

# PROC REPORT by Example

Techniques for Building  
Professional Reports Using SAS®



Lisa Fine



From *PROC REPORT by Example*. Full book available for purchase [here](#).

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## **Chapter 9: Using PROC REPORT to Obtain Summary Statistics for Comparison**

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## Introduction

A number of summary statistics can be obtained with the REPORT procedure. To mention just a few, we can obtain counts, percentages, means, standard deviations, medians (50<sup>th</sup> percentile), 25<sup>th</sup> and 75<sup>th</sup> percentiles, and minimum and maximum values. Once we have these statistics, additional analyses such as comparisons of individual records to summary statistics can be performed using COMPUTE blocks.

---

## Example: Vehicle MSRP Comparison Report

A report is produced to summarize Manufacturer's Suggested Retail Price (MSRP) for vehicles by continent of origin (Asia, Europe, and USA) and vehicle type (e.g., SUV, Sedan, Sport). Statistics including quartiles and minimum and maximum MSRP for each Continent-Vehicle Type group are obtained. Within each continent and vehicle type, individual vehicle MRSPs are compared to the group statistics to determine which pricing category the vehicle falls within (e.g., which percentile). Specific report features include:

- Above each Continent-Vehicle Type table, the percentiles and the lowest (minimum) and highest (maximum) MSRP are reported.
- The individual vehicles that represent the highest and lowest priced vehicles within Origin-VehicleType are highlighted (shaded) within the table cells (see "MSRP" column).
- A report column, titled "MSRP Price Point" displays \$ symbols to express the price rating of each vehicle, with a single "\$" representing the lowest priced vehicles (25<sup>th</sup> percentile) and "\$\$\$\$" representing the highest priced vehicles (> 75<sup>th</sup> percentile).

Figure 9.1 displays an example page of the report.

Figure 9.1 Partial Print of MSRP Report

**Continent of Origin: USA**  
**Vehicle Type: SUV**

SUV MSRP Price Point					
MSRP <=25th Percentile (\$26,545) (\$)					
MSRP <=50th Percentile (\$32,235) (\$\$)					
MSRP <=75th Percentile (\$42,735) (\$\$\$)					
MSRP > 75th Percentile (\$42,735) (\$\$\$\$)					
■ Lowest MSRP: \$20,130					
■ Highest MSRP: \$52,795					
Make	Model	Cylinders	Horsepower	MSRP	MSRP Price Point
Buick	Rendezvous CX	6	185	\$26,545	\$
	Rainier	6	275	\$37,895	\$\$\$
Cadillac	SRX V8	8	320	\$46,995	\$\$\$\$
	Escalade	8	295	\$52,795	\$\$\$\$
Chevrolet	Tracker	6	165	\$20,255	\$
	TrailBlazer LT	6	275	\$30,295	\$\$
	Tahoe LT	8	295	\$41,465	\$\$\$
	Suburban 1500 LT	8	295	\$42,735	\$\$\$
Dodge	Durango SLT	8	230	\$32,235	\$\$
Ford	Escape XLS	6	201	\$22,515	\$
	Explorer XLT V6	6	210	\$29,670	\$\$
	Expedition 4.6 XLT	8	232	\$34,560	\$\$\$
	Excursion 6.8 XLT	10	310	\$41,475	\$\$\$
GMC	Envoy XUV SLE	6	275	\$31,890	\$\$
	Yukon 1500 SLE	8	285	\$35,725	\$\$\$
	Yukon XL 2500 SLT	8	325	\$46,265	\$\$\$\$
Hummer	H2	8	316	\$49,995	\$\$\$\$
Jeep	Liberty Sport	4	150	\$20,130	\$
	Wrangler Sahara convertible 2dr	6	190	\$25,520	\$
	Grand Cherokee Laredo	6	195	\$27,905	\$\$
Lincoln	Aviator Ultimate	8	302	\$42,915	\$\$\$\$
	Navigator Luxury	8	300	\$52,775	\$\$\$\$
Mercury	Mountaineer	6	210	\$29,995	\$\$
Pontiac	Aztek	6	185	\$21,595	\$
Saturn	VUE	4	143	\$20,585	\$

## Goals for MSRP Comparison Report

The vehicle report uses behind-the-scenes steps to determine each vehicle's MSRP percentile category, as well as the minimum and maximum values. By "behind-the-scenes" we mean that these statistics are not printed in columns. They are used in COMPUTE blocks for comparison and are reported as summary information above the report for each vehicle type and as symbols and highlighted cells within columns.

