

Paper 161-25

Creating A Point and Click Interface: An Example

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Amadeus Software

Abstract

Amadeus wrote a suite of products designed to enable users to create a wide variety of reports with an easy to use point and click interface. A SAS Solution for Business that complements and enhances your SAS Desktop.

i-report consists of an addition to your SAS Desktop Toolbar that gives you access to four screens:

1) The Tabulator creates cross-tabulations from SAS datasets without the need for programming. An easy to use Point and Click interface controls the generation of tables, allowing you to save and retrieve table definitions and set a wide variety of table options.

2)The Graphics Generator allows users to create a wide variety of graphics from SAS datasets. Users can view, save and print the graphics that are created. Graphics definitions can be saved and retrieved for later use.

The Toolkit brings business solutions to a wide variety of users, with clear, concise, intelligent screens designed for ease of use and containing extensive functionality.

3)The List Reporter allows users to create a wide variety of essentially sequential list style reports, with options to group data, order data and set options such as boxes, lines, summaries and formats. Reports can be saved and retrieved at a later date.

4)A Format Editor, which allows users to alter formats interactively.

Tabulator Version 2.2

Introduction

The Amadeus Tabulator is used as part of your SAS Desktop. It provides an easy-to-use point and click interface to creating tables from your data.

The Tabulator requires Base SAS Software Version 6.12 to run and runs under the Windows Operating System.

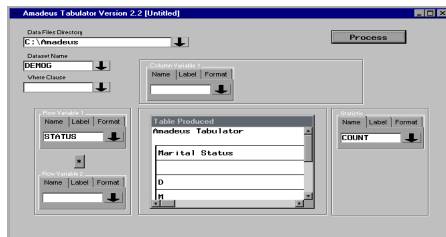
Walkthrough

The Tabulator is started from the Desktop through an item on your toolbar:



The Tabulator has a main screen that allows you to choose the directory where your data is stored and select the dataset name.

One item is required for a basic table and this row variable can be selected from a popup list.



The Tabulator has its own toolbar, which has the following functionality:



Table Definitions allow you to save and load various aspects of the

table, such as the variables chosen, their formats, labels and positions. Report options that are selected are saved along with any titles and footnotes that may be set for the table

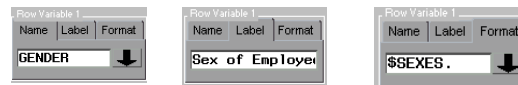
Table Code allows you to save the table that is created as a text file.

Utilities allow you to view the table in a larger screen mode (print preview), and also control the selection of printers, fonts, page orientation and margins.

Report Options is a separate screen giving options such as totalling, page settings, labelling, and various other table specific choices.

Built in intelligence

The main screen has several automatic aspects which can be extremely useful for users.



Selection of a variable causes the screen to pick up any labels or formats that may be held in the data header. Formats can be selected from a list of formats held in a SAS catalog.

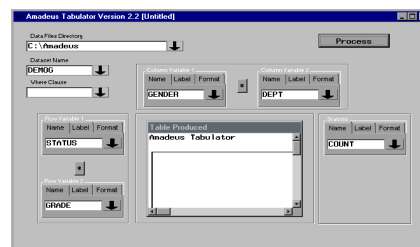
A 2 by 2 Table

Selecting 2 row variables and 2 column variables allows selection of the method of joining the 2 variables. Notice the asterisk between the 2 variable names.

An asterisk between the 2 variable names indicates a nesting of the 2 variables

A space between the 2 variable names indicates a concatenation of the 2 variables.

Each variable selection will pick up any labels or formats from the dataset header.



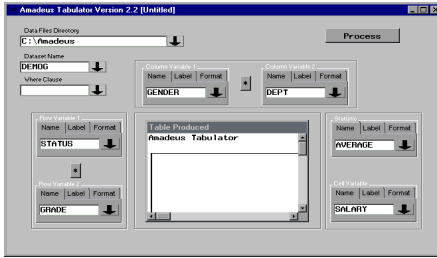
The table has the following form:

		Sex of Employer					
		FEMALE					
		Department					
		A	B	C	D	E	F
Marital Status	Grade						
D	low	.	.	.	.	.	1
	high	.	.	.	.	.	.
H	low	.	.	.	.	.	1
	high	3	4	.	2	1	9
P	low	2	2	1	4	.	.
	high	1	.	.	.	.	1
B	low	.	1	1	.	.	.
	high	.	.	.	.	.	.
M	low	2	1	.	2	.	2
	high	.	.	.	.	1	.
	low	1	.	.	.	.	1
	high	.	.	.	.	.	.

