

Paper 135-30

Creating and Using SAS[®] Stored Processes with SAS[®] Enterprise Guide[®]

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ABSTRACT

This hands-on workshop shows how to use SAS Enterprise Guide to create and use SAS stored processes. In particular, you will learn how to

- create a new project, run an existing stored process, and stream the results back to SAS Enterprise Guide
- add an existing SAS program to the project and use it to create, register, and test a new stored process
- add a data source to the project, run a task against it, and create, register, and test a new stored process based on that task.

INTRODUCTION

A SAS stored process is a SAS program that is hosted on a server and described by metadata. A stored process can be invoked by many of the new clients in the SAS[®]9 Intelligence Platform. A stored process is similar in concept to programs that are run by SAS/IntrNet software but is more versatile because of the underlying metadata and security support. Although there are several ways to create and register a stored process, this hands-on workshop focuses on how to use SAS Enterprise Guide for these tasks. SAS Enterprise Guide is an easy-to-use Windows application that provides an intuitive visual interface to the power of SAS, including transparent access to data, ready-to-use tasks for analysis and reporting, and the ability to easily export data to other applications.

OVERVIEW OF SAS STORED PROCESSES

Because a stored process is basically a SAS program, it can access any SAS data source or external file as input and can create multiple types of output, such as new data sets, files, and report output in a variety of formats. There are some advantages to using a stored process over using a traditional SAS program. For example, code is not embedded in client applications; it is stored on a server. This enables you to centrally maintain, manage, and secure the code. Another advantage is that stored processes can be invoked from multiple types of clients such as Web browsers and desktop applications. Because there is only one copy of the code, every client application that invokes a stored process always gets the latest version of the stored process program.

There are three basic steps to creating a stored process:

1. Write the stored process program either from scratch (using a program editor) or by taking the output of a SAS task.
2. Choose the server to execute the stored process.
3. Register the stored process metadata.

After a stored process has been created and registered, it can be invoked from several of the SAS[®]9 Intelligence Platform applications, such as SAS Enterprise Guide, SAS Add-In for Microsoft Office, SAS Information Map Studio, SAS Web Report Studio, and the SAS Information Delivery Portal.

SAS stored processes can be hosted by either the SAS Stored Process Server or the SAS Workspace Server. These two servers are similar but have different capabilities. The SAS Stored Process Server is a multi-user server that runs under a single shared user identity. This single process is shared by many clients, is dedicated to executing stored processes, and implements several features that are not available on the workspace server, such as streaming output, sessions, multiple-value input parameters, and support for stored process Web services. The SAS Workspace Server is a single-user server that runs under the client identity and starts a new server process each time a stored process is executed.

When a SAS stored process is registered, there are many metadata attributes that contain information about the stored process, such as the name, description, and keywords; input parameters to allow the stored process to be dynamic; output options to control how results are delivered; the server on which the stored process will execute; and security options.

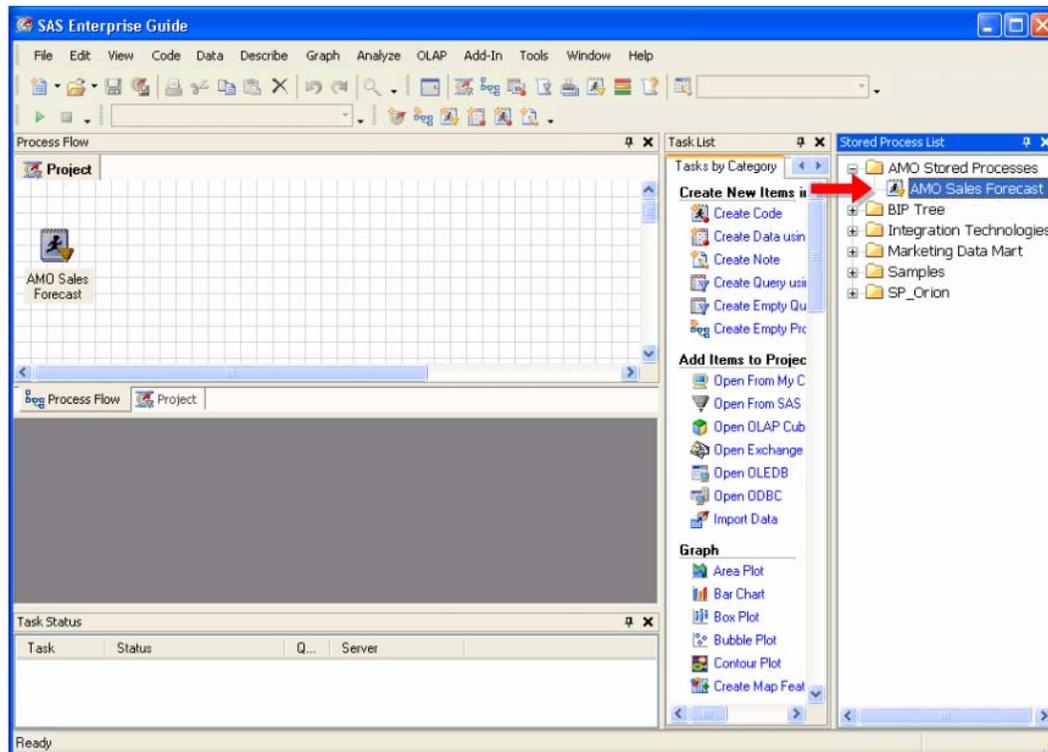
PART 1

Create a new SAS Enterprise Guide project and run an existing stored process.

1. Launch SAS Enterprise Guide by selecting **Start** ⇒ **All Program** ⇒ **SAS** ⇒ **Enterprise Guide 3.0**. In the Welcome window select **New Project**.

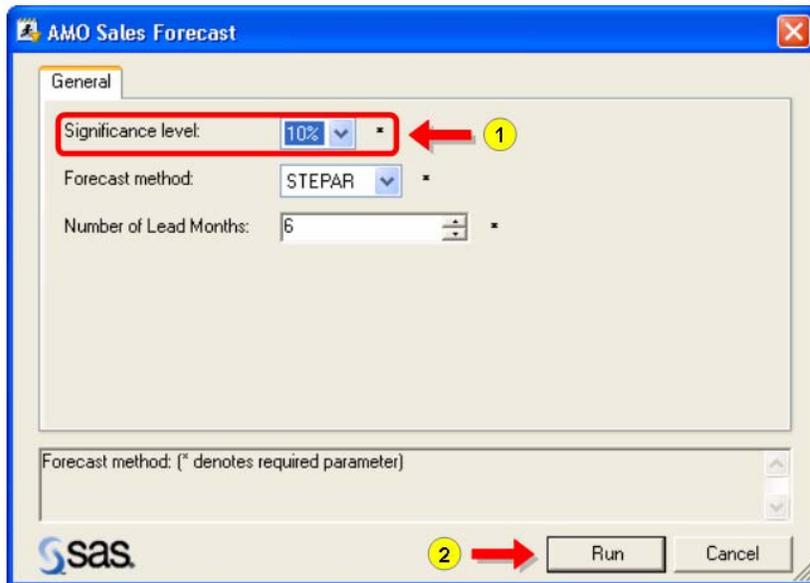


2. View the available stored processes by selecting **View** ⇒ **Stored Process List** (or by selecting  on the toolbar).
3. Expand the **AMO Stored Processes** folder and double-click the **AMO Sales Forecast** stored process to add it to the project.

