F
1	Quarter	(All)				
2	Year	(All)				
3						
4		Data				
5	Product_Category	Sum of Quan	% of	Sum of Prof	% of	
6	Assorted Sports Articles	201758	15.10%	9994898.76	16.92%	
7	Children Sports	126021	9.43%	2417119.78	4.09%	
8	Clothes	278222	20.82%	9208375.42	15.58%	
9	Golf	62466	4.68%	3711822.11	6.28%	
10	Indoor Sports	18988	1.42%	1481330.76	2.51%	
11	Outdoors	199779	14.95%	13400513.15	22.68%	
12	Racket Sports	34440	2.58%	2016834.77	3.41%	
13	Running - Jogging	80382	6.02%	2300666.19	3.89%	
14	Shoes	185177	13.86%	8889545.98	15.05%	
15	Swim Sports	36096	2.70%	727868.6	1.23%	
16	Team Sports	66321	4.96%	1007238.97	1.70%	
17	Winter Sports	46508	3.48%	3928833.99	6.65%	
18	Grand Total	1336158	100.00%	59085048.48	100.00%	
19						

Table_1 | Table_1_piv ... | READY

Cell Formatting Issues Exporting to Excel

- Leading and trailing zeroes are omitted in numbers.
- Numbers larger than 13 digits are displayed in scientific notation.
- The SAS COMMA format might not be maintained.
- Numeric values longer than 15 digits lose precision.
- Values that contain dashes might display as Excel dates.
- The SAS DOLLAR format might be treated as text.

Cell Formatting Issues Exporting to Excel



Leading	Range	Scientific	Thousands	Character	Number
1	21-Apr	1.23457E+17	1000	0.00E+00	45
2	20-May	3.33434E+17	2000	0.00E+00	48
3	21-Jun	1.23457E+17	3000	0.00E+00	67

Cell Formatting Issues Exporting to Excel: Custom Operators

Character	Description
0	Pads the value with zeros.
#	Does not display extra zeros.
?	Leaves a space for insignificant zeros.
. (period)	Displays decimal number.
%	Multiplies by 100 and displays the value as a percentage.
, (comma)	Uses a thousands separator.
Text Code	**Description**
character	Displays the character that you specify.
"text"	Displays the value as text.
*	Repeats a character to fill the format.
_ (underscore)	Skips the width of the next character.
@	Is a text placeholder.
Date Code	**Description**
M/D/YYYY	Formats a data as Month/Day/Year.
Miscellaneous	**Description**
[BLACK], [BLUE],…[COLOR *n*]	Display the characters in the specified colors. *n* is a value from 1 to 56 .

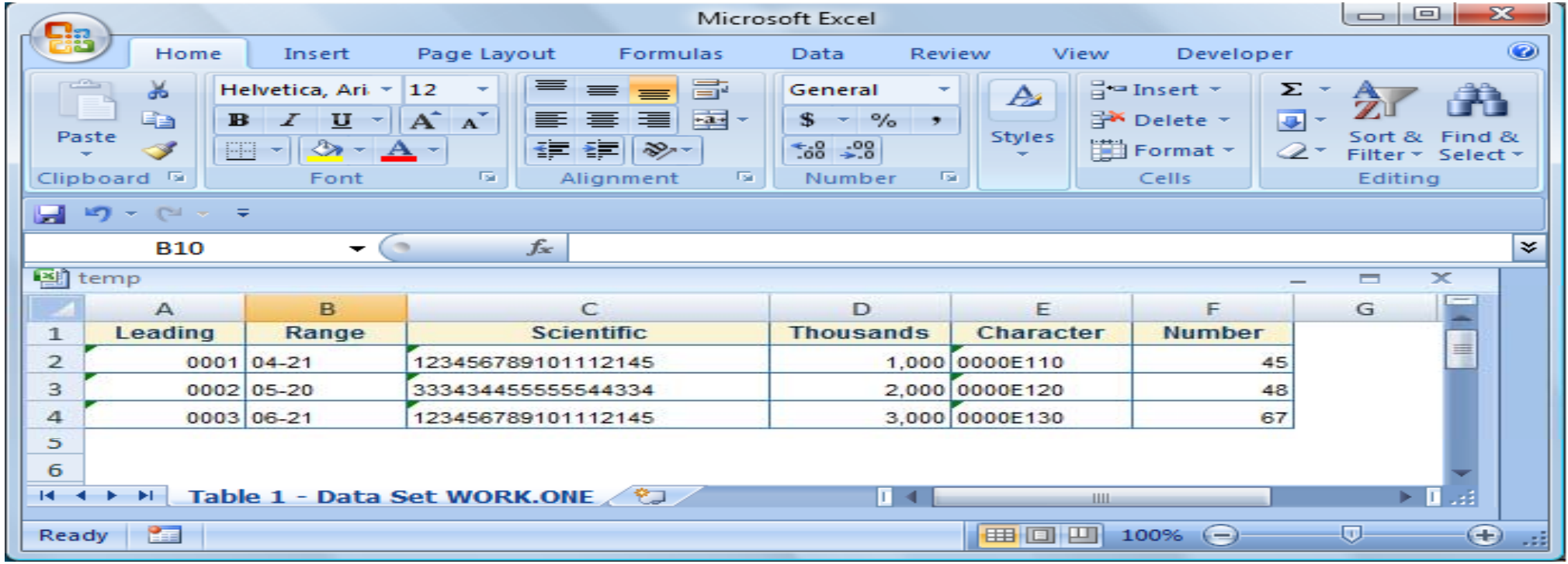
Cell Formatting Issues Exporting to Excel