---

### Key Steps

The REPORT procedure is run twice, with the first run performed simply for the purpose of obtaining a data set with needed statistics. This summary data set is merged back to the full data set so that comparisons to percentiles and the minimum and maximum MSRPs can be made on a record-by-record basis.

The second PROC REPORT produces the printed report. Several PROC REPORT options are used, including:

- The use of BY VARIABLES and placement of BY values in page titles
- The SPANROWS option for ORDER variables
- ALIASES for computing new variables and ordering rows
- Table of Contents options

---

## Source Data

The source data set is the SAS supplied data set SASHELP.CARS (2004 Car Data). Only the variables needed for this report are kept. Table 9.1 shows a partial print of the data, and Table 9.2 displays the variable attributes of the data set.

**Table 9.1 Partial Print of CARS Data**

Make	Model	Type	Origin	MSRP	Cylinders	Horsepower
Buick	Rainier	SUV	USA	\$37,895	6	275
Buick	Rendezvous CX	SUV	USA	\$26,545	6	185
Cadillac	Escalade	SUV	USA	\$52,795	8	295
Cadillac	SRX V8	SUV	USA	\$46,995	8	320
Chevrolet	Suburban 1500 LT	SUV	USA	\$42,735	8	295
Chevrolet	Tahoe LT	SUV	USA	\$41,465	8	295
Chevrolet	TrailBlazer LT	SUV	USA	\$30,295	6	275
Chevrolet	Tracker	SUV	USA	\$20,255	6	165
Dodge	Durango SLT	SUV	USA	\$32,235	8	230
Ford	Excursion 6.8 XLT	SUV	USA	\$41,475	10	310
Ford	Expedition 4.6 XLT	SUV	USA	\$34,560	8	232
Ford	Explorer XLT V6	SUV	USA	\$29,670	6	210
Ford	Escape XLS	SUV	USA	\$22,515	6	201
GMC	Envoy XUV SLE	SUV	USA	\$31,890	6	275
GMC	Yukon 1500 SLE	SUV	USA	\$35,725	8	285
GMC	Yukon XL 2500 SLT	SUV	USA	\$46,265	8	325
Hummer	H2	SUV	USA	\$49,995	8	316
Jeep	Grand Cherokee Laredo	SUV	USA	\$27,905	6	195
Jeep	Liberty Sport	SUV	USA	\$20,130	4	150
Jeep	Wrangler Sahara convertible 2dr	SUV	USA	\$25,520	6	190
Lincoln	Navigator Luxury	SUV	USA	\$52,775	8	300
Lincoln	Aviator Ultimate	SUV	USA	\$42,915	8	302
Mercury	Mountaineer	SUV	USA	\$29,995	6	210
Pontiac	Aztek	SUV	USA	\$21,595	6	185
Saturn	VUE	SUV	USA	\$20,585	4	143
Buick	Century Custom 4dr	Sedan	USA	\$22,180	6	175
Buick	LeSabre Custom 4dr	Sedan	USA	\$26,470	6	205
Buick	Regal LS 4dr	Sedan	USA	\$24,895	6	200
Buick	Regal GS 4dr	Sedan	USA	\$28,345	6	240

**Table 9.2 Contents of CARS Data**

#	Variable	Type	Len	Format
1	Make	Char	13	
2	Model	Char	40	
3	Type	Char	8	
4	Origin	Char	6	
5	MSRP	Num	8	DOLLAR8.
6	Cylinders	Num	8	
7	Horsepower	Num	8	

---

## ODS Style Template Used

HARVEST is the ODS Style template used to produce Figure 9.1.

---

## Programs Used

The name of the program used is Ch9Stat.sas.

