

FROM END USER TO SAS® SOFTWARE PROGRAMMER

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Abstract

Corporations are rapidly becoming more dependent on computer database usage in their daily business operations. Database management and retrieval has traditionally been designated to professionally trained programmers. As the number of database end users is increasing so is the magnitude of the work effort required from programmers. SAS ASSIST® allows end users the ability to comfortably manage their data, create reports, do elementary statistics, and produce statistical graphics. SAS ASSIST produces the syntactically correct program statements required to perform each necessary task. Thus there is a decrease in the work load for the programmers, and due to the end users specialized knowledge of their data an increase in personal data management resulting in more timely accurate proficient data retrieval.

Introduction

Computers, software, and database management are rapidly becoming an integral part of our lives on both the personal and the professional platform. In the professional arena each individual employee either has his or her own computer work station or has direct access to an institutional terminal system. Thus there is a resulting increase in the need for technical assistance and programmer support. Corporations are noting an equal increase in the need for the employment of computer programmers and technical support personnel. At the same time end users are experiencing programmer and technical support interaction and assistance to be at a premium. It is quickly becoming vitally necessary for the end user to develop expanded computer knowledge and programming expertise for use in self supported data management activities and computer operation.

The SAS ASSIST point and click format presents the end user with complete data management capabilities. It specifically allows for the initiation of programming statements once only built and executed by professionally trained programmers. The point and click selection system facilitates the end user in creating a programming statement by a software directed order of selections while the SAS system writes the code behind the scenes placing the components in the correct order using appropriate syntax necessary to produce an accurate program statement.

The SAS system is a task oriented menu driven system which provides for varying levels of computer experience. After a short introduction to the basic components of database structure, creation, management and programming the end user can comfortably and accurately manage the data using SAS ASSIST.

The basic tools for data management and analysis are provided to produce reports, statistical graphs, and elementary statistics.(Figure 1)

As the end user becomes more familiar with the process of creating data statements and gains more understanding of the total concept, the behind the scenes programming code can be viewed in the log. Each separate point and click selection of a program statement element in the various SAS windows assists in generating the resulting programming code in the log window.(Figure 2 - 5) Viewing the completed program statement in the log window allows the end user to learn and understand more about the basis of programming.

(Figure 6)

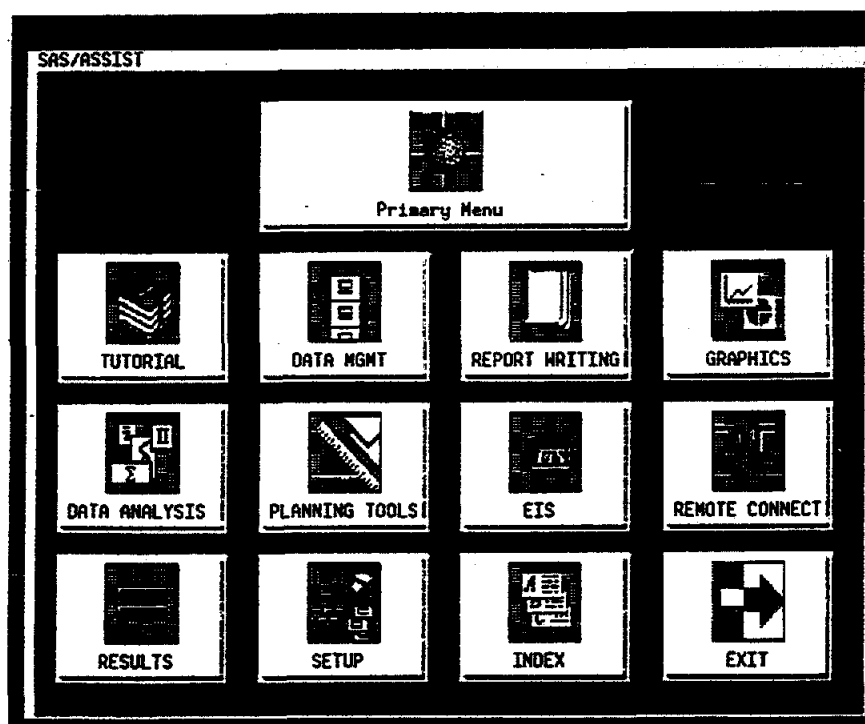


Figure 1:
Primary Menu - SAS ASSIST
 Choose function to be performed
 reports, statistics, graphs

Figure 2:
Report Writing
 Choose data set, type of subsetting, variables,
 customization, additional options

Figure 3:
 Building a Where clause - one type of subsetting

SAS/ASSIST: Additional Options

To make a selection, place cursor and press ENTER.
Use OK to save selections. Cancel to return without saving selections.

