A Documentation Listing for SAS Programs
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ABSTRACT

Document your SAS program with an annotated program listing and word cross-reference. This poster displays a SAS program that will document your other SAS programs. The annotated listing highlights DATA and PROC statements as well as all macro features. The cross-reference listing includes all program words not found in comments. The documented program listing and cross-reference report are far superior to a simple program listing.

OVERVIEW

Trying to locate all references to a variable in a large SAS program can be difficult. A variable cross-reference report would greatly help in such a search. Since SAS does not provide such a report, a SAS program was written to create the report. In addition, an annotated listing of the program is printed. The result is a program listing and variable cross-reference report that is suitable for documentation.

The SAS program that performs this documentation is listed in Appendix A. Appendix B shows a sample report performed on a small SAS program. The program can be used on any SAS program that is on 80 character fixed-length records. An optional line number may appear in columns 73-80.

THE ANNOTATED LISTING

The first part of the documented report is a complete listing of the SAS program. If the program is not line numbered, then reference numbers are added to the listing. It is the line numbers or the reference numbers that are used in the cross-reference report. SAS PAGE and SKIP statements are not listed, but they will cause the report to start a new page or skip the indicated number of lines.

Annotation will appear to the right of the program listing. The beginning of every DATA and PROC step is identified by reprinting the statement. Any line containing macro characters "&" or "%" are flagged with the "&" or "%" symbol to the right of the line listing. Also, any %MACRO or %MEND statements are highlighted. A vertical line will connect the %MACRO statement with its corresponding %MEND statement. Nested macros can be handled in this way up to a depth of three. %LET and CALL SYMPUT statements are also listed in the annotation area since they are also macro features.

The resulting annotated listing is a complete program listing identified with either line numbers or reference numbers along with an annotation area highlighting the main macro and step features of the program.

CROSS-REFERENCE

A cross-reference of all program words that are not found in comments is displayed after the annotated listing. Each item is followed by all the line numbers or reference numbers in which it appears in the annotated listing. The cross-reference listing includes much more than just the variables that appear in the program. It includes everything that is not part of a comment. This includes statement keywords and data constants.

HOW TO RUN THE PROGRAM

To identify the program being documented, two things must be done. First, the program to be documented must be allocated to ddname PROGRAM. In TSO, this can be done with:

ALLOC FILE(PROGRAM) DA(datasetname)

Secondly, the program name must be communicated to the cross-reference program through the use of the SYSPARM. In TSO, this can be done with:

SAS INPUT(SASXREF.DAT) OPTIONS('SYSPARM=' "datasetname"

The SYSPARM is picked up by the program and used to identify the program being documented with a TITLE statement.