---

## Implementation

### Initial PROC REPORT for Obtaining Statistics

The purpose of the first PROC REPORT is to obtain percentile statistics (25<sup>th</sup> percentile, median, and 75<sup>th</sup> percentile) and the minimum and maximum values for MSRP by continent of origin and by vehicle type. The statistics are saved to a data set named QUARTILES. This PROC REPORT data set is merged back to the original data set so that comparisons to percentiles and minimum and maximum values can be made on a record-by-record basis.

---

### Code for Obtaining Statistics

```
proc sort data=sashelp.cars(keep=Make Model Type Origin MSRP Cylinders
                        Horsepower)
                        OUT=CARS;
```

```

    by origin type; ❶
run;

proc report data=cars nowd OUT=QUARTILES; ❷
    column origin type msrp msrp=msrp2 msrp=msrp3 msrp=msrp4 msrp=msrp5;
❸
    define origin / group;
    define type / group;

    ** Define Statistics; ❹
    define msrp / p25;
    define msrp2 / median;
    define msrp3 / p75;
    define msrp4 / min;
    define msrp5 / max;

run;

data cars; ❺
    merge cars
        quartiles(rename=(msrp=per25 msrp2=per50 msrp3=per75
            msrp4=pmin msrp5=pmax));

    by origin type;

run;

```

- ❶ The SAS data set SASHELP.CARS is sorted by ORIGIN and TYPE and the new sorted data set is named CARS. The ORIGIN and TYPE sort is needed for a later merge.
- ❷ PROC REPORT is used to create a data set which contains the MSRP percentiles. The data set is named QUARTILES with the OUT= option.
- ❸ Note that the incoming variable MSRP is used for five PROC REPORT columns. Four aliases, MSRP2 through MSRP5, are created for MSRP so the variable can be the source for five different statistics in the DEFINE statements that follow.
- ❹ The DEFINE statement for MSRP requests the 25<sup>th</sup> Percentile statistic amount with “P25”. In the following DEFINE statements,

- MSRP2 requests the Median
- MSRP3 requests the 75<sup>th</sup> Percentile (with “P75”)
- MSRP4 requests the minimum MSRP (with min)
- MSRP5 requests the maximum MSRP (with max)

A print of the new data set QUARTILES is shown in Table 9.3.

**Table 9.3 Partial Print (WHERE ORIGIN=“USA”) of PROC REPORT Output Data Set QUARTILES**

Origin	Type	MSRP	msrp2	msrp3	msrp4	msrp5	_BREAK_
USA	SUV	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795	
USA	Sedan	\$19,090	\$24,260	\$30,835	\$10,995	\$50,595	
USA	Sports	\$33,500	\$37,530	\$51,535	\$18,345	\$81,795	
USA	Truck	\$19,488	\$23,703	\$34,820	\$14,385	\$52,975	
USA	Wagon	\$17,475	\$22,290	\$23,560	\$17,045	\$31,230	

- ⑤ The QUARTILES data set is merged back to CARS. The MSRP variables are renamed to have more meaningful names that describe the percentiles they represent. Table 9.4 displays the merged data set.

**Table 9.4 Partial Print of Merged Data Set (some variables excluded)**

Make	Model	Type	Origin	MSRP	per25	per50	per75	pmin	pmax
Buick	Rainier	SUV	USA	\$37,895	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Buick	Rendezvous CX	SUV	USA	\$26,545	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Cadillac	Escalade	SUV	USA	\$52,795	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Cadillac	SRX V8	SUV	USA	\$46,995	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Chevrolet	Suburban 1500 LT	SUV	USA	\$42,735	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Chevrolet	Tahoe LT	SUV	USA	\$41,465	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Chevrolet	TrailBlazer LT	SUV	USA	\$30,295	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Chevrolet	Tracker	SUV	USA	\$20,255	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Dodge	Durango SLT	SUV	USA	\$32,235	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Ford	Excursion 6.8 XLT	SUV	USA	\$41,475	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795

Make	Model	Type	Origin	MSRP	per25	per50	per75	pmin	pmax
Ford	Expedition 4.6 XLT	SUV	USA	\$34,560	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Ford	Explorer XLT V6	SUV	USA	\$29,670	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Ford	Escape XLS	SUV	USA	\$22,515	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
GMC	Envoy XUV SLE	SUV	USA	\$31,890	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
GMC	Yukon 1500 SLE	SUV	USA	\$35,725	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
GMC	Yukon XL 2500 SLT	SUV	USA	\$46,265	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Hummer	H2	SUV	USA	\$49,995	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795
Jeep	Grand Cherokee Laredo	SUV	USA	\$27,905	\$26,545	\$32,235	\$42,735	\$20,130	\$52,795

## Produce the Report

Now that we have the group statistics merged back to the CARS data, we are ready to produce the print report.