Variable/Labeling options:

Specify labels:	NO	Forest columns:	NO
Identify observations:	-NONE-	Summary variables:	-NONE-

Subsetting options:

Print subtotals:	-NONE-
Page breaks:	-NONE-

General options:

☐ Round values.	☐ Print observation number.
☐ Double space.	☐ Forest pages uniformly.
☐ Print number of observations.	
☐ Suppress labels.	

OK Cancel OK Help

None Customized Backspace Forward Print menu Setup Help

Figure 4:
Additional Options that can be chosen

SAS/ASSIST: Customize Output Appearance

Change output appearance by modifying one of the following selections.
To make a selection, place cursor and press ENTER.
Use Go back to return.

Customize

Titles...	Report	-ALL-			
Footnotes...					
Page dimensions...					
Page headings...					

Go back Help

Var 2	Var 3	Var 4	Var 5
.	.	.	.
.	.	.	.
.	.	.	.

Additional options

None Customized Backspace Forward Print menu Setup Help

Figure 5:
Customization

```
options linesize=80 pagesize=57 date number pageno=1;
title;
footnote;

title1 "FONTAN SURGERY";
proc print data=APPL1.S1757900
    label n
    ;
    var CLINIC DOB SEX;
run;
```

Figure 6:
Viewing the log - resulting programming code

The resulting program statements in the log window can be saved into the results window to be recalled at a later date.(Figure 7-8) This will eliminate the repeated building of the same or similar programming statements. It also allows the end user the ability to make changes or additions to the already existing program. Some examples of changes are adding more variables, adding a title statement, changing the data set, adding a by statement, or adding a where clause.