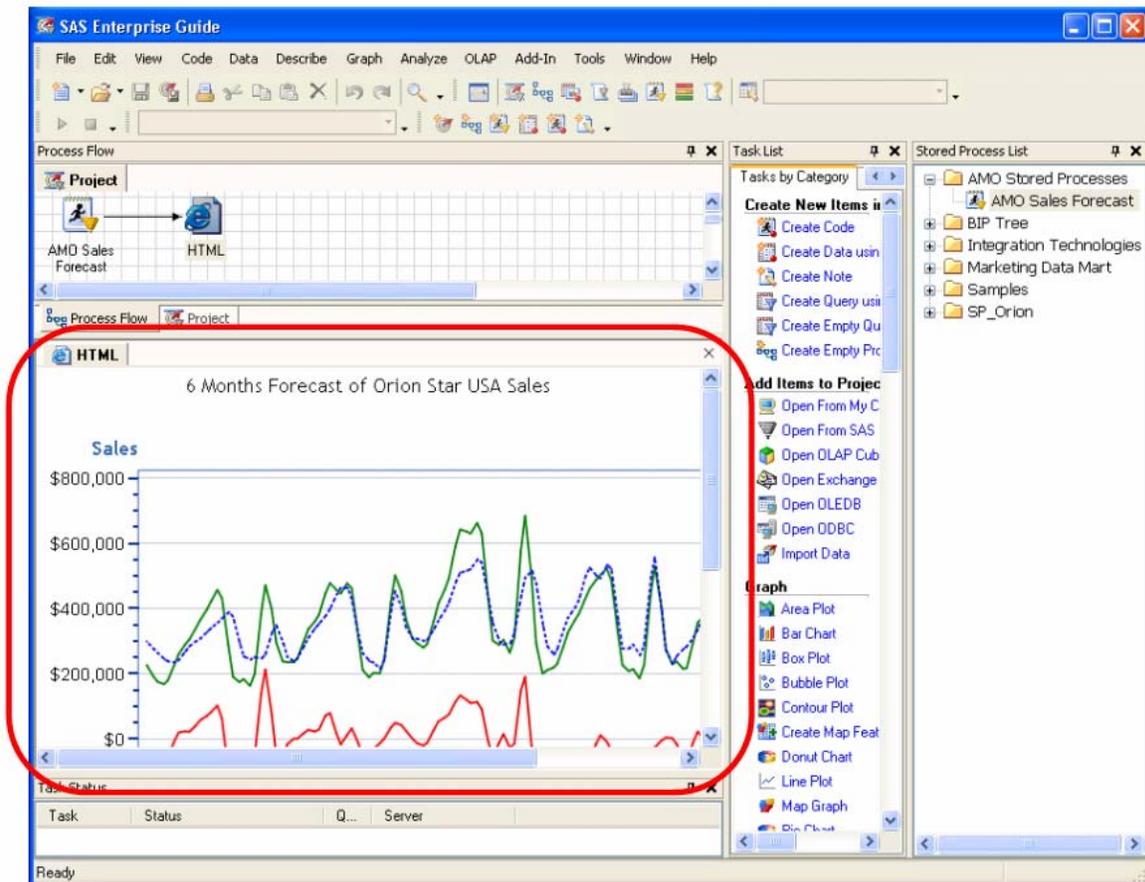


4. Run the stored process by selecting **Run This Stored Process** from the pop-up menu (or by selecting the stored process and selecting  on the toolbar).

5. Because this stored process has several parameters to make it dynamic, a parameter window is displayed. Click the down arrow next to *Significance level*, select **10%**, and click **Run**. The stored process program is run using the selected parameters.



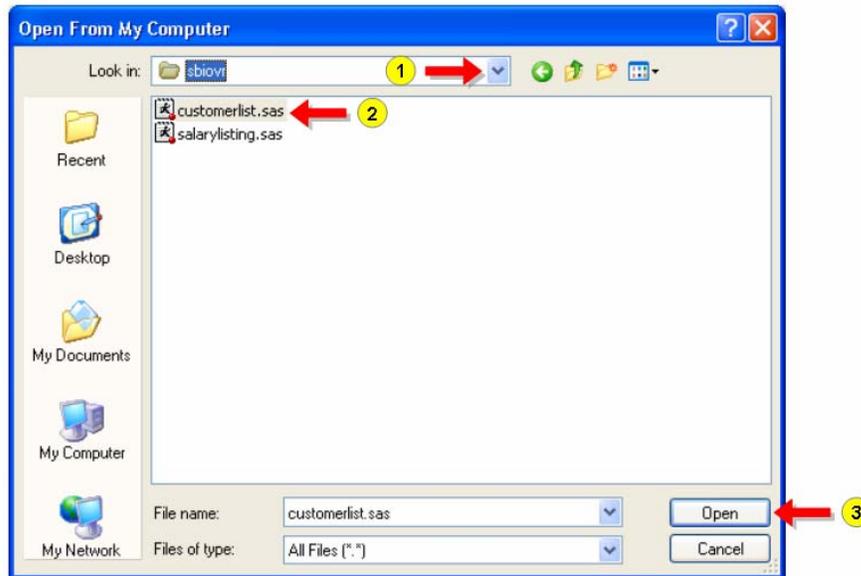
6. The results are displayed in the work area.



PART 2

Add an existing SAS program to the project and create a new stored process from it.

1. Add an existing SAS program to the project (this program is located on the local computer) by selecting **File** ⇒ **Open** ⇒ **From My Computer...**
2. Using the drop-down list in the Look in box, navigate to C:\Workshop\winsas\sbiovr, select **customerlist.sas**, and click .



The **customerlist.sas** program uses the PRINT procedure and OBS system option to print only a specific number of Orion Star Gold customers. Currently the OBS system option is specified using a %LET statement. We will remove that statement so that the number of observations can be specified using a stored process parameter.

```
%let num=20;

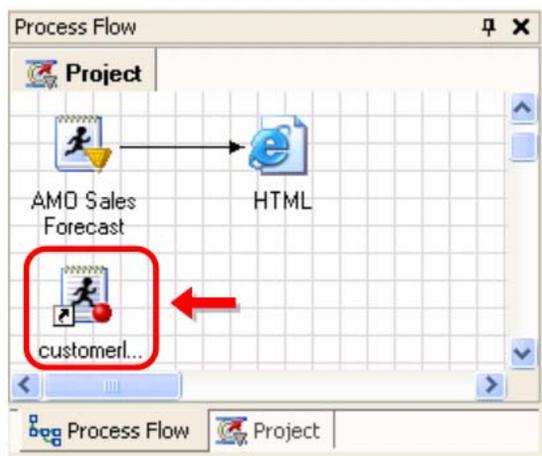
options obs=&num;
libname orgold "C:\Workshop\winsas\sbip\Orion_Star_15AUG03\orgold";

title "Listing of Orion Gold Customers";
proc print data=orgold.customer_dim label;
  var customer_name customer_id;
run;
```