### Code for Print Report

```

** Titles; ❶

TITLE "Continent of #byvar1: #byval(origin)";
TITLE2 "Vehicle #byvar2: #byval(type)";

** ODS PDF Specifications;

ods escapechar="^";

options nobyline nodate nonumber orientation=portrait; ❷

ods _all_ close;

ods pdf file = "c:\temp\Ch10Cars.pdf"

uniform pdftoc=2 style=harvest; ❸

```



```

ods proclabel="MSRP Report by Origin and Type"; ④

proc report data=cars nowd spanrows split="|" missing
  style(report)=[asis=on]; ⑤

  by origin type; ⑥

  column type=type2 make msrp=MSRPORD model cylinders horsepower msrp
    per25 per50 per75 pmin pmax msrpptle; ⑦

** DEFINE Specifications; ⑧
define type2 / noprint;
define make / order style(column)=[font_weight=bold];
define MSRPORD / order noprint;
define model / order;
define cylinders / order style(column)=[just=c];
define horsepower / order style(column)=[just=c];
define per25 / noprint;
define per50 / noprint;
define per75 / noprint;
define pmin / noprint;
define pmax / noprint;
define msrpptle / computed "MSRP|Price Point"
  style(column)=[just=l indent=.75 in
    cellwidth=1.8 in];

** Create Price Symbols Column and Highlight Min and Max Rows; ⑨
compute msrpptle / char length=6;

** Determine Percentile and Assign $ Symbols;
if msrp.sum <= per25.sum then msrpptle="$";

```

```

else if per25.sum < msrp.sum <=per50.sum then msrpptle="$";
else if per50.sum < msrp.sum<= per75.sum then msrpptle="$$$";
else if msrp.sum > per75.sum then msrpptle="$$$$";

** Color Min and Max Cells;

if pmin.sum=msrp.sum then
    call define('msrp.sum','style','style={background=blue
                foreground=white font_weight=bold}');

if pmax.sum=msrp.sum then
    call define('msrp.sum','style','style={background=red
                foreground=white font_weight=bold}');

endcomp;

compute before _PAGE_ / left; ⑩
length text0 - text6 $100;
if _BREAK_=' ' then
do;

text0="^{style [font_size=12 pt textdecoration=underline]"
      ||strip(type2)||" MSRP Price Point}";

text1="MSRP <=25th Percentile ("
      ||strip(put(per25.sum,dollar10.))||") ($)";

text2="MSRP <=50th Percentile ("
      ||strip(put(per50.sum,dollar10.))||") ($$)";

text3="MSRP <=75th Percentile ("
      ||strip(put(per75.sum,dollar10.))||") ($$$)";

text4="MSRP > 75th Percentile ("
      ||strip(put(per75.sum,dollar10.))||") ($$$$)";

** Min/Max Legend with text;

```

```

text5=
  "^{style [font_face=wingdings font_size=12 pt foreground=blue]n}"
  ||"Lowest MSRP: " || strip(put(pmin.sum,dollar10.));

text6=
  "^{style [font_face=wingdings font_size=12 pt foreground=red]n}"
  ||"Highest MSRP: " || strip(put(pmax.sum,dollar10.));

end;

** Put New Variables in Line Statements;

line text0 $100.;
line '';
line text1 $100.;
line text2 $100.;
line text3 $100.;
line text4 $100.;
line '';
line text5 $100.;
line text6 $100.;

endcomp;

compute before make;
  line '';
endcomp;

run;

ods pdf close;

ods html;

```

- ❶ ORIGIN is the first BY variable. #BYVAR1 provides the name of this variable, so “Continent of #BYVAR1” translates into “Continent of Origin.” Of course, we could have just typed the word “Origin,” but for this example we are demonstrating this feature.