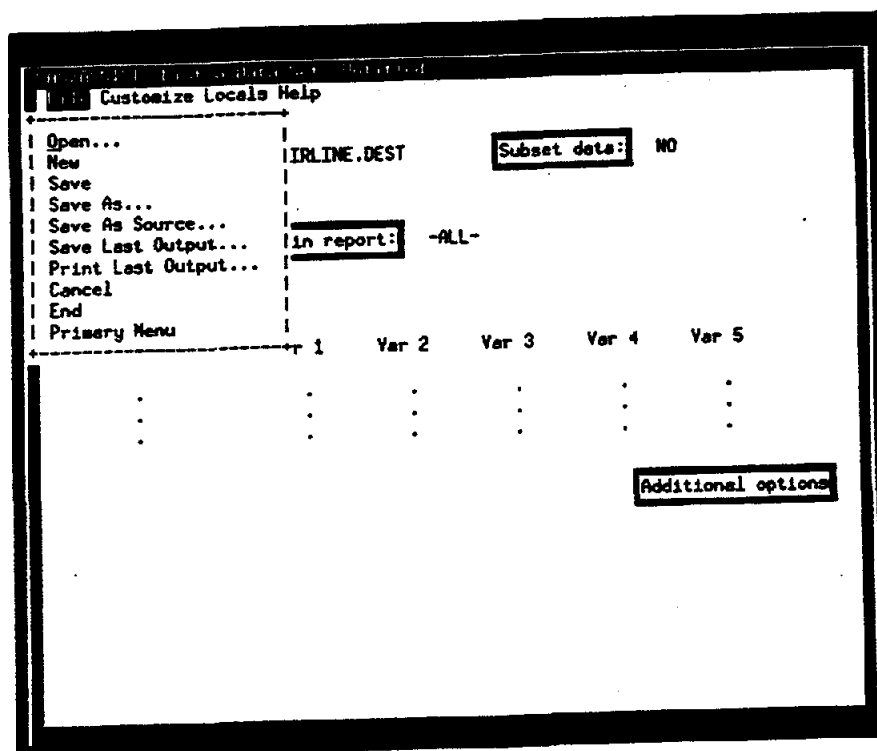


Figure 7:
Saving into Results by saving the source

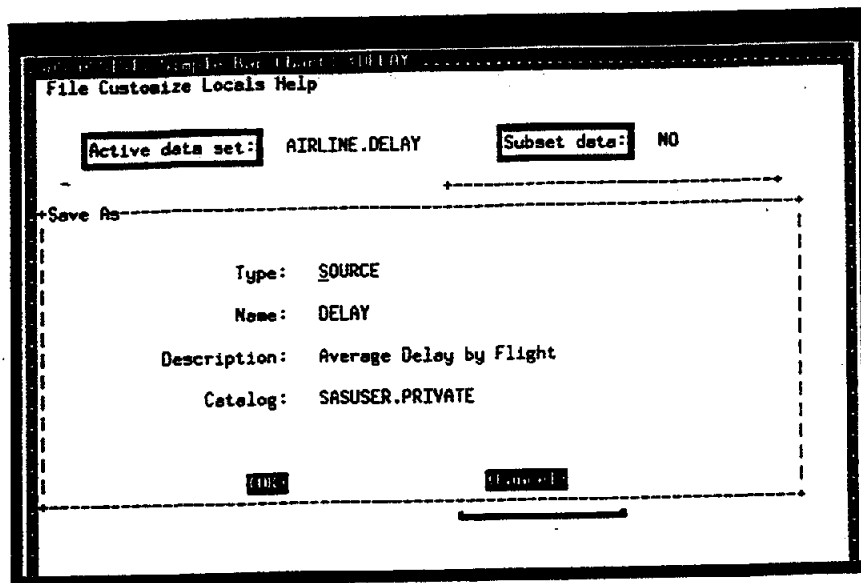


Figure 8:
Saving into Results allows for naming and a description

The program can then be run from the results window to produce a new set of output reflecting the additions or changes. This allows the end user efficient reuse of existing programs.(Figure 9 - 15)

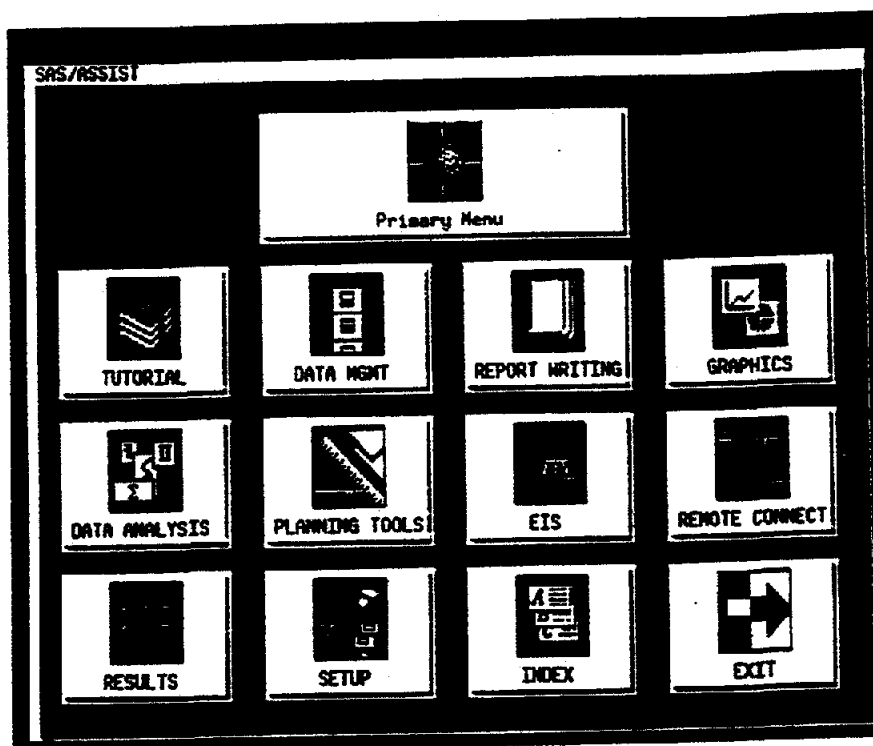


Figure 9:
Primary Menu to Results to Results Manager

SAS/ASSIST: Result Manager
File Edit View Locals Help

Catalog: SASUSER.PRIVATE Name: Type: ALL

Row: 1 to 13 of 13

Cad	Name	Description	Type	Date
---	BUILD1	Custom Building Data	ASSIST	07/18/95
---	BUILD2	Mortgage Data	ASSIST	07/18/95
---	FITNESS	Fitness Data 1	ASSIST	07/18/95
---	FITNESS2	Fitness Data 2	ASSIST	07/18/95
---	HOUSLST	Printout of Housing Data	ASSIST	07/24/95
---	SALES	July Sales	ASSIST	07/18/95
---	TEST	August Sales	ASSIST	07/18/95
---	TEST4	August 15 Flight Data	ASSIST	07/18/95
---	FITNESS	June 2 Flight Data	QUERY	07/18/95
---	FLY	Airline query 8/24	QUERY	08/24/95
---	QWARCH1	March data with prompt	QUERY	08/24/95
---	TRIJOIN	Joining three tables	QUERY	08/26/95
---	BONUS	Annual bonus data	REPORT	07/18/95

