A Productive Word Wrap Macro

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INTRODUCTION:

If a data set contains a large number of variables, and one needs to print full observations with some wrapped variables on each page, PROC SQL and PROC REPORT cannot handle the job although they both have flow options. This paper presents a productive SAS macro using a Split-Merge approach to wrap as many long text variables as required. Generally the wrap macro can be implement before using PROC PRINT. The output is neat and readable.

THE SPLIT-MERGE APPROACH

When a long text variable needs to be wrapped, normally, this variable can be split into lines based on a given output length, and then the split text can be written out to a SAS data set. However, the SAS data set will include the duplicated value of non-wrapped variables. To avoid this duplication, you can split an input data set into two output data sets. The first data set contains the first split line of the long text variables. The second data set contains the remaining split lines of the long text variables and other variables. Because both data sets also include a runtime variable cpr about the order of observation, therefore, merging these two data sets by the variable cpr will avoid the duplicated value of non-wrapped variable.

THE WRAP MACRO: WORDWRAP

WORDWRAP is invoked with four keyword parameters. These keywords, used throughout the macro in the form of macro variables, enable the user to achieve a great deal of flexibility from using this productive macro: one can choose any text variables for wrapping, and one can wrap as many long text variables as required.
Posters

%do %until (%scan(&var,&_rn)-);
%let var&_m~%scan(&var, &~);
/* Get varl, var2, var3 ... */
%let len&_rn~%scan(&length,&_m);
/* Get lenl, len2, len3 ... */
%let _rn~%eval(&_rn+l);
tend;
%let _rn~%eval(&_rn-l);
/* Get the number of the long text variables */
%do _i~&_m%to 1 %by -1;
%let _corn~_COM&_i &_corn;
%let _blk~_BLK&_i &_blk;
tend;

**************************************;
* SUB1 contains the first split line *;
* of long text variables. *;
* SUB2 contains the remaining split *;
* lines of long text variables. *;
* Description of Variables *;
* -------------------------- *;
* _COM1, _COM2, .... *;
* Store the remaining text of *;
* the long text variables after *;
* split line. *;
* _BLK1, _BLK2 *;
* Word break point at end line. *;
* CTR Counter for observation to be *;
* Written to a SAS data set. *;
* _L split line number of the long *;
* text variables. *;
**************************************;

DATA SUB1(DROP=&_com &_blk J _L)
SUB2(KEEP=id &var CTR);
LENGTH &_com $200;
RETAIN CTR 0;
SET &data;
_L=1;
RUN;

**************************************;
* PREWRAP: *;
* ------- *;
* 1. Determines whether the long *;
* text variable need to be *;
* wrapped or not. *;
* 2. _L =1 indicates that the all *;
* long text variables of current *;
* observation do not need to be *;
* wrapped. *;

PREWRAP:
%do _i=1 %to &_m;
 _COM&_i=&var&_i;
%end;
%do _i=1 %to &_m;
 IF length(&&var&_i)&&len&_i THEN
 GOTO WRAP;
 ELSE
 IF & _i=&_m AND _L=1 THEN
 DO:
 CTR+1;
 OUTPUT SUB1;
 END;
 ELSE
 IF & _i=&_m AND _L>1 THEN
 DO:
 CTR+1;
 OUTPUT SUB2;
 END;
 %end;
RETURN;

**************************************;
WRAP:
%do _i=1 %to &_m;
 _BLK&_i=0;
 IF LENGTH(_COM&_i)&&len&_i THEN
 DO;
 _J=&&len&_i TO 1 BY -1;
 IF SUBSTR(_COM&_i,J,1)= '*
 / Look backwards for a 
 blank until a blank is 
 found */
 THEN
 DO;
 _BLK&_i=_J;
 GOTO LOOP&_i;
 END;
 END;
END;
END;

* 3. _L > 1 indicates some or all *;
* long text variables have been *;
* successfully wrapped. Last line *;
* of long text variables remains. *;
* ***************;

3. _L > 1 indicates some or all *;
  long text variables have been *;
  successfully wrapped. Last line *;
  of long text variables remains. *;
  ***************;

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EXAMPLE:

The following program shows how to create a word-wrapped SAS data set by using WORDWRAP. The word-wrap data listing is shown in Appendix.