#BYVAL(*variable*) provides the value of the variable specified in parentheses, allowing a dynamic title for each value of the BY variable. For example, when the Origin is USA, #BYVAL(ORIGIN) translates into “USA” in the page title.

TYPE is the second BY variable. #BYVAR2 provides the name of this variable, so Vehicle #BYVAR2 translates into “Vehicle Type.”

#BYVAL(TYPE) translates into “SUV,” “Sedan,” and other vehicle types depending on the page of the report.

- ❷ NOBYLINE: The report tables are produced by ORIGIN and by TYPE. The NOBYLINE option is specified so we can customize our own format of the “BY LINES,” which we will insert into the page titles.
- ❸ ODS PDF Specifications

The UNIFORM option keeps the BY group tables the same width.

### Table of Contents Specifications

A table of contents (TOC) is produced by default in the PDF destination. It can be omitted with the NOTOC option. The TOC does not show on the printed report, but it is available onscreen so the user can select the portion of the report they would like to view. For the MSRP report, we want to keep the table of contents and change some of the default TOC settings.

Specifically, we want a user to easily know which link to click to get to a desired section of the report. Figure 9.2 displays the default TOC as it appears on page 1 of the report.

Using Asia Hybrid as an example, note that there are currently 4 nodes in the default TOC.

- The Report Procedure
- Origin=Asia Type=Hybrid
- Detailed and/or summarized report
- Table 1

Clicking on either of the last two nodes (“Detailed and/or summarized report” or “Table 1”) does not provide additional functionality for this report; both nodes lead to the Origin=Asia Type=Hybrid report. Since these last two nodes are extraneous, we would like to remove them.

We do this by setting the TOC level of node expansion to 2 with the code **PDFTOC=2**. The result is shown in Figure 9.3, for which we now only see the first two nodes (“The Report Procedure” and “Origin=Asia Type=Hybrid”).