Figure 10:
Results Manager - list of all saved programs

SAS/ASSIST: Result Manager
File Edit View Locals Help

Catalog: SASUSER.PRIVATE Name: Type: ALL

Row: 1 to 13 of 13

Cad	Name	Description	Type	Date
B	Browse	Building Data	ASSIST	07/18/95
C	Copy	le Data	ASSIST	07/18/95
D	Delete	l Data 1	ASSIST	07/18/95
E	Edit	l Data 2	ASSIST	07/18/95
F	File	lt of Housing Data	ASSIST	07/24/95
L	Batch execution	lles	ASSIST	07/18/95
P	Print	lSales	ASSIST	07/18/95
R	Rename	l15 Flight Data	ASSIST	07/18/95
V	Verify delete	lFlight Data	QUERY	07/18/95
X	Execute	l query 8/24	QUERY	08/24/95
---		ata with prompt	QUERY	08/24/95
---	TRIJOIN	Joining three tables	QUERY	08/26/95
---	BONUS	Annual bonus data	REPORT	07/18/95

Figure 11:
Results Manager - task choices - edit allows for changes
to existing program

```

options linesize=74 pagesize=19 date number pageno=1;
title;
footnote;

title1 "DAVID PROCEDURE";
title2 "CLINIC NUMBER ORDER";
title3 "CLINIC NUMBER, NAME,DATE OF BIRTH,AND DATE OF SURGERY";
proc print data=APPL1.S1757900
    label n
    ;
    var CLINIC DOB SEX;
run;

```

Figure 12:
Example 1 - Log from Results Manager

```

options linesize=74 pagesize=19 date number pageno=1;
title;
footnote;

title1 "DAVID PROCEDURE";
title2 "CLINIC NUMBER ORDER";
title3 "CLINIC NUMBER, NAME,DATE OF BIRTH,AND DATE OF SURGERY";
proc print data=APPL1.S1757900
    label n
    ;
    var CLINIC DOB SEX;
        where
        PERIOP=1;
run;

```

Figure 13:
Example 1 - Log from Results Manager after Where Clause
has been added to preexisting program

```
data WORK.A;
  set APPL1.S1757900;
  length FONTAGE 8;
  FONTAGE = fontdt-dob;
  label FONTAGE = 'age at fontan';
  length BDCPAAGE 8;
  BDCPAAGE = cavodt-dob;
  label BDCPAAGE = 'age at glenn';
  length GLENTFON 8;
  GLENTFON = fontdt-cavodt;
  label GLENTFON = 'time from glenn to fontan';
  length LASTFOLL 8;
  LASTFOLL = contact-fontdt;
  label LASTFOLL = 'time from fontan to last contact';
run;
```

Figure 14:
Example 2 - Log from Results Manager

```
data WORK.A;
  set APPL1.S1757900;
  where
  PERIOP=1;
```

```
data WORK.A;
  set WORK.A;
  length FONTAGE 8;
  FONTAGE = fontdt-dob;
  label FONTAGE = 'age at fontan';
  length BDCPAAGE 8;
  BDCPAAGE = cavodt-dob;
  label BDCPAAGE = 'age at glenn';
  length GLENTFON 8;
  GLENTFON = fontdt-cavodt;
  label GLENTFON = 'time from glenn to fontan';
  length LASTFOLL 8;
  LASTFOLL = contact-fontdt;
  label LASTFOLL = 'time from fontan to last contact';
run;
```

Figure 15:
Example 2 - Log from Results Manager after Where Clause
has been added to preexisting program

Conclusion

As we continue to advance into the future it becomes increasingly necessary for each individual end user to have increased control and management of their own databases with minimal programmer support. This frees the computer programmer to support an increased number of end users. It also saves the corporations added programmer personnel expenses. The end users exclusive knowledge of the data results in personal data administration, improved accuracy and proficiency of data retrieval, and more expeditious production of results and conclusions.

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References

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Figures 1 - 5 and Figures 7 - 11

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