Notice the table extends across to the right.

Selecting Statistics

The Statistics selection prompts the user to select a variable for the cell values:



Selection of labels and formats is also available for the cell variable and the statistic.

Marital Status	Grade	Sex of Employee		Department						Average Salary	
		Female	Male	A	B	C	D	E	F		
D	low	-	-	-	-	-	-	-	-	-	11000
D	high	-	-	-	-	-	-	-	-	-	539
R	low	2814	19151	-	24552	47520	22760	26430	303	-	125
R	high	14361	10851	13040	12933	-	-	10101	-	-	113
P	high	16975	-	-	-	-	-	-	-	-	37691
S	low	-	14512	10513	-	-	-	-	-	-	303
S	high	13125	14990	-	12963	-	-	12675	11300	109	-

Using the Nesting Button

Pressing the nesting button causes a space to appear instead of an asterisk:

The difference in the report demonstrates the concatenation capability:

Marital Status	Grade	Sex of Employee		Department						Average Salary	
		Female	Male	A	B	C	D	E	F		
D	low	-	11000	11000	-	-	-	-	-	-	-
D	high	-	30297	-	53971	21080	15841	-	-	-	-
R	low	-	13958	-	12560	12672	-	-	-	-	140
R	high	25574	26370	20261	26030	28460	23180	27153	257	-	-
R	low	13520	12841	14361	10914	13060	12956	14361	193	-	-
P	high	16975	28170	27280	-	27961	15069	-	-	-	-
S	low	12513	13000	-	14512	10513	-	-	-	-	130
S	high	-	28444	-	30324	18601	28720	22355	-	-	-
M	low	13307	11764	12213	12905	11316	12802	12978	126	-	-
M	high	47571	23093	23020	-	-	-	-	-	-	47571
	low	14621	-	14621	-	-	-	-	-	-	-

Totals and Sub-Totals

To illustrate this capability, we create a 1 by 1 table with a cell variable.

Marital Status	Grade	Sex of Employee		Department						Average Salary	
		Female	Male	A	B	C	D	E	F		
D	low	-	11000	11000	-	-	-	-	-	-	-
D	high	-	30297	-	53971	21080	15841	-	-	-	-
R	low	-	13958	-	12560	12672	-	-	-	-	140
R	high	25574	26370	20261	26030	28460	23180	27153	257	-	-
R	low	13520	12841	14361	10914	13060	12956	14361	193	-	-
P	high	16975	28170	27280	-	27961	15069	-	-	-	-
S	low	12513	13000	-	14512	10513	-	-	-	-	130
S	high	-	28444	-	30324	18601	28720	22355	-	-	-
M	low	13307	11764	12213	12905	11316	12802	12978	126	-	-
M	high	47571	23093	23020	-	-	-	-	-	-	47571
	low	14621	-	14621	-	-	-	-	-	-	-
TOTAL		18356	22750	21303	-	-	-	-	-	-	-

The row and columns totals are generated automatically:

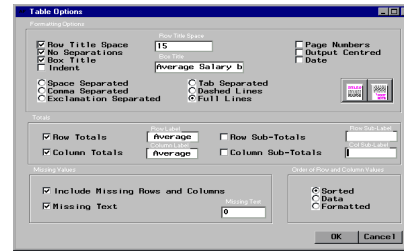
Marital Status	Grade	Sex of Employee		Department						Average Salary	
		Female	Male	A	B	C	D	E	F		
D	low	-	11000	11000	-	-	-	-	-	-	-
D	high	-	31027	-	53971	21080	15841	-	-	-	-
R	low	-	13958	-	12560	12672	-	-	-	-	140
R	high	25574	26370	20261	26030	28460	23180	27153	257	-	-
R	low	13520	12841	14361	10914	13060	12956	14361	193	-	-
P	high	16975	28170	27280	-	27961	15069	-	-	-	-
S	low	12513	13000	-	14512	10513	-	-	-	-	130
S	high	-	28444	-	30324	18601	28720	22355	-	-	-
M	low	13307	11764	12213	12905	11316	12802	12978	126	-	-
M	high	47571	23093	23020	-	-	-	-	-	-	47571
	low	14621	-	14621	-	-	-	-	-	-	-
TOTAL		18356	22750	21303	-	-	-	-	-	-	-