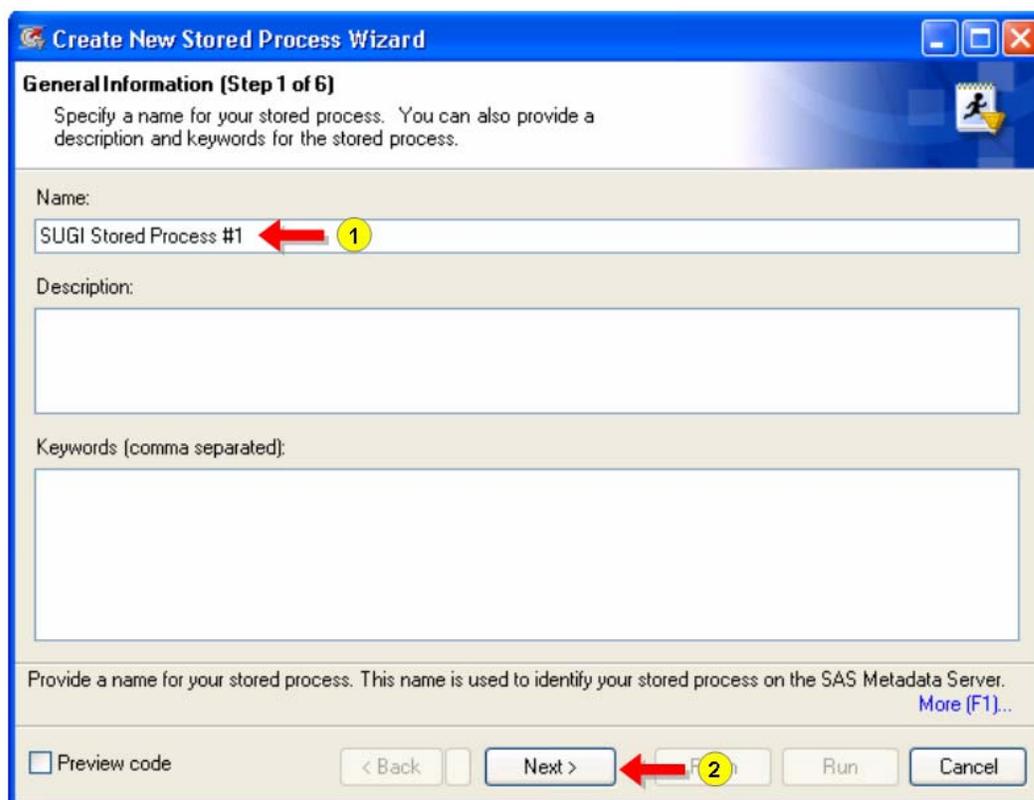
3. In the code editing area, highlight the first line (%let num=20;) and select **Delete**.



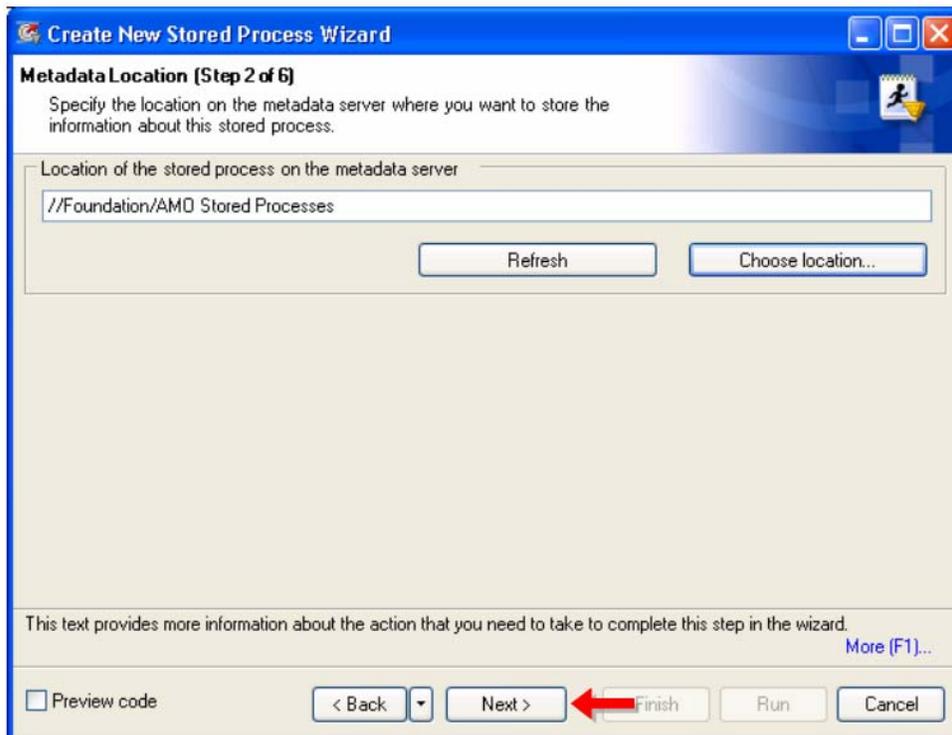
4. Select **File** ⇒ **Save customerlist.sas** to save the changes.
5. Select the program that was just added to the process flow, and select **Create Stored Process...** from the pop-up menu.

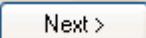


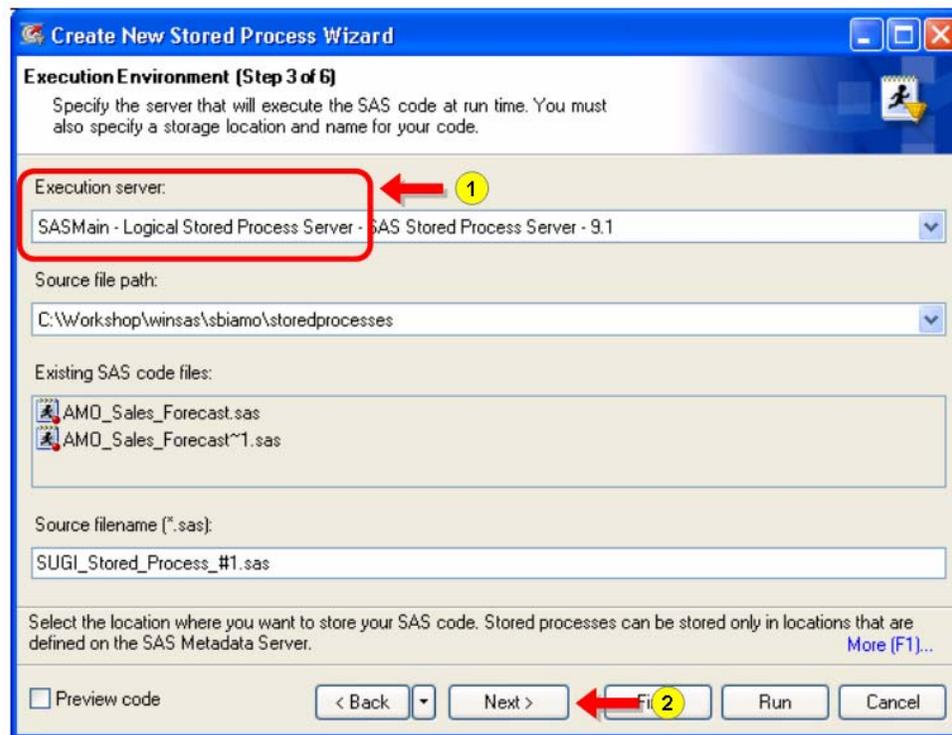
6. The Create New Stored Process Wizard opens. The first step enables you to specify descriptive information about the stored process. Type `SUGI Stored Process #1` as the Name and click **Next >**.



