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Creating PDF Reports using Output Delivery System

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ABSTRACT

Output Delivery System (ODS) in V9.2 provides new and enhanced capabilities to programmers for reporting and displaying clinical trials results with numerous options that provide greater control of formatting and layout of the report. The purpose of this paper is to list and demonstrate variety of ODS parameters that help control display of statistical reports while creating PDF reports. Fundamental ODS procedures included in the article but not limited to, are, controlling the structure of the report (eg. ODS DOCUMENT), sending reports directly to a printer (eg. ODS PDF), inserting text into an ODS output (ODS TEXT =), setting valid values for page orientation (eg. PAGESTYL) and controlling the level of expansion of PDF table of Contents (eg. PDFTOC). These functionalities are illustrated using SAS9.2 version on a Windows operating system.

The objective of this paper is to reveal techniques that were used to produce ODS reports from 'Legacy' reports - 'Legacy' throughout this presentation refers to non-ODS practice (practice in use before the implementation of ODS reporting). This paper does not provide a preface to Proc Report or ODS, but provides some easy and realistic guidelines to produce ODS reports and help minimize time and effort on the part of Statistical programmers and Statistical users. It provides some directives with an emphasis on illustrations of basic ODS functionalities that would require minimal syntax usage. These options will be illustrated with simplified examples and case studies.

INTRODUCTION

The increasing demand for reporting information via the web has necessitated the usage of Adobe Portable Document (PDF) as it ensures a standard staging of information. This paper discusses the steps involved in creating PDF reports using the SAS Output Delivery System. As a first step in the development of an ODS report, it becomes necessary that the Statistical programmer/User evaluate the pre-existing Legacy reports which is a model for the ODS reports in order to be able to re-design the report. The relevance of items such as proportional font-size, grid line positioning in report columns and rows and margin placements is to be taken into consideration while designing the display of ODS reports.

DESCRIPTION

The paper starts with the demonstration of the basic ODS syntax and assembles all the required syntax for creating PDF files. The sections in this paper discuss the following but are not limited to:

- a) Data handling and Conversions.
- b) Perform essential ODS dispensation.
- c) Release and Secure ODS PDF destination.

[1] Data handling and Conversions

Title and footnote lines may be coded directly in the reporting program. The user can put in ODS specifications such as bolding or underlining to parts of the lines or to the parameter values themselves. SAS limits the title line specifications to 10 title lines.

The usage of ODS escape character followed by the PDF line indicator 'n', '2n', '3n' etc Could help control the number of title lines displayed.

Syntax:

```
ods escapechar = '^';

%if &ods_dest = PDF %then %do;

    DATA _null_;
        length label $ 250.;
```

```

set test end = eof;
retain label ` `;
if mod(_n_,%eval (count+1) = 0 then do;
    label = trim(label)
           ||    "^ -2n"
           ||    trim(test);
end;
run;

%end;

```

In some situations, data transformation code may have to be evaded so that the ODS report can be properly produced. In ODS mode reporting SAS will not split the values. To be able to insert this functionality for ODS reporting, a DATA step or REPORT COMPUTE block translate the split char to the hexadecimal value '036e'x could be added.

```
For eg: Action =tranwrd(action, '@', '036e'x);
```

[2] Perform essential ODS dispensation.

After determining how the display of the ODS reports should look like, the user could add in the specifications using the PROC TEMPLATE code. The specifications are defined in the program via the TEMPLATE code.

Commonly Used Attributes parent=style-definition

Style Definition Example

```

PROC TEMPLATE;
  Define style gotstyle / store = templates;

      parent = Styles.rtf
;
class body /
  backgroundcolor = grey
  color           = black
  fontfamily      = "Arial"
;
class table /
  bordercolor    = black
  borderstyle    = solid
  cellpadding    = 6pt
  cellspacing    = 1pt
  frame          = void
  rules          = groups
;
class color_list /
  'link' = green
  'fg'   = black
;
class systemtitle /
  protectspecial characters = OFF
;
class data /
  fontfamily = "Arial"
;
class systemfooter /
  font = Fonts('footFont')
  protectspecial characters = OFF
;

```

```

class rowheader /
  protectspecial characters = OFF
;
class usertext /
  protectspecialcharacters = OFF
;

run;

ods pdf style = gotstyle;
PROC REPORT DATA = test;
run;
ods pdf close;

```

[3] Release and Secure ODS PDF destination.

The next step in the generation of ODS reports after defining the reporting style and formatting specifications would be to read the file into the output PDF destination.

Common options:

COMPRESS = n

controls the compression of a PDF file, which reduces the size of the PDF file. 'n' specifies the level of compression with a range 0-9.

PDFTOC = n

controls the table of contents node expansion of a PDF file. 'n' specifies the level of node expansion in the table of contents.

BOOKMARGEN= no | yes

controls the generation of bookmarks in the PDF file.

Syntax:

```
options pdfcopy pdfaccess pdfassembly pdfcomment nopdfcontent;
```

```

ods document name=rpt(write);

ods pdf file          = "myfile.pdf"
  compress = n
  newfile   = NONE
  pdftoc   = n
  startpage = YES
  style    = style-definition

  nobookmarkgen
;

ods pdf close ;

```

The PDF destination and the file associated with it always has to be closed. The file cannot be printed until we close the destination.

Global options such as

a) PDF SECURITY = none |low |high – helps to control the level of encryption for a PDF document at all levels. The default value is NONE

b) PDF PASSWORD = (open= "password" owner = "password")- helps to control the owner and open passwords on a PDF document.

Sample output:

The SAS System 14:33 Wednesday, July 21, 2010 1

The REG Procedure
Model: MODEL1
Dependent Variable: write writing score

race=1

Number of Observations Read	24
Number of Observations Used	24

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	671.52727	335.76364	7.81	0.0029
Error	21	902.43106	42.97291		
Corrected Total	23	1573.95833			

Root MSE	6.55537	R-Square	0.4266
Dependent Mean	46.45833	Adj R-Sq	0.3720
Coeff Var	14.11022		

CONCLUSIONS

This paper is a quick reference to the basic steps involved in ODS PDF report generation. It also can give a few insights on creating ODS PDF reports. Based on some of the ideas in this paper, we hope you can apply some of the methods listed to improve the report qualities and save programming time.

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