Destination	Attribute	Parameter	Excel Version
ExcelXP	TAGATTR=	format:	Excel 2002 +
MSOffice2K/ MSOffice2K_x	HTMLSTYLE=	mso-number-format:	Excel 2000 +
TableEditor	HTMLSTYLE/ HTMLCLASS	mso-number-format:	Excel 97+
CSV	N/A		

Cell Formatting Issues Exporting to Excel

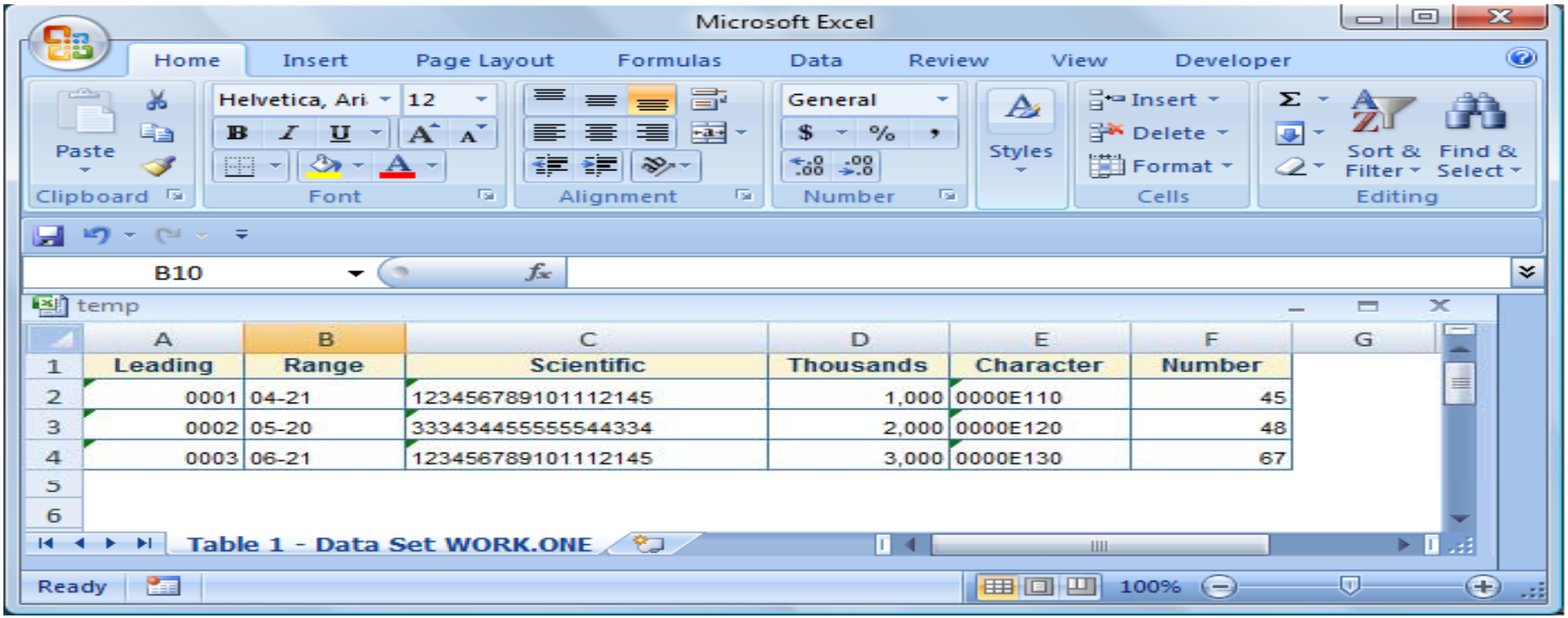
```
ods tagsets.excelxp file="temp.xls" style=normal;

proc print data=one;
   format leading z4.;
   var leading /     style(data)={tagattr="format:@"};
   var range   /     style(data)={tagattr="format:@"};
   var scientific /  style(data)={tagattr="type:String"};
   var thousands  /  style(data)={tagattr="format:#,###"};
   var character  /  style(data)={tagattr="format:@"};
   var number     /  style(data)={tagattr="format:##"};

run;

ods tagsets.excelxp close;
```