7. In step 2, accept the default location to store the stored process metadata and click .



8. In step 3, verify that the Execution server is set to **SASMain – Logical Stored Process Server**, accept the default Source file path and Source filename, and click .



9. Because this stored process does have a parameter (number of observations to print), we will have the wizard automatically scan the code for macro variable references. Click , then select **Parameters From SAS Code...**
10. Type **Number of Customers to Print** as the value for User prompt, select Integer as the Data type, select **Required**, and then select the **Constraints** tab.

Automatically Add Parameters from SAS Code

General Constraints

User prompt: Number of Customers to Print

SAS variable name: num

Description:

Data type: Integer

Default Value:

Location: General

Options: Expert Required Modifiable Visible

11. Select **Integer range** as the type of constraint, select **Minimum** and type 1, select **Maximum** and type 10000, select **Increment** and type 5, and then click .

Automatically Add Parameters from SAS Code

General Constraints

Integer range

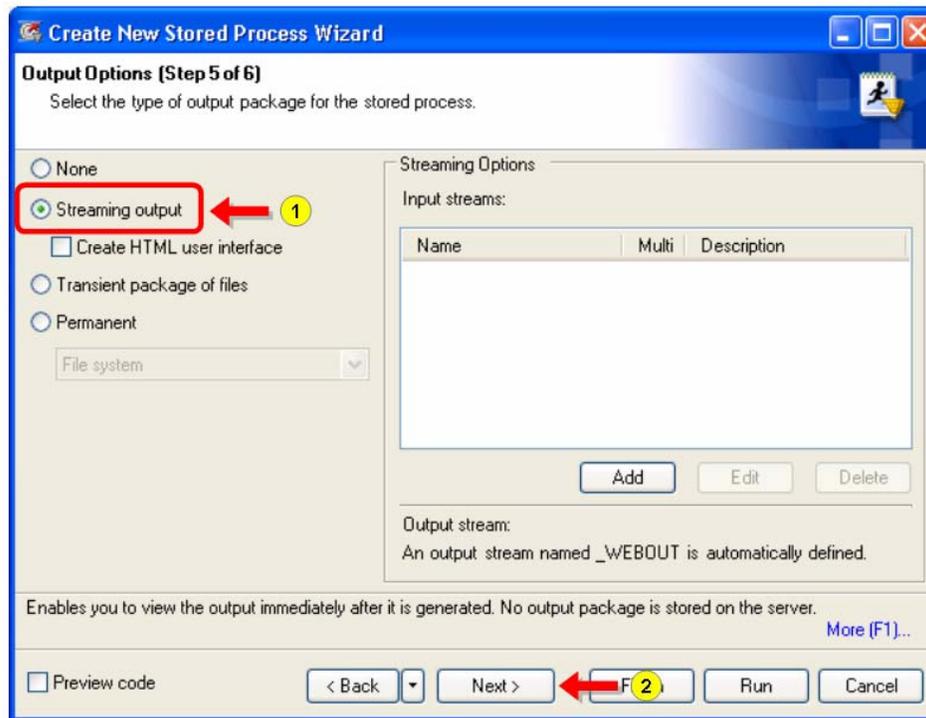
Integer Range

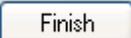
Minimum 1

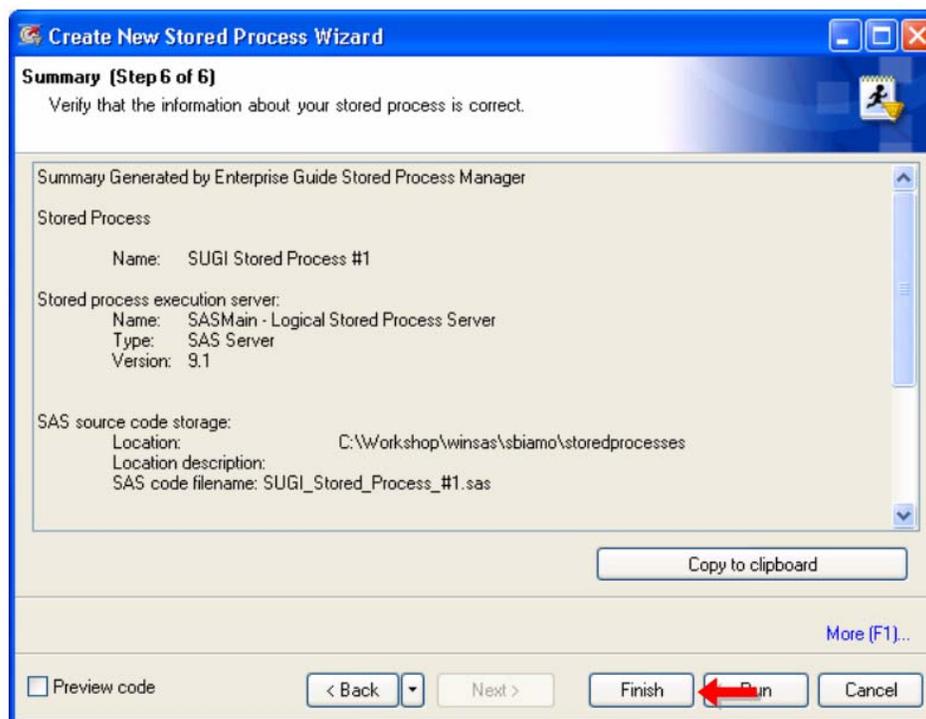
Maximum 10000

Increment 5

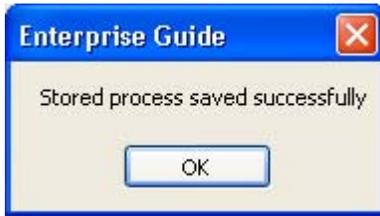
14. Verify that **Streaming output** is selected and click .

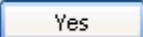


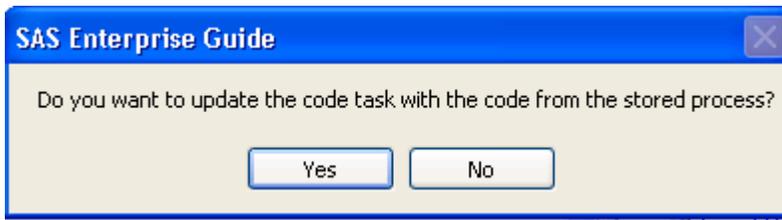
15. Review the summary of the steps and click  to create and register the stored process.



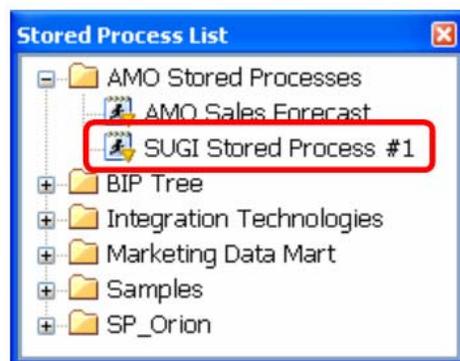
16. When you are notified that the stored process has been saved, click .



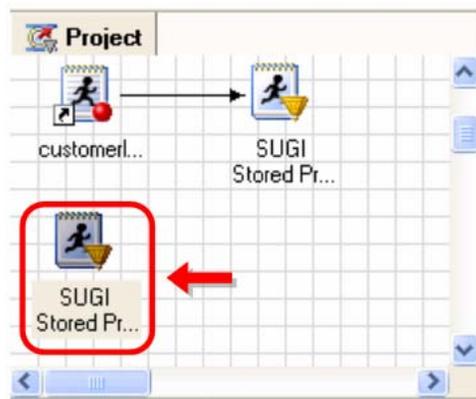
17. When you are prompted to update the code task, click .