Using the Table Options Button

The Table Options Button allows users to change the appearance of the report in many different ways:

Supply labels for the row and columns totals, and change some of

the other options to suit:

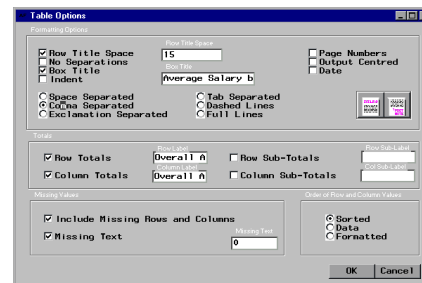


The report still needs some further refinement with the widths of each column and some formatting for the STATUS variable.

Marital Status	Grade	Sex of Employee		Department						Average Salary	
		Female	Male	A	B	C	D	E	F		
D	low	-	11000	11000	-	-	-	-	-	-	-
D	high	-	30297	-	53971	21080	15841	-	-	-	-
R	low	-	13958	-	12560	12672	-	-	-	-	140
R	high	25574	26370	20261	26030	28460	23180	27153	257	-	-
R	low	13520	12841	14361	10914	13060	12956	14361	193	-	-
P	high	16975	28170	27280	-	27961	15069	-	-	-	-
S	low	12513	13000	-	14512	10513	-	-	-	-	130
S	high	-	28444	-	30324	18601	28720	22355	-	-	-
M	low	13307	11764	12213	12905	11316	12802	12978	126	-	-
M	high	47571	23093	23020	-	-	-	-	-	-	47571
	low	14621	-	14621	-	-	-	-	-	-	-
TOTAL		18356	22750	21303	-	-	-	-	-	-	-

Using Further Table Options

In this example, comma separated values have been selected, and titles and footnotes have been created.



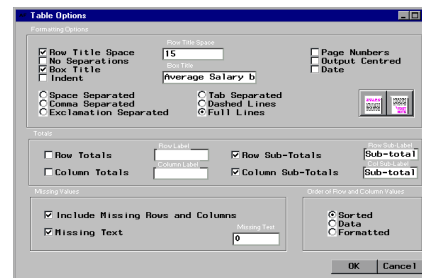
The table can be saved to a text file and then opened in a spreadsheet for further work. Use the comma delimiter to read this text file.

Row and Column Sub-Totals

By selecting a 2 by 2 table, we can create sub-totals for the nested variables.

Marital Status	Grade	Sex of Employee		Department						Average Salary	
		Female	Male	A	B	C	D	E	F		
D	low	-	11000	11000	-	-	-	-	-	-	-
D	high	-	30297	-	53971	21080	15841	-	-	-	-
R	low	-	13958	-	12560	12672	-	-	-	-	140
R	high	25574	26370	20261	26030	28460	23180	27153	257	-	-
R	low	13520	12841	14361	10914	13060	12956	14361	193	-	-
P	high	16975	28170	27280	-	27961	15069	-	-	-	-
S	low	12513	13000	-	14512	10513	-	-	-	-	130
S	high	-	28444	-	30324	18601	28720	22355	-	-	-
M	low	13307	11764	12213	12905	11316	12802	12978	126	-	-
M	high	47571	23093	23020	-	-	-	-	-	-	47571
	low	14621	-	14621	-	-	-	-	-	-	-
TOTAL		18356	22750	21303	-	-	-	-	-	-	-

When sub-totals are requested, the totals options are turned off. Users can switch these back on if required. Duplication of total columns or rows can occur if both these options are selected.