Cell Formatting Issues Exporting to Excel



	A	B	C	D	E	F	G
1	Leading	Range	Scientific	Thousands	Character	Number	
2	0001	04-21	123456789101112145	1,000	0000E110	45	
3	0002	05-20	333434455555544334	2,000	0000E120	48	
4	0003	06-21	123456789101112145	3,000	0000E130	67	
5							
6							

Preserving Cell Formatting Based on Data Type

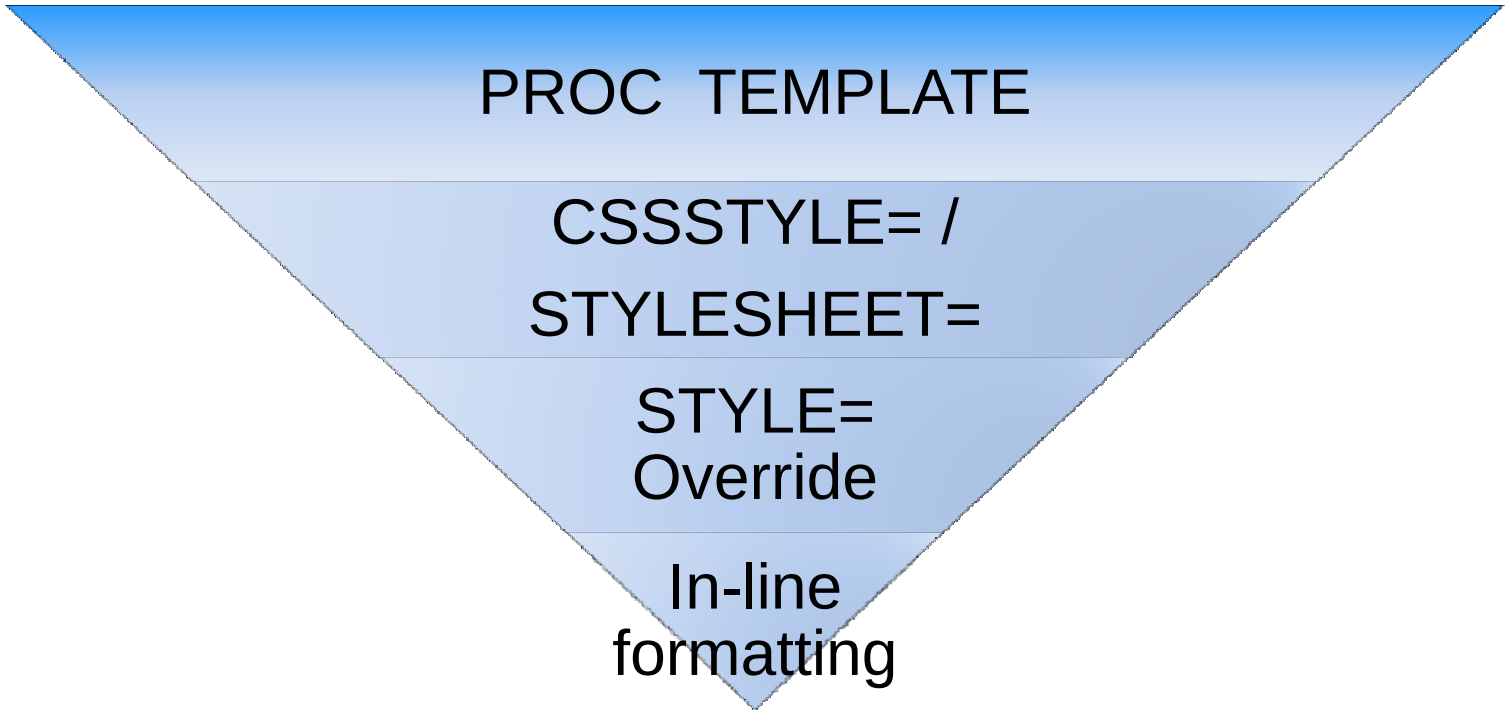


	A	B	C	D	E	F	G
1	Leading	Range	Scientific	Thousands	Character	Number	
2	0001	04-21	123456789101112145	1,000	0000E110	45	
3	0002	05-20	333434455555544334	2,000	0000E120	48	
4	0003	06-21	123456789101112145	3,000	0000E130	67	
5							
6							

Enhancing Reports using Styles and other ODS Tools

- Using Cascading Style Sheets with ODS
- Enhancing reports using ODS Layout and the Report Writing Interface
- Creating Zip files using ODS