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**APPENDIX A**

THE SAS DOCUMENTATION PROGRAM

```
/* BADOER - PRINT STANDARD DOCUMENTATION REPORTS FOR SAS PROGRAM. */
/* */
/* 1. ENHANCED PROGRAM LISTING - NOTING MACROS AND STEPS */
/* */
/* CROSS-REFERENCE OF ALL WORDS USED IN PROGRAM */
/* */
/* AUTHOR: BILL MACKORE   SQL 12 RATES & MARKET RESEARCH */
/* PENNSYLVANIA POWER & LIGHT CO., ALLEGHENY PA 15201 */
/* INPUT: DATA=INDO PROGRAM TO BE DOCUMENTED */
/* */
**DADOER PROGRAM:**
/* */
/* PROGRAM NAME FOR DOCUMENTATION TITLE */
/* */
/* DETERMINE IF DATASET IS LINE NUMBERED */
/* */
/* CHECK FOR MISSING NUMERIC DATA IN COLUMNS 73-80 */
/* */
**DATA**
/* TITLE: DOCUMENTATION SOURCE LISTING */
/* ADVANCE: */
/* TITLE: */
/* FILE PRINT: */
/* INFILE PROGRAM: */
/* LENGTH TEXT TEXT 8 NO KEYWORD 8 REF 8 44 */
/* MAC MACVAR S 1 PROTO 8 8 ; */
/* RETAIN INMACRO 0 ; */
/* INPUT TEXT SYNTAX: */
/* TEXT =UPCASE(TEXT); */
/* TEXT =LEFT(TEXT); */
/* */
/* HOME PAGE AND SKIP CONTROL: */
/* */
/* PREDEFINED: */
/* IF PREDEFINED=PAGE: THEN DO: PUT PAGE: DELETE: END: */
/* ELSE IF PREDEFINED=SKIP 1: THEN DO: PUT SKIP 1: DELETE: END: */
/* ELSE IF PREDEFINED=SKIP 2: THEN DO: PUT SKIP 2: DELETE: END: */
/* ELSE IF PREDEFINED=SKIP 3: THEN DO: PUT SKIP 3: DELETE: END: */
/* ELSE: DO: */
/* LINES= SVBSLURRENLINEX2 LINO:]; */
/* */
/* LOCATE DATA, PROC, $TO, MACRO, END, SKIP STOPS */
/* */
**DADOER AFTERTPY (KEYWORD LENGTH):**
/* IF KEYWORD= KEYWORD THEN */
/* DO: */
/* DADOER(KEYWORD) ; */
/* END: */
/* END AFTERTPY: */
/* KEYWORD=SCAN(TEXT LINO:); */
/* IF KEYWORD= MACRO OR KEYWORD= DATA OR KEYWORD=PROC OR */
/* KEYWORD=END OR KEYWORD=EXIT OR KEYWORD=STOP THEN */
/* DO: */
/* EXIT_EXITKEY('MACRO', 'DATA', 'PROC', 'END', 'EXIT', 'STOP'); */
/* END: */
*/
/* LOCATE CALL STATEMENT: */
/* */
/* CALL(INDO(TEXT), 'SYNTAX'); */
/* IF CALL= AND REF= THEN DO: */
/* TEXT =SUBSTR(TEXT, COLC); */
/* CALL(CALL, 'INDO(TEXT), 'SYNTAX'); */
/* CALL(CALL, 'INDO(TEXT), 'SYNTAX'); */
/* END: */
/* IF CALL= AND CALL= AND CALL=CALL THEN REF= */
/* "" SUBSTR(TEXT, 1, CALL) 1, ...); */
/* END: */
/* */
/* FLAG LINES WITH MACRO DESIGNATORS */
/* */
/* IF KEYWORD= 'I' THEN */
/* ELSE */
/* IF KEYWORD= 'A' THEN */
/* ELSE */
/* */
/* AND MACRO NESTING STONES TO REF TEXT */
/* */
/* IF REF= 'I' THEN */
/* ELSE */
/* IF REF= 'A' THEN */
/* ELSE */
/* */
/* PRINT LINE - LEADING LINE NUMBERS FOR MACRO FILES */
/* */
/* IF MACNUM=NO THEN */
/* PUT LINE 6. OF TEXT SYNTAX, REF MAC SYNTAX REF MACNUM: */
/* END: */
/* ELSE PUT TEXT SYNTAX, REF MAC SYNTAX REF MACNUM: */
/* END: */
/* */
/* PRINT CROSS REFERENCE REPORT */
/* TITLE: */
/* ADVANCE: */
/* TITLE: */
/* FILE PRINT: */
/* INFILE PROGRAM: */
/* LENGTH LINEX 80 TOKEN 8 16 CHAR 1 */
/* FIND MACRO LINES OF CROSS REFERENCE */
/* */
/* READ IN A LINE AND DELETE A LINE */
/* IF "MACNUM"=YES THEN */
/* /* READ IN A LINE AND DELETE A LINE */
/* IF MACNUM=NO THEN */
/* ELSE DO: */
/* LINES=SVBSLURRENLINEX2 LINO:]; */
/* */
/* SAVE THE HIGHEST LINE NUMBER - FOR REPORT SPACING */
/* */
/* */
/* */
/* LOCATE AND ELIMINATE SLASH-ASTERISK TYPE COMMENTS */
/* */
/* IF COMMENT= "I" THEN */
/* COMMENT CONTINUATION */
/* DO: */
/* END=COMMENT("" "") ; */
/* IF END= "" THEN */
/* END=COMMENT("" "") ; */
/* END=COMMENT("" "") ; */
/* ELSE RETURN: */
/* END=COMMENT("" "") ; */
/* IF COMMENT= "A" AND COMMENT= "A" THEN */
/* FIND NEW COMMENT */
/* DO: */
/* BEGIN=COMMENT("" "") ; */
/* IF BEGIN= "" THEN */
/* END=COMMENT("" "") ; */
/* ELSE RETURN: */
/* END=COMMENT("" "") ; */
/* END=COMMENT("" "") ; */
/* END: */
/* END: */
```