

EXPORTING SAS® OUTPUT ONTO THE WORLD WIDE WEB

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ABSTRACT

This paper presents a step by step demonstration of exporting SAS list and graphics output onto the World Wide Web. The discussion includes :

- * Preparing SAS list and graphics output,
- * Inserting your SAS list into HTML code,
- * Providing a SAS macro code to generate HTML code automatically,
- * Converting SAS graphics format to GIF format,
- * Illustrating a point and click Web pages with SAS output.

The SAS products used in this paper are: SAS BASE® and SASGRAPH® with no limitation of operating systems.

INTRODUCTION

The World Wild Web (WWW) is just a segment of the vast internet that can be accessed through any internet navigator. It is composed of interlinking Hyper Text Markup Language (HTML), documents that look similar to that of pages in a book. HTML provides the working grounds and underpinnings for information search and navigation. Taking advantage of technologies superior data transfer rates, it has gone beyond the static look of book pages. Its evolution has become the driving force behind the myriad of colorful interactive screens of text, graphics, and multimedia sprouting over the internet.

As a SAS programmer and consultant, publishing Web pages with SAS output presents a platform from which SAS output and data listing can be share with the rest of SAS user community, colleagues, business clients, and the general public. Web pages provide instant output to an unlimited internet audience. Companies can also utilize this tool as a single central electronic repository for all document management.

To export SAS output to the World Wide Web, some background knowledge about the internet universe and HTML will be supplied. This paper is organized as a step by step demonstration for each of the subject discussed.

SAMPLE DATA INPUT AND OUTPUT LIST

The following sample data are used as input to generate the SAS list output.

Height	Weight	Sex
69.0	112.5	M
56.5	84.0	F
65.3	98.0	M
62.8	102.5	F
63.5	103.5	M
57.3	83.0	F

59.4	84.5	M
62.5	111.0	F
62.8	98.0	M
59.0	99.0	F
51.3	50.9	M
64.3	92.3	F
56.3	78.0	M
66.5	113.2	F
72.0	150.3	M
64.8	127.0	F
67.0	133.0	M

Table 1. Sample Data

The SAS procedures **PROC PRINT** and **PROC TABULATE** are used to produce list output. These two output lists are transported to Microsoft Word for Windows® for processing.

The file under Word environment needs to change to the following setup parameters:

	Parameter Name	Value
Page Size	Orientation	Landscape
Font Name	Courier New	
Font Size		8

and converted to a Word document.

This Word document of SAS output is referred as **LIST1.doc**.

HTML CODE

In HTML BODY block, you can insert Preformatted Text Tag **<PRE>** **</PRE>**. The functionality of this Tag is to preserve spacing and layout of original text in monospaced font. The default background color is gray. When capturing the window we would suggest that one has the background white or very light and the foreground black or very dark. The contrast makes the image appear sharper on paper and on screen. The following HTML code illustrated here will produce the Web pages with SAS list output. (See Figure 1)

```
<BODY BACKGROUND=whiteb.gif> <PRE>

insert LIST1.doc here

</PRE> </BODY>
```

SAS MACRO TO GENERATE SAS LIST PAGES

The alternative approach is to create a SAS macro module which accepts user supplied SAS output file name with its subdirectory location, the module will generate a complete HTML code for the SAS output pages.

The arguments for this macro are:

ifile: SAS output list name and its location,

ofile: HTML code and where to store it.

```

%macro html1(ifile= , ofile= );

  %LET H1 = '<HTML><HEAD><TITLE><H1>';
  %LET H2 = '</H1></TITLE></HEAD>';
  <BODY BACKGROUND=whiteb.gif><P5><B><PRE>';
  %LET H3 = '</PRE></B></P5></BODY></HTML>';

  data _null_;
    infile " &ifile" END=EOF;
    file " &ofile";
    input;
    if _n_ = 1 then put
      @1 &H1 @24 &H2 ;
    if not EOF then do;
      put _infile_ ;
    end; else put @1 &H3 ;
  run;
%mend;

```

The following example shows how to invoke this macro.

```

%html1 (ifile=c:\sugi22\list1.lis,
       ofile=c:\sugi22\html1.htm);

```

WEB PAGES WITH SAS LIST OUTPUT

Figure 1 shows Web pages with SAS list output.