Methods of Creating and Modifying Styles Using ODS



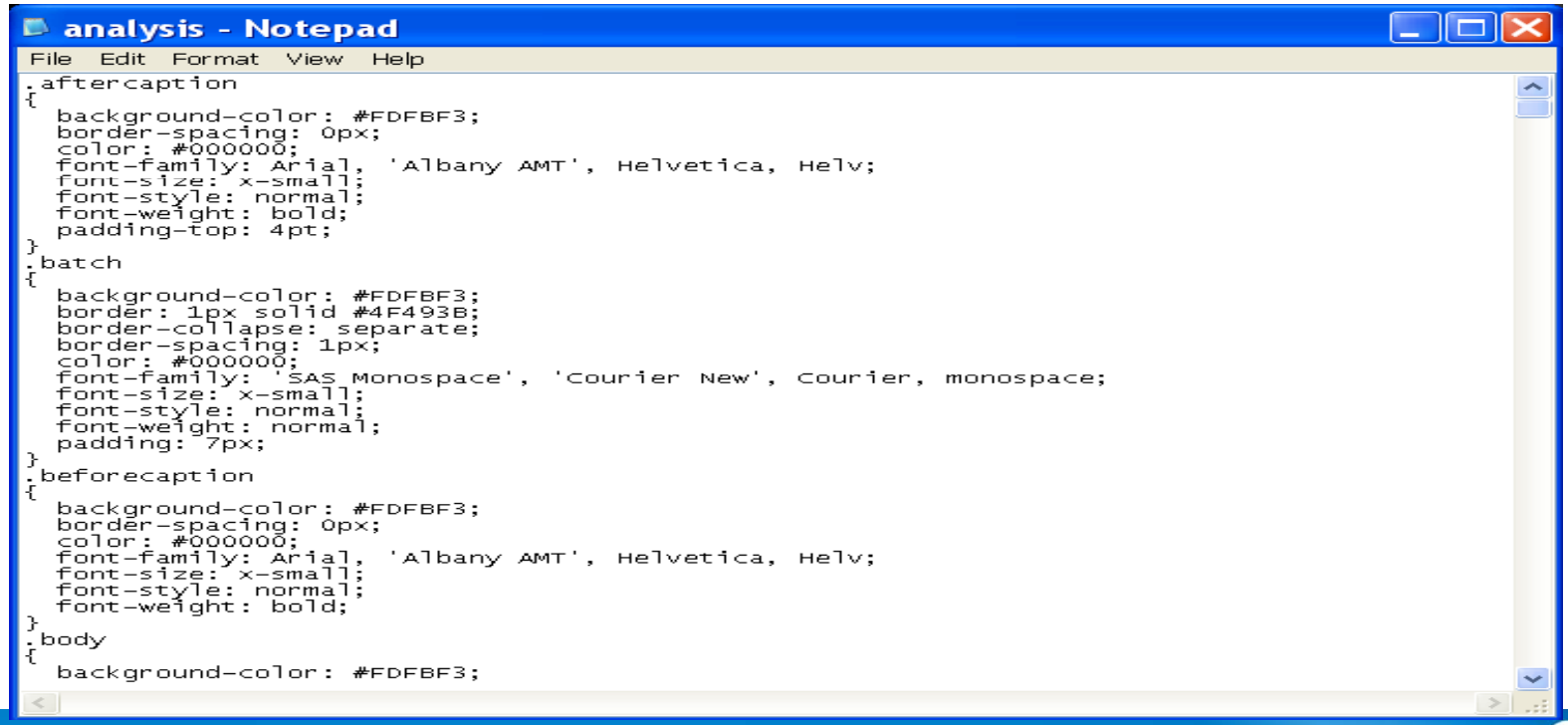
Cascading Style Sheets and ODS

- There are three types of CSS styles: internal (embedded), external, and inline.
- The HTML and HTML5 ODS destinations use internal style sheets by default.
- External style sheets are stored externally as a separate file.
- The CSSSTYLE= option applies CSS for formatting with most ODS destinations
- Allows advanced formatting which was not possible template styles
- The TEMPLATE procedure fully supports the use of CSS files.

Cascading Style Sheets: Basics *(continued)*

You can use any SAS® template style to create a CSS file.

```
ods html stylesheet='c:\analysis.css' style=styles.analysis;
```



CSS Style Sheets: Basics *(continued)*

CSS Style Selectors