18. The Stored Process List should now show the new stored process.

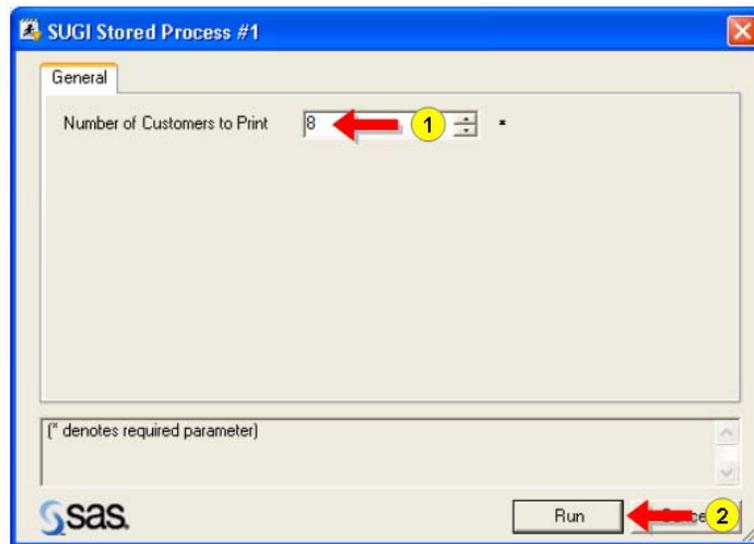


19. Add the new stored process to the project by double-clicking it in the Stored Process List.
20. Run the stored process by selecting **Run This Stored Process** from the pop-up menu (or by selecting the stored process and selecting  on the toolbar).



21. When the parameter window is displayed, change the Number of Customers to Print to 8 and click

Run



22. View the output and verify that only eight customer names and IDs were printed.

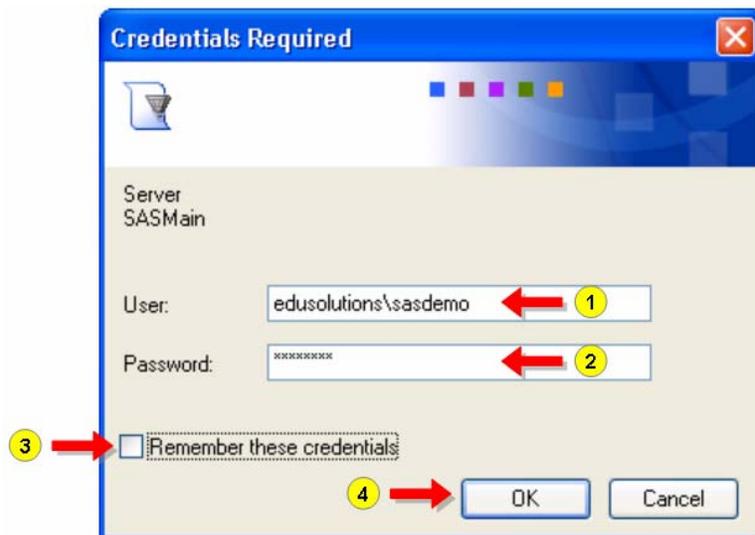
Listing of Orion Gold Customers

Obs	Customer Name	Customer ID
1	Albert Collet	1
2	Markus Sepke	13
3	Oliver S. Fußling	19
4	José Fernández de Mesa	21
5	Dianne Patchin	45
6	Annmarie Leveille	49
7	Gert-Gunter Mendler	50
8	Carsten Maestrini	61

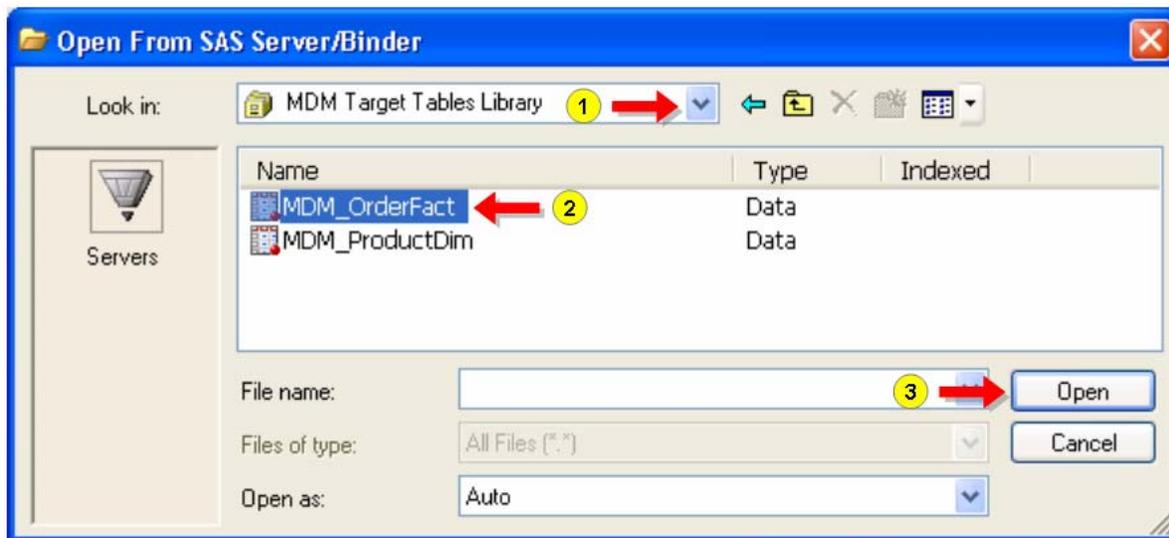
PART 3

Add a data source to the project, run a task against it, and create a new stored process based on that task.