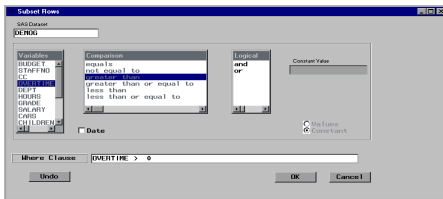
Sub-Totals for rows and columns are generated:

Marital Status	Department	Sex of Employees						Sub-total		
		FEMALE			MALE			high	low	
		high	low	Sub-total	high	low	Sub-total			
A	0	0	0	0	11000	11000	0	11000	11000	
B	0	0	0	0	11000	11000	0	11000	11000	
C	0	0	0	0	15841	15841	0	15841	15841	
D	0	0	0	0	14840	14840	0	14840	14840	
Sub-total	0	0	0	0	30297	13358	21827	30297	13358	21827

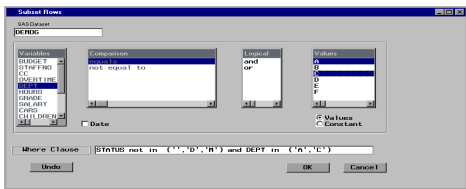
The Where Clause

The Where Clause gives users additional control over which observations are selected for the table.

Sub-setting is available for numeric variables by selecting from a series of values or typing in a value:



Sub-setting is also available for character values, either by typing in a value or selecting from a series:

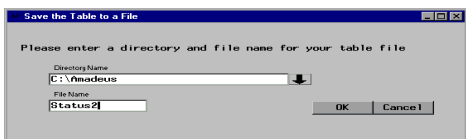


Some values of STATUS and DEPT have been selected and the table shows only those values drawn out by the Where Clause:

Marital Status	Department	Sex of Employees				Sub-total	
		FEMALE		MALE		high	low
		high	low	high	low		
A	0	16975	0	32501	0	0	
C	0	18510	22901	0	0	0	
D	0	18125	0	11000	0	0	
M	0	18521	23023	0	0	0	

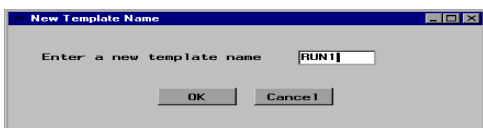
Saving the Table

The table can be saved to a file for further processing:



Saving the Table Template

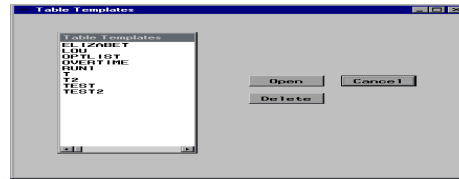
The definition of the table can be saved to a template. This facility enables a user to save the variables selected, the options selected and any titles and footnotes that may have been defined. Selections are saved to a template and these selections can be loaded back into the Tabulator at another time.



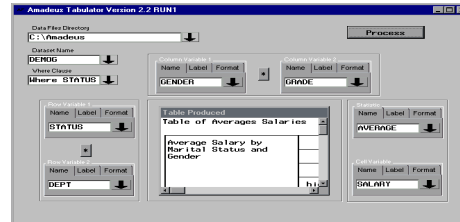
Reset the Tabulator and Load a template

Use the New button to clear selections. The Load Template button

allows selection from any saved templates that a user may have:



RUN1 has the following selections.



Amadeus Graphics Generator Version 2.2

Introduction

The Graphics Generator is used as part of your SAS Desktop. It provides an easy-to-use point and click interface to creating graphics from your data.

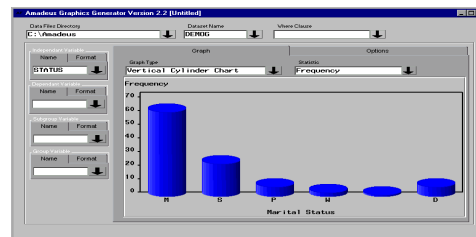
The Graphics Generator requires Base SAS Software and SAS/GRAPH Software Version 6.12 and runs under the Windows Operating System.

Walkthrough

The Graphics Generator is activated from the Desktop through an item on your toolbar:



The Graphics Generator has a main screen that allows you to choose the directory where your data is stored and select the dataset name:



The Graphics Generator has its own toolbar, which will have the following functionality:

New Open Save Save View Preview Print Graph End

Definition Graph Log Setup Options



Graph Definitions allow you to save and load various aspects of the graph, such as the type of graph, the statistics chosen, and various options such as sort order and legends.

Graph Save allows you to save the graph in many formats eg bmp, tif, gif, SAS

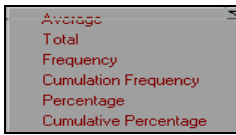
Utilities allow you to view the graph in a larger screen mode (print preview), and also control the selection of printers, fonts, page orientation and margins.