Figure 9.2 Default TOC

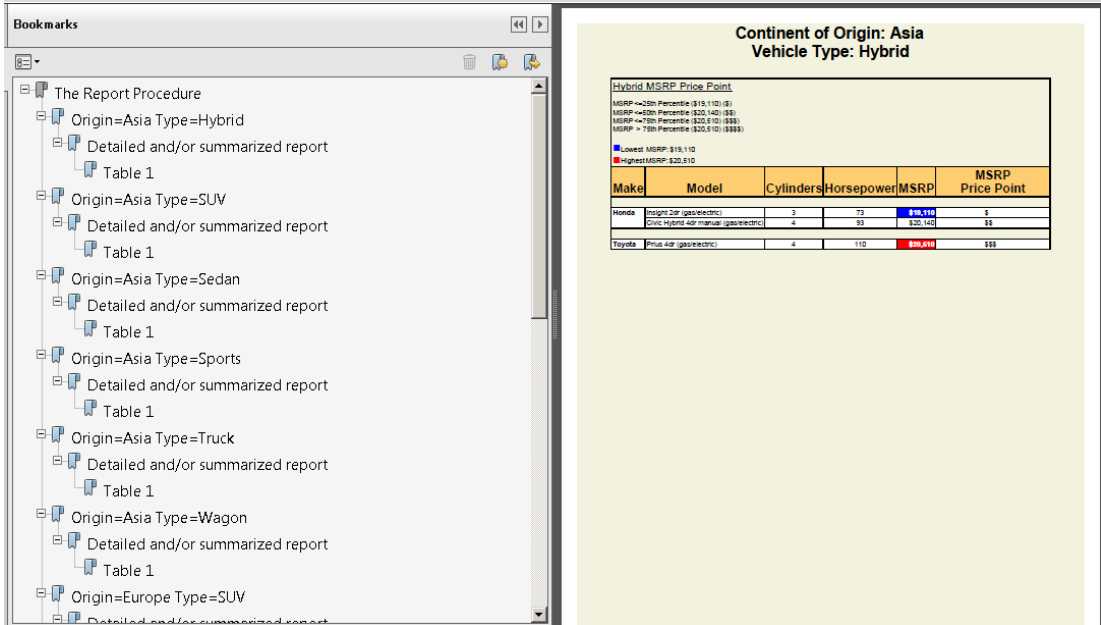
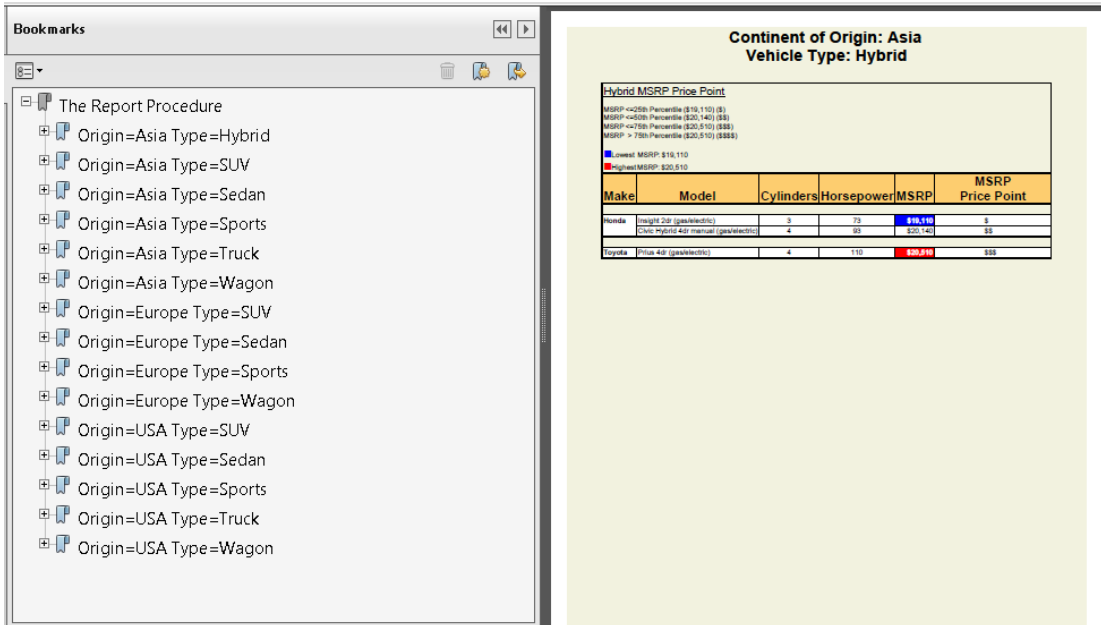


Figure 9.3 TOC with Revised Node Expansion (Reduction)



- 4 With the ODS PROCLABEL (procedure label) option, we are able to further change the TOC Appearance by Changing the first node’s text from “The Report Procedure” to “MSRP Report by Origin and Type.” Figure 9.4 shows the final TOC.

Figure 9.4 TOC with Procedure Label Changed

The screenshot shows the SAS ODS interface. On the left, a 'Bookmarks' pane displays a tree structure under the title 'MSRP Report by Origin and Type'. The tree includes nodes for various combinations of Origin (Asia, Europe, USA) and Type (Hybrid, SUV, Sedan, Sports, Truck, Wagon). On the right, the main report area displays a summary table titled 'Continent of Origin: Asia' and 'Vehicle Type: Hybrid'. The table is titled 'Hybrid MSRP Price Point' and includes summary statistics for MSRP (Lowest: \$19,110, Highest: \$20,510) and a data table with columns: Make, Model, Cylinders, Horsepower, MSRP, and MSRP Price Point.

Make	Model	Cylinders	Horsepower	MSRP	MSRP Price Point
Honda	Accord 2.0 (gas/electric)	5	73	\$19,110	5
Civic	Hybrid EX manual (gas/electric)	4	93	\$20,140	88
Toyota	Prius 4.0 (gas/electric)	4	110	\$20,810	55