- In CSS, *style selectors* are patterns that are used to select specific elements to which you want to add styles.
- There are four basic selector types:
  - class selectors
  - type selectors
  - ID selectors
  - Attribute
  - Pseudo-Class

CSS Declaration with Selectors

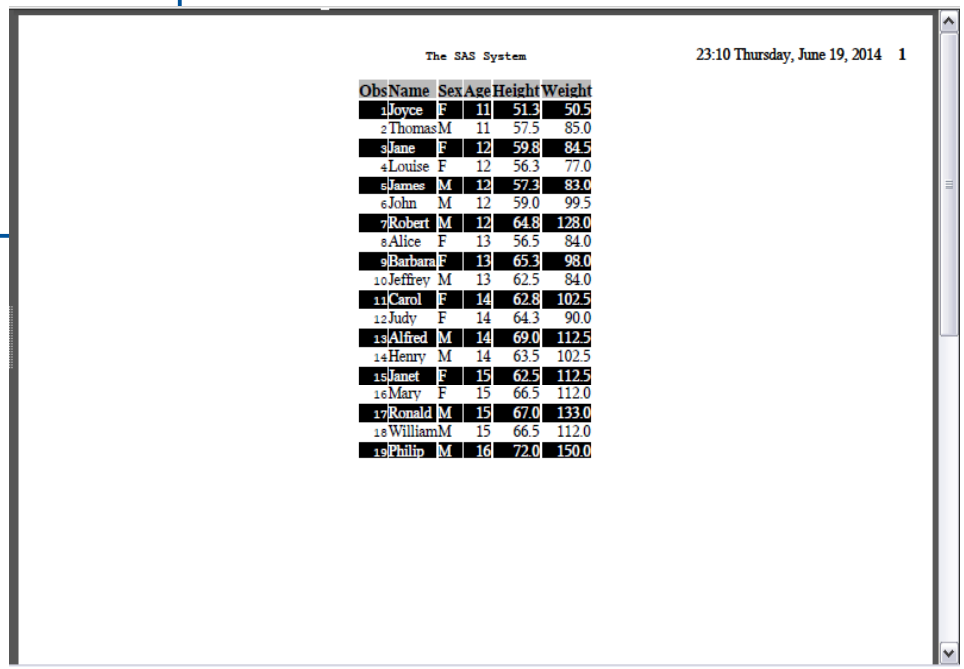
```
.data {color: red;
       background-color: #808080;
       font-size: 12px;
       font-style: italic;
       font-weight:bold
      }
 h1   {color:red;
       font-style:italic;
      }
#item {position:relative;
       color:red;
       font-size:10px;
      }
```

CSS Style Sheets: Pseudo-class Selector

```
.table tbody tr:nth-child(even) td {
background-color: white;
color: black;
}
.table tbody tr:nth-child(odd) td {
background-color: black;
color: white;
}
```