Built in intelligence

Selecting the sum and frequency adjusts the graph selections for the user. For example, a regression plot requires X and Y variables. A vertical bar chart requires one variable for the horizontal axis.

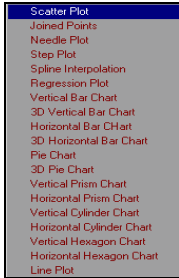
Statistics

Several statistics are currently available for display

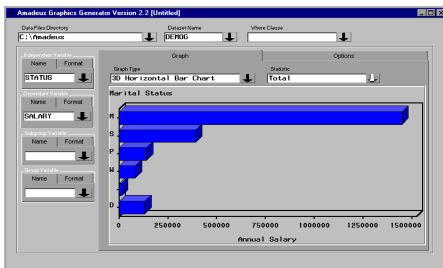


Types of Graphs

Many different types of graphs are available, including the following:

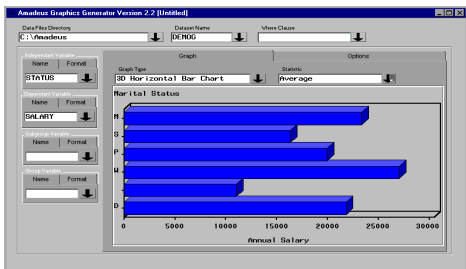


Selecting 3D Horizontal Bar Chart with total statistic



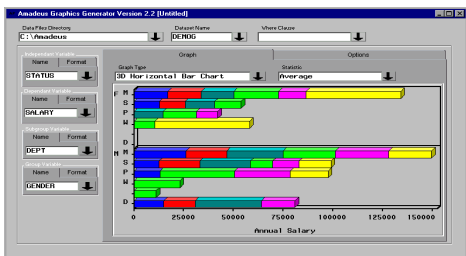
Salary has been selected for display along the horizontal axis.

Selecting Average:



Using Goup and Sub-Group Selections

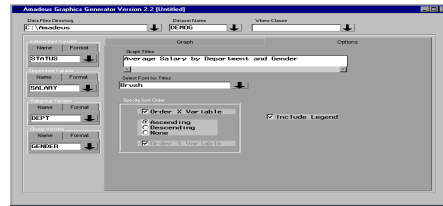
Sub-Group divides the bars into sections, while group gives 2 charts, one for each value of gender in this case.



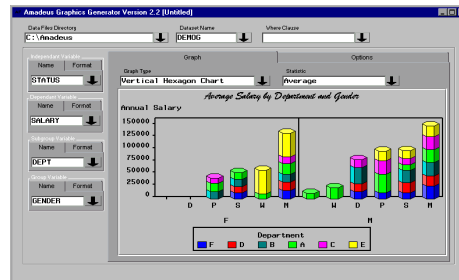
Changing the chart type to Vertical Hexagon Chart:

Graph Options

The graph is given a title, a legend is requested and the order of bars is changed:

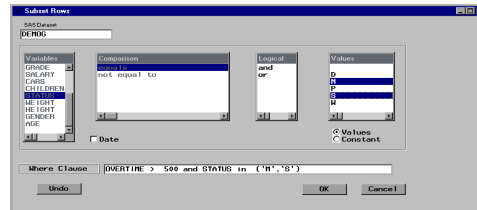


Other options will be added for the production release.



Where Clause

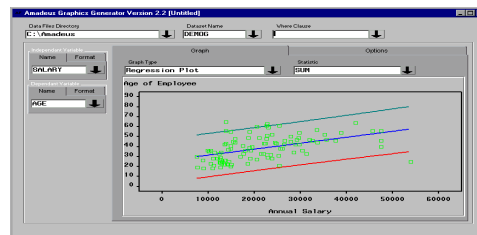
The user can select the where clause screen to provide further control over which observations are selected for the graph:



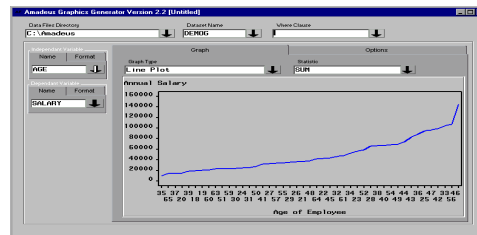
Here, 3D Pie Chart has been selected and the title changed.