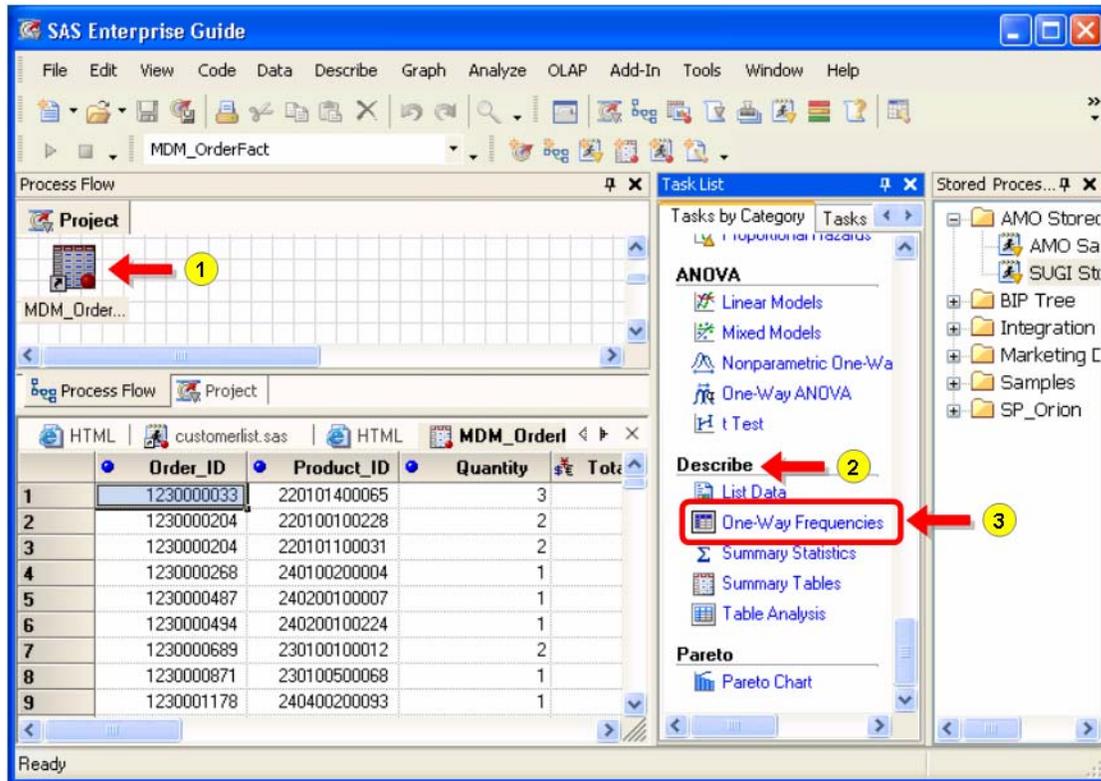
1. Add a data source to the project by selecting **File** ⇒ **Open** ⇒ **From SAS Server/Binder...**. When you are prompted to connect to the SASMain server, type `edusolutions\sasdemo` as the `User`, type `student1` (case sensitive) as the `Password`, clear **Remember these credentials**, and click **OK**.



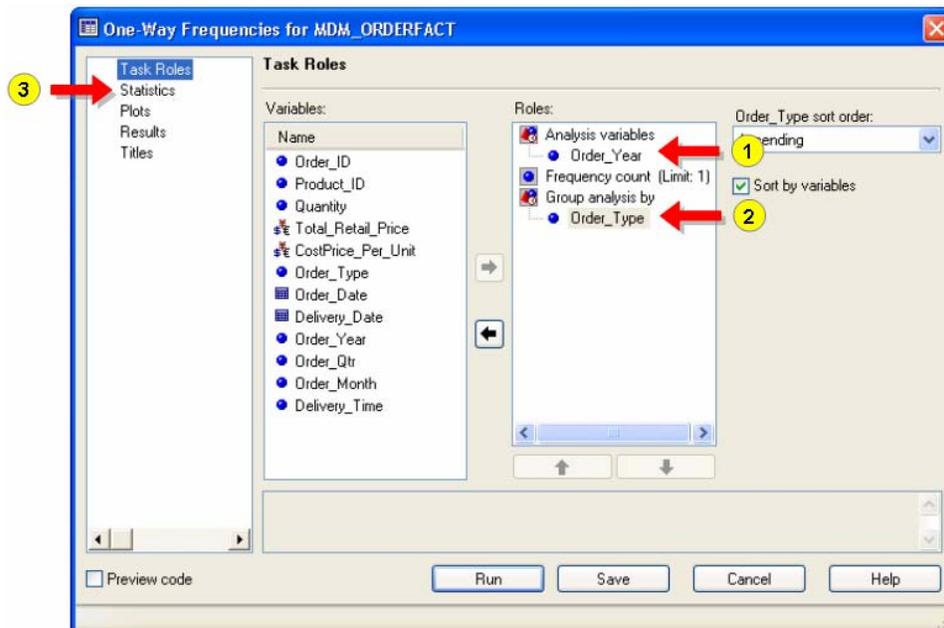
2. Select **MDM Target Tables Library** as the library, select **MDM_OrderFact**, and click **Open**.

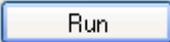


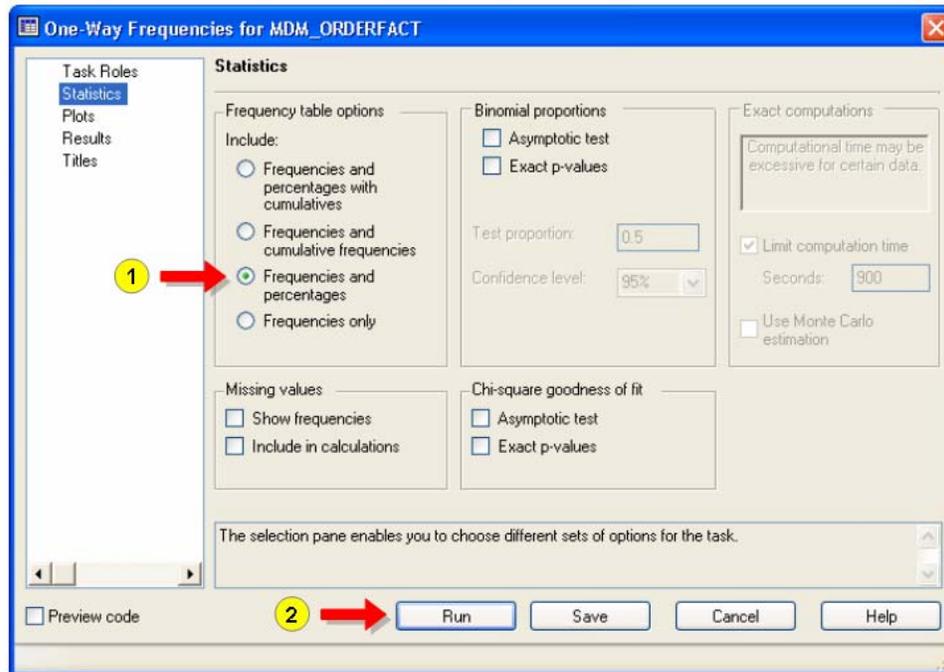
- With the `MDM_OrderFact` table selected, scroll to find the **Describe** section in the Task List and select **One-Way Frequencies**.