CSS Style Sheets: Pseudo-class Selector (continued)

```
ods pdf file="c:\temp3.pdf" cssstyle="c:\printer.css";

proc print data=sashelp.class;
run;

ods pdf close;
```



The SAS System 23:10 Thursday, June 19, 2014 1

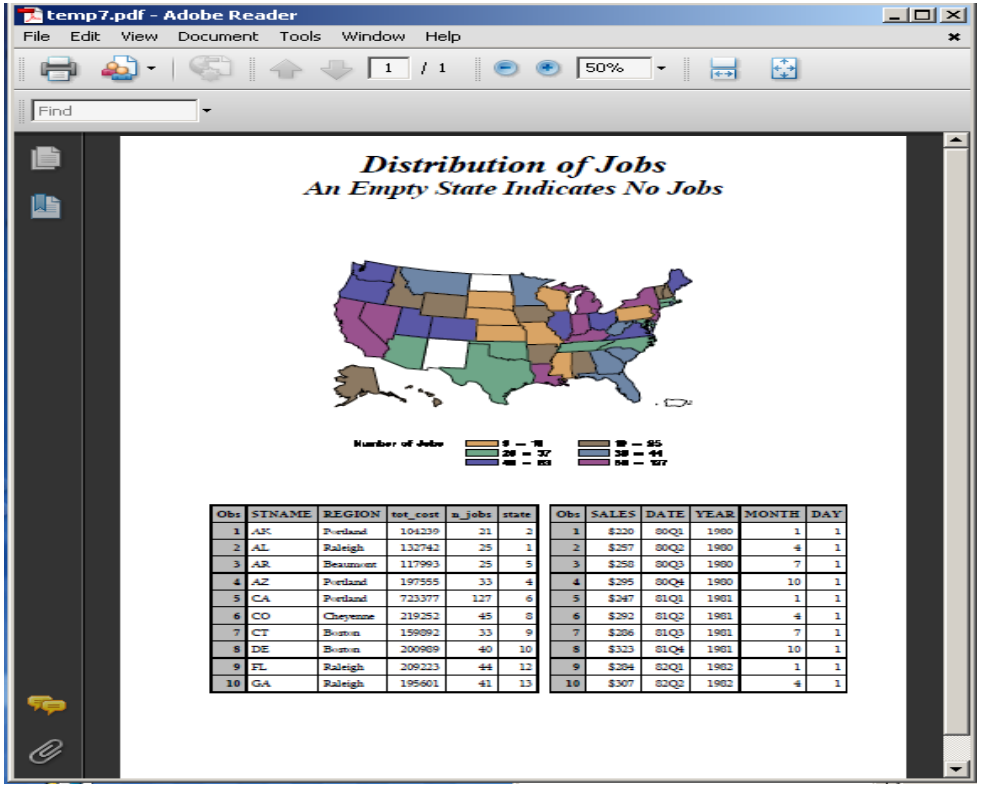
Obs	Name	Sex	Age	Height	Weight
1	Joyce	F	11	51.3	50.5
2	Thomas	M	11	57.5	85.0
3	Jane	F	12	59.8	84.5
4	Louise	F	12	56.3	77.0
5	James	M	12	57.3	83.0
6	John	M	12	59.0	99.5
7	Robert	M	12	64.8	128.0
8	Alice	F	13	56.5	84.0
9	Barbara	F	13	65.3	98.0
10	Jeffrey	M	13	62.5	84.0
11	Carol	F	14	62.8	102.5
12	Judy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

Enhancing Reporting using ODS Layout

- Enables output to be placed specifically on a page
- Is good for emulating specific type of reports
- Creates both gridded and absolute layouts
- Defined by one or more regions

Enhancing Reporting using ODS Layout-Absolute

```
ods layout  start width=8in height=10in;
ods region x=2in y=.5in width=6in…;
proc  gmap …

ods region x=.5in y=3in width=4in…;
proc print….

ods region x=4in y=3in  width=4in…;
proc print…

ods layout end;
```