Plotting Data

Regression plots can be used for investigating the data:



A Line Plot:



Amadeus List Reporter

Introduction

This paper describes a customised front end, created using SAS® Software, to enable simple and efficient production of SAS reports. This has been achieved by using Advanced Frame Technology.

The system is designed so that different reporting requirements can be included into the application easily and effectively.

System Development and Demonstration

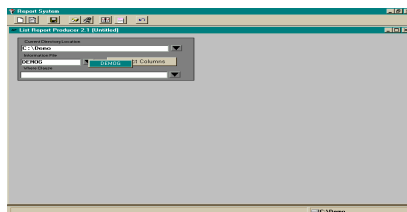
The List Reporter System has been written with SAS/AF® software using the SAS System Release 6.12 under Microsoft Windows. The initial requirements of the system were as follows.

1. The system must be an entirely point and click application
2. The users must have the ability to save the SAS code, and the final report to a location of their choice.
3. The users must also be able to re-load a previously designed report.
4. The system must be easily adaptable to cope with a rapidly changing business environment.

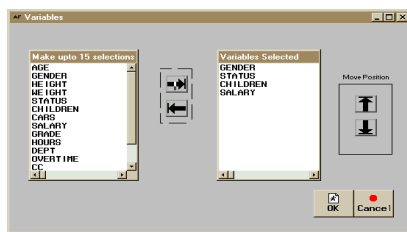
The system can be installed on a Network Server or on a local Disk. When a table is produced the user has the ability to save the information locally or to a network drive.

An example walk-through of creating a list report

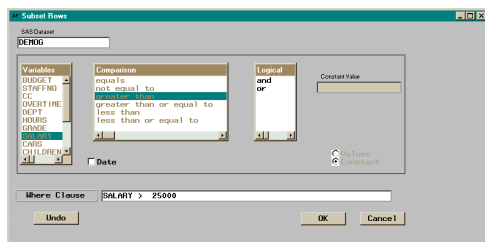
The first stage of producing the report is to select the SAS dataset that holds the information required for the report.



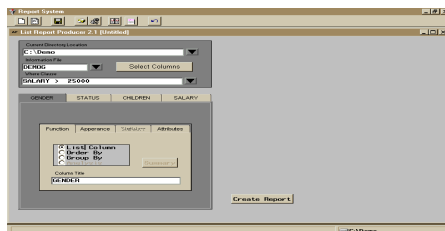
The user selects the variables required in the report. The order of the variables must also be set here.



The user also has the ability to produce the report on a sample or subset of the data.



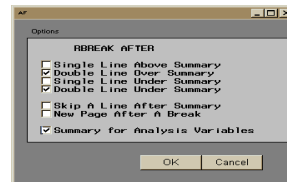
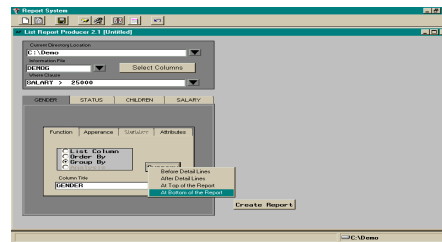
The basic report outline is now complete.



To enhance the structure of the report, the user has the ability to change the definitions of the variables and apply formats i.e. to

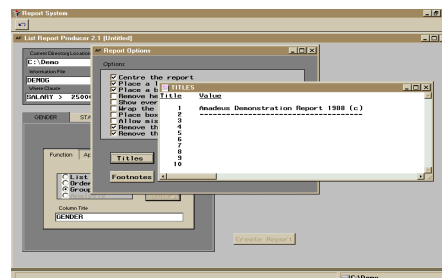
produce a grouping report.

In this example the variables GENDER and STATUS have been initialised as grouping variables. This automatically sets the numeric variables in the report to be ANALYSIS variables with a default of the N statistic.



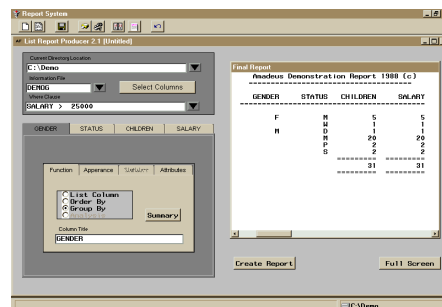
A summary may also now be added to the report.