LIBNAME SSD [PROJECT.STUDY.SSD];

DATA A;
  SET SSD.ADVERSE;
  BY PATID;
  IF FIRST.PATID THEN AENUM=1;
  ELSE AENUM+1;
RUN;

%WORDWRAP
  (data=a, id=patid, var=ae comments, len=20 25);
  /* Length of var AE is 20, and length of var comments is 25 */

PROC PRINT DATA=A;
  ID PATID;
  BY PATID;
  /* When the ID and BY variables are the same, the ID variable is listed only once for each group */
RUN;

REFERENCES:


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## Appendix: An Example of Word-Wrapped Data Listing

### GENZYM CORPORATION
CAMBRIDGE, MASS.

**STUDY NUMBER:** ..

**PRODUCT DESCRIPTION:** 14:56/18DEC95

### ADVERSE EVENTS

<table>
<thead>
<tr>
<th>PATID</th>
<th>AE ID</th>
<th>AE BASELINE</th>
<th>AE DESCRIPTION</th>
<th>AE OUTCOME</th>
<th>AE SUMMARY</th>
<th>AE CODE</th>
<th>AE LOCATION</th>
<th>AE ACTION</th>
<th>AE RELATIONSHIP</th>
<th>AE COSTARTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>901</td>
<td>1</td>
<td>Y</td>
<td>WITHDRAWAL SKIN</td>
<td>NOSE</td>
<td>INTRAVENOUS ACCESS</td>
<td>15JAN94</td>
<td>25JAN94</td>
<td>0:00:00</td>
<td>INTERMITTENT</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Y</td>
<td>FEVER</td>
<td>Y</td>
<td>MILD</td>
<td>INTRAVENOUS ACCESS</td>
<td>15JAN94</td>
<td>24JAN94</td>
<td>17:00:00</td>
<td>INTERMITTENT</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Y</td>
<td>CELLULITIS</td>
<td>N</td>
<td>MILD</td>
<td>INTRAVENOUS ACCESS</td>
<td>15JAN94</td>
<td>24JAN94</td>
<td>0:00:00</td>
<td>SINGLE</td>
<td>9</td>
</tr>
<tr>
<td>902</td>
<td>1</td>
<td>N</td>
<td>SEVERE</td>
<td>NOSE</td>
<td>INTRAVENOUS ACCESS</td>
<td>15JAN94</td>
<td>17JAN94</td>
<td>18:00:00</td>
<td>INTERMITTENT</td>
<td>1</td>
</tr>
<tr>
<td>903</td>
<td>1</td>
<td>Y</td>
<td>FEVER</td>
<td>MILD</td>
<td>INTRAVENOUS ACCESS</td>
<td>24JAN94</td>
<td>25JAN94</td>
<td>16:00:00</td>
<td>INTERMITTENT</td>
<td>0 0 1</td>
</tr>
<tr>
<td>2</td>
<td>Y</td>
<td>LEFT ARM CELLULITIS</td>
<td>MILD</td>
<td>INTRAVENOUS ACCESS</td>
<td>25JAN94</td>
<td>18JAN94</td>
<td>6:45:00</td>
<td>SINGLE</td>
<td>0 0 6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>N</td>
<td>SHAKING CHILLS</td>
<td>MILD</td>
<td>INTRAVENOUS ACCESS</td>
<td>25JAN94</td>
<td>25JAN94</td>
<td>7:30:00</td>
<td>SINGLE</td>
<td>55 0 0</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>N</td>
<td>ARTHRITIS</td>
<td>MILD</td>
<td>NOSE</td>
<td>INTRAVENOUS ACCESS</td>
<td>27JAN94</td>
<td>28JAN94</td>
<td>0:00:00</td>
<td>SINGLE</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Y</td>
<td>P-sensitive</td>
<td>NOSE</td>
<td>INTRAVENOUS ACCESS</td>
<td>27JAN94</td>
<td>28JAN94</td>
<td>15:45:00</td>
<td>SINGLE</td>
<td>0 0 2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>N</td>
<td>CONSTITUTION</td>
<td>MILD</td>
<td>INTRAVENOUS ACCESS</td>
<td>28JAN94</td>
<td>28JAN94</td>
<td>0:00:00</td>
<td>SINGLE</td>
<td>0 0 0 1</td>
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</tr>
<tr>
<td>904</td>
<td>1</td>
<td>N</td>
<td>BACK ITCHING RASH</td>
<td>NOSE</td>
<td>INTRAVENOUS ACCESS</td>
<td>1MAY94</td>
<td>1MAY94</td>
<td>0:00:00</td>
<td>SINGLE</td>
<td>1</td>
</tr>
</tbody>
</table>