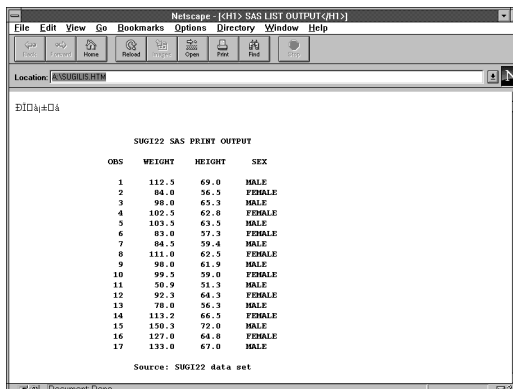


Figure 1. SAS List Output on Web Pages

SAS GRAPHICS OUTPUT

Figure 2 shows a sample SAS graphics output. This graphics output entitled "Lorenz Curve and Concentration Ratio" was presented at SUGI 18 Posters section and published in SUGI 18 Proceedings [3].

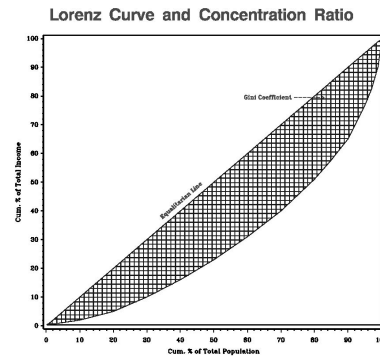


Figure 2 SAS Graphics Output

SAS GRAPHICS FORMAT CONVERSION

The graphics output produced from SAS/GRAPH software can be stored as a sequential graphics stream file (GSF). GSFs are used to capture data streams in the form in which they are sent to a graphics device. The following table shows SAS device names and their descriptions.

SAS Device Name	Description
CGM	Computer Graphics
	Metafiles
HPGL	HP Graphic Language
PS	PostScript

If you include SAS graphics output in Web pages, you must convert SAS graphic format to Web graphic format. This makes it possible for a Web server to deliver multiple forms of data to your browser in a single transfer. The Web graphic formats commonly used are: GIF (Graphics Interchange Format), JPEG (Joint Photographic Expert Group), PDF (Portable Document Format), PS (PostScript), and XBM (X-Window Bitmap). GIF is chosen for this presentation because of its compressed format and compact nature.

Using different graphics format for the same sample graphics output produces different size of the graphic file.

Format	Size (Byte)
BMP	1277118
HPGL	132282
PS	86146
PCX	65053
GIF	8042
CGM	6570

The GIF format can compress the sample image from BMP format up to 159 to 1.

You need to use an Image Editor or Converter to convert your SAS graphics output. It loads SAS graphics files and then lets you save or convert them with the graphics format you want.

The following HTML code will produce SAS graphics output within Web Pages.

```
<BODY >
<IMG SRC =sugig2.gif>
</BODY>
```

Table 2. HTML code for Graphic Output

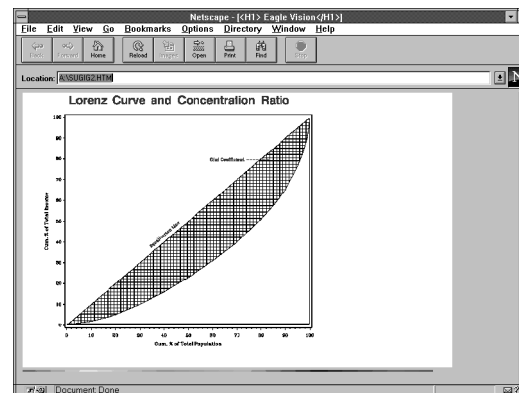


Figure 3. SAS Graphics Output on Web Pages

CONCLUSION

This paper uncovered several findings:

- * Exporting SAS output onto the WWW takes minimal effort and time, and involves no extra hardware equipment.
- * WWW is a key environment because the SAS output is instant and conveniently displayed to a mass audience.
- * Evolution of the WWW application is unlimited, with the future holding animated and multimedia SAS outputs.

REFERENCES

[1] Williams, Edmond, Shi-Tao Yeh; *Importing and Exporting SAS Output with Microsoft Word for Windows*, NESUG 8th Annual Conference Proceedings, pp. 728-734, October 1995

[2] Shi-Tao Yeh and Williams, E., "Using PROC GPRINT and Enhancing the Printed Output" NESUG 8th Annual Conference Proceedings, pp. 742-746 October 1995

[3] Shi-Tao Yeh, "Estimation of the Lorenz Curve and Concentration Ratio", SUGI 18 Proceedings, pp. 873-877, SAS Institute Inc., May 1993

[4] SAS Institute Inc., *SAS/GRAPH Software*. Version 6. 1990
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