Finally, the user sets some GLOBAL report options such as the TITLE / FOOTNOTES etc.

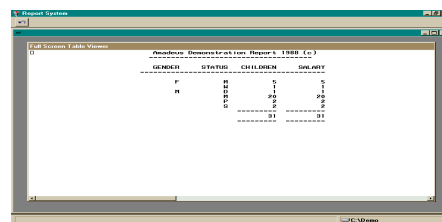


The Global report options screen is accessed from the main toolbar.

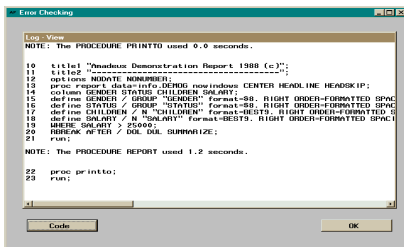
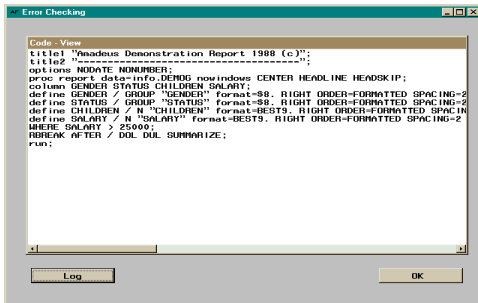
Now press the create report button to generate the report.



The user can view the new report in full screen mode.



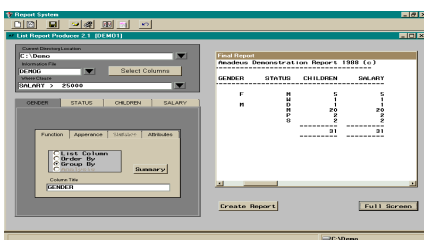
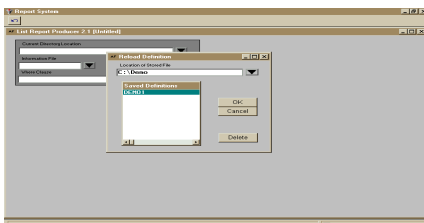
The LOG run and the code can also be viewed, by pressing the VIEW LOG/ CODE button from the main toolbar.



Finally the user can save the code, table and definition to a location of their choice by selecting the SAVE button.



The user may now load the code into the PROGRAM EDITOR and re-run the report in batch mode. The report can be loaded into a spreadsheet or word processor for further refinement, and the definition can be used to return the user to the current report screen setup at any time, by selecting the RELOAD button on the main toolbar.



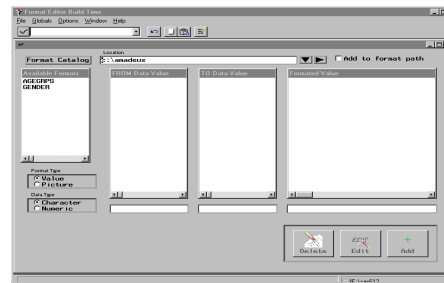
Amadeus Format Editor

Introduction

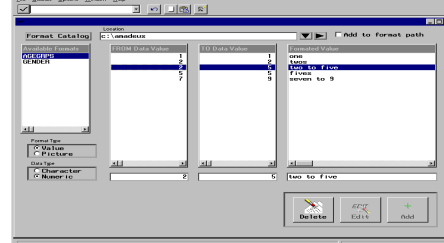
The Format Editor is a SAS/AF screen that can be added to your SAS Desktop. It allows on-line editing and creation of SAS Formats within an easy to use Point and Click interface. Users can view the format definitions of an existing format, change those definitions and re-create the format. Users can also create new formats with the Editor.

Walkthrough

The formats editor has a main screen that allows you to choose the directory where your formats are stored.



Select the format you wish to edit and type in a new value.



Other format editor abilities include.

- Select the location of the formats via the normal windows DLGCDIR.
- Add library's to the current fmtsearch option.
- Edit both value (character and numeric) and picture formats.
- Copy an existing format i.e. using an existing one as a template.
- Create new value and picture formats from scratch.
- Export formats to a dataset.
- Create formats from a dataset.

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