- 5 SPANROWS, an option added with SAS 9.2 is used to create a single cell for each level of vehicle type. Note how the “Buick” cell in Figure 9.1 spans across both “Model” rows. ASIS=ON is used to preserve leading spaces in text that we have throughout the report.
- 6 The BY statement specifies that tables should be produced by ORIGIN and TYPE.
- 7 Aliases TYPE2 and MSRPORD are created.  
 TYPE2 is needed for the COMPUTED TEXT0 variable in which we insert the vehicle TYPE before each page (example, “SUV MSRP Price Point”).  
 MSRPORD is needed for ordering rows.  
 The desired row order is MAKE, MSRP, and then MODEL. However, we want to display MSRP after MODEL as the fifth column in the report.  
 The following COLUMN statement leads to the output in Figure 9.5, in which Models are in alphabetical order rather than the desired order of ascending MSRP within Make.

```
column MAKE MODEL cylinders horsepower MSRP
      per25 per50 per75 pmin pmax msrpptle;
```

This occurs because report variables are processed from left to right, therefore the report in Figure 9.5 is ordered by make and model first, and later by MSRP.

Figure 9.5 Rows Not in Desired Ascending MSRP Order

**Continent of Origin: USA**  
**Vehicle Type: SUV**

SUV MSRP Price Point					
MSRP <=25th Percentile (\$26,545) (\$)					
MSRP <=50th Percentile (\$32,235) (\$\$)					
MSRP <=75th Percentile (\$42,735) (\$\$\$)					
MSRP > 75th Percentile (\$42,735) (\$\$\$\$)					
■ Lowest MSRP: \$20,130					
■ Highest MSRP: \$52,795					
Make	Model	Cylinders	Horsepower	MSRP	MSRP Price Point
Buick	Rainier	6	275	\$37,895	\$\$\$
	Rendezvous CX	6	185	\$26,545	\$
Cadillac	Escalade	8	295	\$52,795	\$\$\$\$
	SRX V8	8	320	\$46,995	\$\$\$\$

To obtain the desired row order, we create MSRPORD to be used as an ORDER variable before MODEL, and suppress the printing of MSRPORD with NOPRINT. Later in the COLUMN statement, MSRP is listed for printing. The final COLUMN statement is specified as:

```
column type=type2 make msrp=MSRPORD model cylinders horsepower msrp
      per25 per50 per75 pmin pmax msrpptle;
```

- ⑧ The only printed columns are MAKE, MODEL, CYLINDERS, HORSEPOWER, MSRP, and the COMPUTEd column MSRPPTLE. The other report variables are used for other purposes and are specified as NOPRINT in the DEFINE statements.
- ⑨ The following steps are taken to obtain the MSRP Price Point “\$” symbols.
  - A new COMPUTE variable, MSRPPTLE is created. It is specified as a character (CHAR) variable. The character (or char) designation is necessary for computed character variables. The length is specified as 6.

- IF and ELSE IF statements are used to determine into which percentile each record's MSRP falls. Because MSRP and the percentile variables are ANALYSIS variables, the .SUM suffix is needed for the COMPUTE block to recognize the variables. MSRPPTLE \$ values are assigned according to each vehicle's percentile placement.

Call DEFINE is used to change an MSRP cell's background color to blue and font color to white, if its MSRP.SUM value equals the Minimum MSRP.

Likewise, Call DEFINE is used to change an MSRP cell's background color to red and font color to white, if its MSRP.SUM value equals the Maximum MSRP.

- ⑩ COMPUTE BEFORE \_PAGE\_ causes the compute block to execute once for each page after printing the titles. LEFT is specified so all of the LINES specified in this block will be left justified.

Seven text variables (TEXT0 through TEXT6) that will be placed in corresponding line statements are created.

- TEXT0 contains the main header, for example: "SUV MSRP Price Point"
  - The inline formatting function STYLE (used along with our declared ODS character "^") allows us to style our header to be 12 point font and underlined.
  - The STYLE function, enclosed in {}, has two arguments:
    - our style overrides, enclosed in [ ] and,
    - the text to be formatted (the text of our TYPE2 variable concatenated with "MSRP Price Point").
- TEXT1 through TEXT4 variables contain the MSRP Price Point descriptions.
  - For example, "MSRP<=25th Percentile (\$26,545) (\$)".
- TEXT5 and TEXT6 variables contain the Minimum and Maximum values, respectively. A colored symbol is placed to the left of each of these to serve as a legend for the colored minimum and maximum cells in the table body.
  - Style function are used to apply Wingdings font to the 'n' character to display this as a square.
  - The color of the square for lowest MSRP is applied a font color of blue. The square for the highest MSRP is given a red foreground.