### Notes:

- NA = NOT AVAILABLE
- ND = NOT DONE
- -99 = MISSING NUMERIC VALUE
- N/A = NOT APPLICABLE
- UN = UNKNOWN
- 01/10/94 = MISSING/PARTIAL DATE

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**ACTION TAKEN**

<table>
<thead>
<tr>
<th>PATID</th>
<th>ACTION</th>
<th>OTHER ACTION</th>
<th>RELATIONSHIP TO PRODUCT</th>
<th>OUTCOME</th>
<th>NEAR SYMPTOMS</th>
<th>COSTARTS</th>
<th>BODY SYMPTOMS</th>
<th>BODY TERN</th>
<th>NEAR TERN</th>
<th>COSTARTS</th>
<th>BODY TERN</th>
<th>NEAR TERN</th>
</tr>
</thead>
<tbody>
<tr>
<td>901</td>
<td>NONE</td>
<td>Y</td>
<td>NO</td>
<td>REC</td>
<td>PATIENT RECEIVED</td>
<td>W/IN/SYND</td>
<td>CNS/INN/NER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>NO</td>
<td>REC</td>
<td>PATIENT TREATED WITH TYLENOL</td>
<td>FEVER</td>
<td>GEN/ BODY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>NO</td>
<td>REC</td>
<td>PATIENT TREATED WITH TYLENOL</td>
<td>CELLULITIS</td>
<td>GEN/ BODY</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>NO</td>
<td>REC</td>
<td>KIDNEY AND MEDICAL CONSULT</td>
<td>ANGIOCARDIAC</td>
<td>GEN/ BODY</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>NO</td>
<td>REC</td>
<td>TREATMENT TAKEN</td>
<td>TYLENOL</td>
<td>GEN/ BODY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>NO</td>
<td>REC</td>
<td>TREATMENT TAKEN</td>
<td>TYLENOL</td>
<td>GEN/ BODY</td>
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<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>NO</td>
<td>REC</td>
<td>TREATMENT TAKEN</td>
<td>TYLENOL</td>
<td>GEN/ BODY</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>NO</td>
<td>REC</td>
<td>TREATMENT TAKEN</td>
<td>TYLENOL</td>
<td>GEN/ BODY</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>NO</td>
<td>REC</td>
<td>TREATMENT TAKEN</td>
<td>TYLENOL</td>
<td>GEN/ BODY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**LEGEND**

- AE = ADVERSE EVENT
- PATID = PATIENT IDENTIFIER
- AE ID = AE IDENTIFIER
- AE BASELINE = AE BASELINE
- AE DESCRIPTION = AE DESCRIPTION
- AE OUTCOME = AE OUTCOME
- AE SUMMARY = AE SUMMARY
- AE CODE = AE CODE
- AE LOCATION = AE LOCATION
- AE ACTION = AE ACTION
- AE RELATIONSHIP = AE RELATIONSHIP
- AE COSTARTS = AE COSTARTS
- NEAR SYMPTOMS = NEAR SYMPTOMS
- COSTARTS = COSTARTS
- BODY SYMPTOMS = BODY SYMPTOMS
- BODY TERN = BODY TERN
- NEAR TERN = NEAR TERN

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**NOTES**

- ELASTIC NETTING USED TO HOLD DRESSINGS IN PLACE.