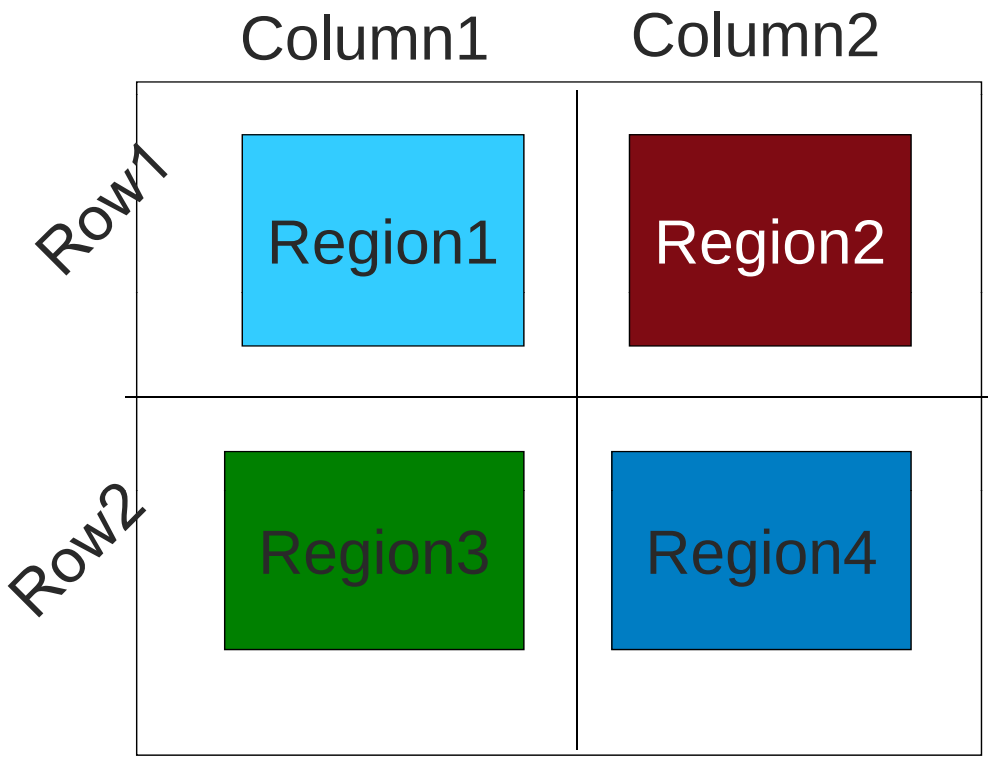


Obs	STNAME	REGION	tot_cost	n_jobs	state
1	AK	Portland	104239	21	2
2	AL	Raleigh	132742	25	1
3	AR	Beaumont	117993	25	5
4	AZ	Portland	197555	33	4
5	CA	Portland	723377	127	6
6	CO	Cheyenne	219252	45	8
7	CT	Boston	159892	33	9
8	DE	Boston	200989	40	10
9	FL	Raleigh	209223	44	12
10	GA	Raleigh	195601	41	13

Obs	SALES	DATE	YEAR	MONTH	DAY
1	$220	80Q1	1980	1	1
2	$257	80Q2	1980	4	1
3	$258	80Q3	1980	7	1
4	$295	80Q4	1980	10	1
5	$247	81Q1	1981	1	1
6	$292	81Q2	1981	4	1
7	$286	81Q3	1981	7	1
8	$323	81Q4	1981	10	1
9	$284	82Q1	1982	1	1
10	$307	82Q2	1982	4	1

Enhancing Reporting using ODS Layout-Gridded

```
ods layout start columns=2 rows=2;

ods region;
proc print data=class;run;

ods region;
proc print data=fitness;run;

ods region;
proc print data=orsales;run;

ods region;
proc print data=prdsale;run;

ods layout end;
```



Generating Zip Archives with ODS Packages

```
ods package open nopf;
ods tagsets.excelxp file="c:\temp.xml" package;

proc print data=sashelp.class;
run;

ods tagsets.excelxp close;
ods package publish archive
    properties(archive_name="Example.zip"
               archive_path="c:\");
ods package close;
```

Contact Information

Email: Chevell.Parker@sas.com

Resources

"Cascading Style Sheets." World Wide Web Consortium. Available at http://www.w3.org/Style/CSS/.

ftp://ftp.sas.com/techsup/download/base/illinois_examples.ZIP.

"ODS Markup"
http://support.sas.com/rnd/base/ods/odsmarkup/index.html

www.SAS.com