- The square is concatenated to the description (Highest or Lowest) along with the corresponding minimum or maximum value.

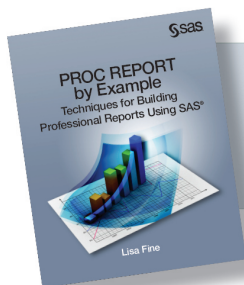
TEXT0 through TEXT6 are put in individual line statements to be placed before each page of the report.

---

## Chapter 9 Summary

This chapter covered how to create the MSRP report using the following steps.

- PROC REPORT was used to easily obtain group statistics, including quartiles and minimum and maximum values.
- The PROC REPORT output data set was merged back to the CARS data to allow for easy comparison of individual vehicle MSRPs to the group statistics.
- A second PROC REPORT created the printed report. Some of the items this section demonstrated included:
  - how to modify a PDF Table of Contents with the PDFTOC option and ODS PROCLABEL statement
  - the use of #BYVAR and #BYVAL options within a title statement
  - the use of an alias for BY variables so that they could be used in a COMPUTE block
  - the use of an alias to order rows
  - the SPANROWS option which allows a group or order variable to display in one cell that spans across the individual rows in that grouping
  - how to insert text lines and symbols above each page of a report



From *PROC REPORT by Example*. Full book available for purchase [here](#).

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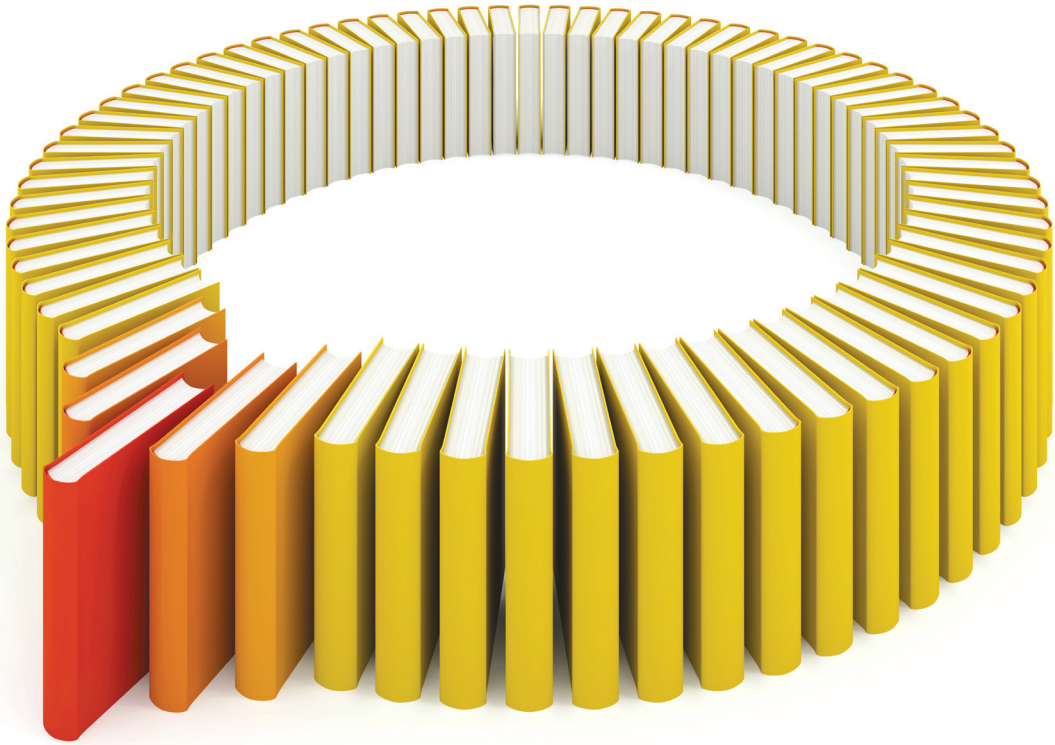
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