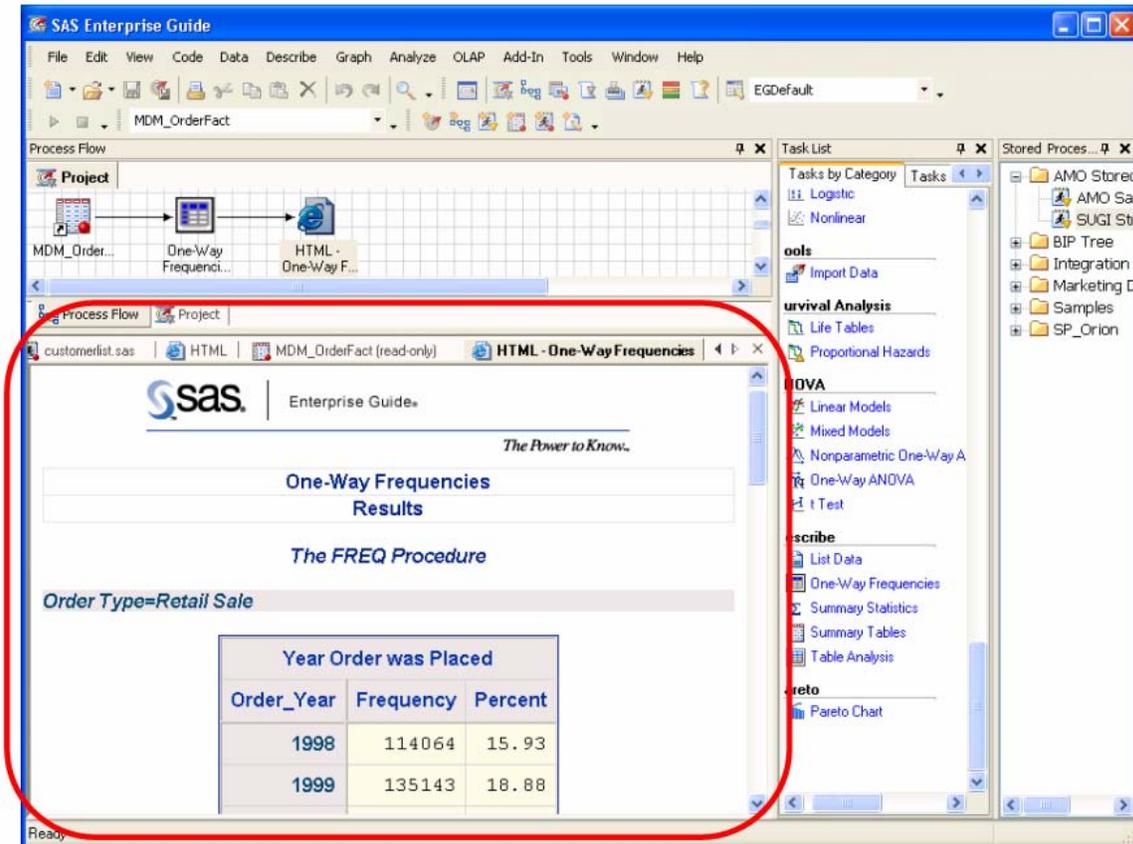
- In the task dialog, drag and drop `Order_Year` onto the Analysis variables role, and drag and drop `Order_Type` onto the Group analysis by role. Select **Statistics** in the navigation pane on the left.



5. Select **Frequencies and percentages** from the Frequency table options and click .



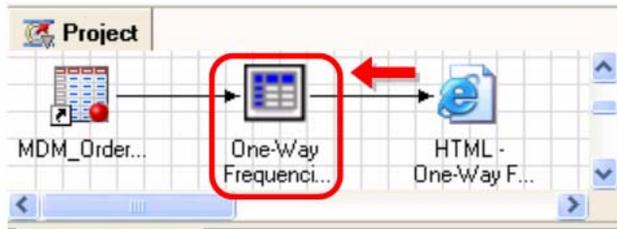
6. View the task output.



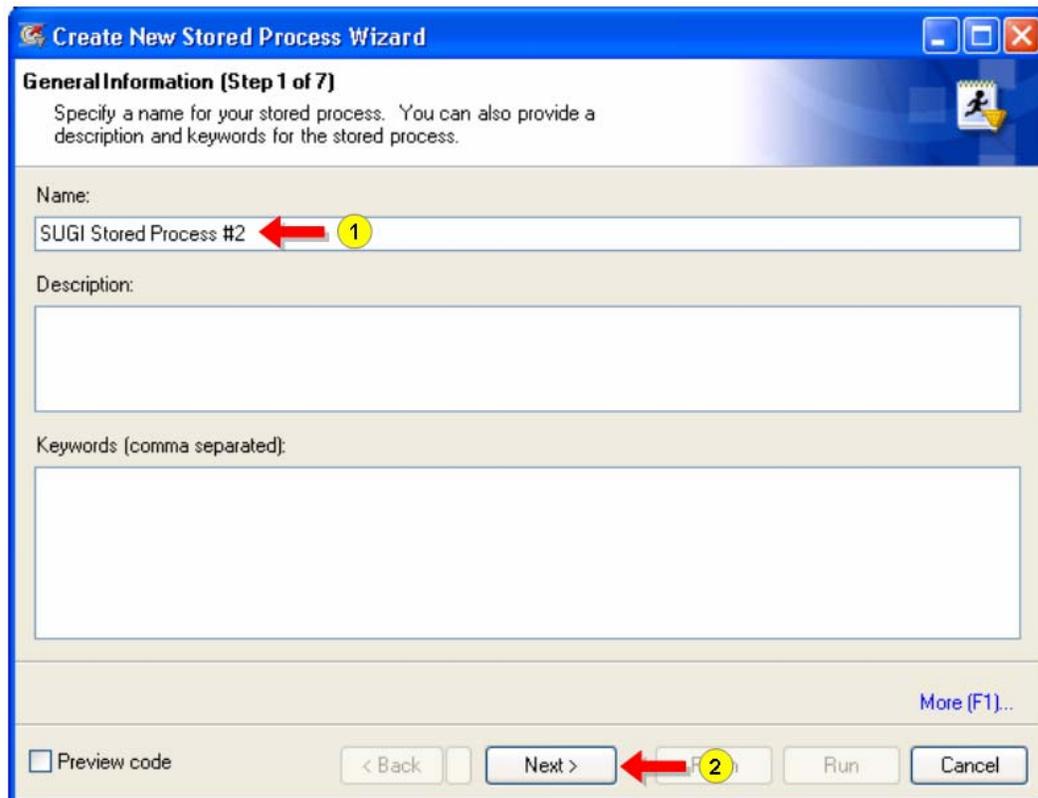
The screenshot shows the SAS Enterprise Guide interface. The main window displays the output of the 'One-Way Frequencies' task. The output is titled 'One-Way Frequencies Results' and includes the text 'The FREQ Procedure' and 'Order Type=Retail Sale'. Below this, a table shows the results for 'Year Order was Placed'.

Year Order was Placed		
Order_Year	Frequency	Percent
1998	114064	15.93
1999	135143	18.88

7. Create a stored process based on the one-way frequencies task. Select the task that you just created, and select **Create Stored Process...** from the pop-up menu.



8. The Create New Stored Process Wizard opens. Type `SUGI stored Process #2` as the Name and click

A screenshot of the 'Create New Stored Process Wizard' dialog box, titled 'Create New Stored Process Wizard'. The window has a blue header and standard Windows window controls. The main area is titled 'General Information (Step 1 of 7)' and contains the following fields:

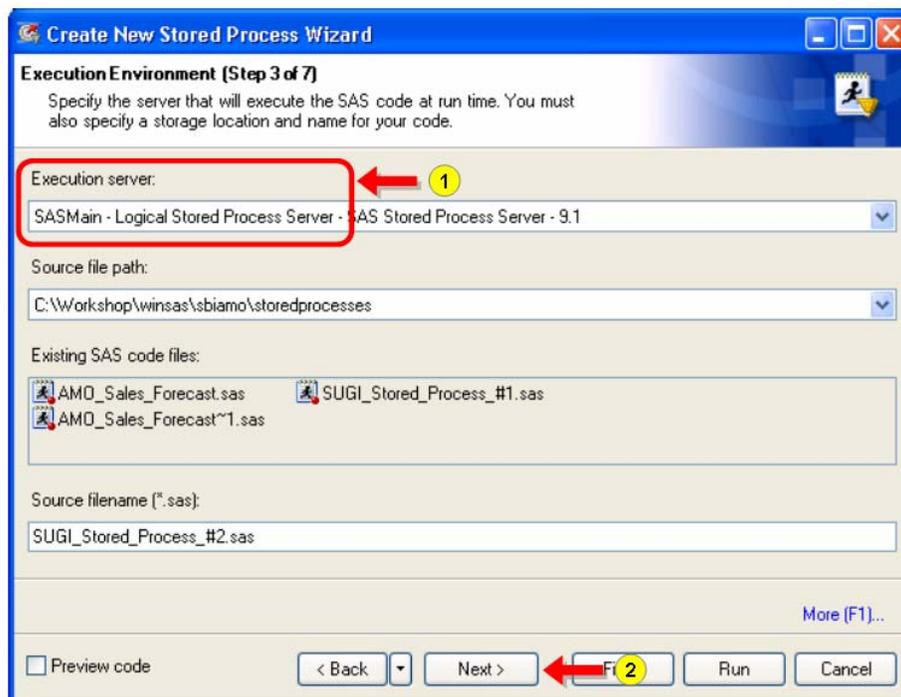
- Name:** A text box containing 'SUGI Stored Process #2'. A red arrow points to this text, and a yellow circle with the number '1' is next to it.
- Description:** An empty text box.
- Keywords (comma separated):** An empty text box.

At the bottom of the dialog, there is a 'More (F1)...' link, a 'Preview code' checkbox (which is unchecked), and a row of buttons: '< Back', 'Next >', 'Run', and 'Cancel'. A red arrow points to the 'Next >' button, and a yellow circle with the number '2' is next to it.

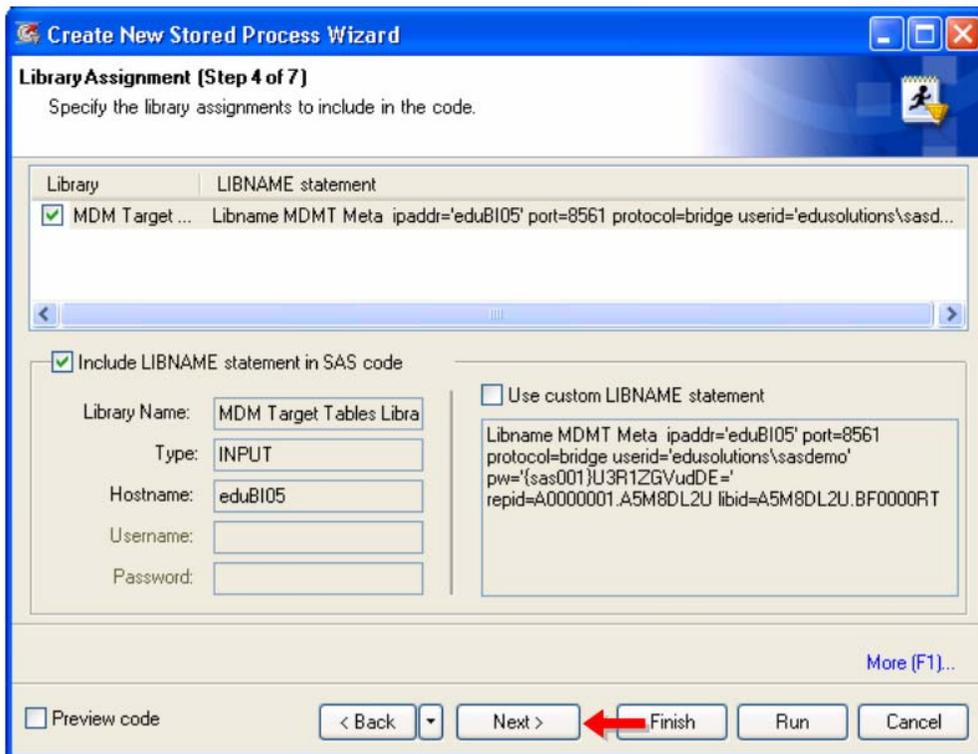
9. In step 2, accept the default location to store the stored process metadata and click .



10. In step 3, verify that the Execution server is set to **SASMain – Logical Stored Process Server**, accept the default Source file path and Source filename, and click .



11. In step 4, accept the default library assignment information and click .



Create New Stored Process Wizard
Library Assignment (Step 4 of 7)
 Specify the library assignments to include in the code.

Library	LIBNAME statement
<input checked="" type="checkbox"/> MDM Target Tables Libra	Libname MDMT Meta ipaddr='eduBI05' port=8561 protocol=bridge userid='edusolutions\sasdemo' pw='(sas001)U3R1ZGVudDE=' repid=A0000001.A5M8DL2U libid=A5M8DL2U.BF0000RT

Include LIBNAME statement in SAS code

Library Name:
 Type:
 Hostname:
 Username:
 Password:

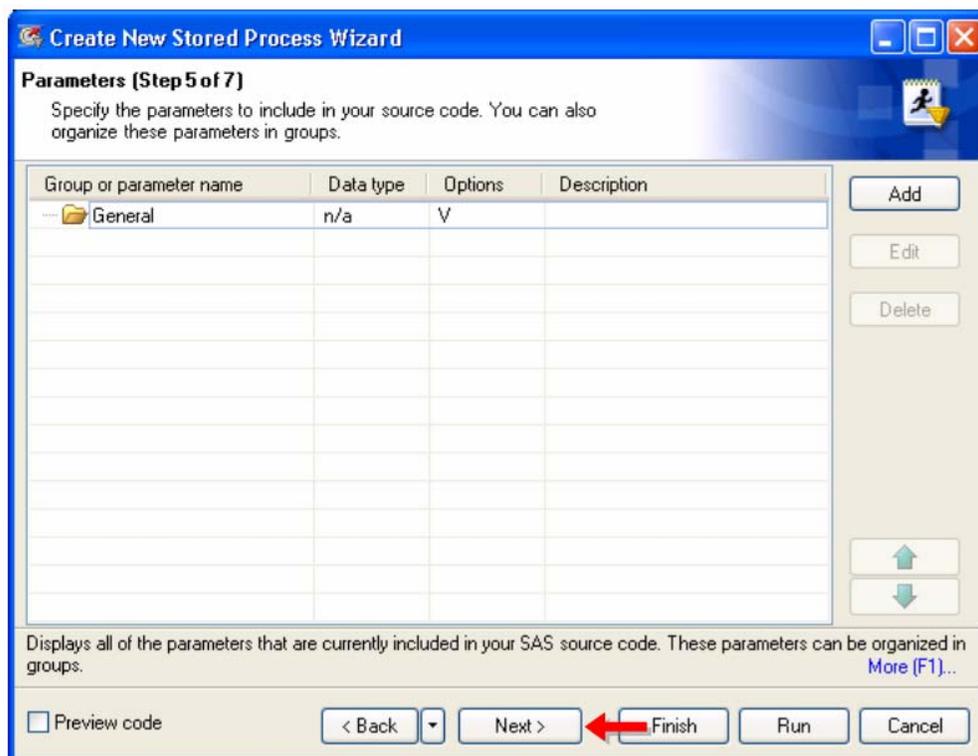
Use custom LIBNAME statement

```
Libname MDMT Meta ipaddr='eduBI05' port=8561
protocol=bridge userid='edusolutions\sasdemo'
pw='(sas001)U3R1ZGVudDE='
repid=A0000001.A5M8DL2U libid=A5M8DL2U.BF0000RT
```

More (F1)...

Preview code < Back **Next >** Finish Run Cancel

12. Because there are no parameters for this stored process, click .



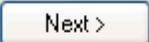
Create New Stored Process Wizard
Parameters (Step 5 of 7)
 Specify the parameters to include in your source code. You can also organize these parameters in groups.

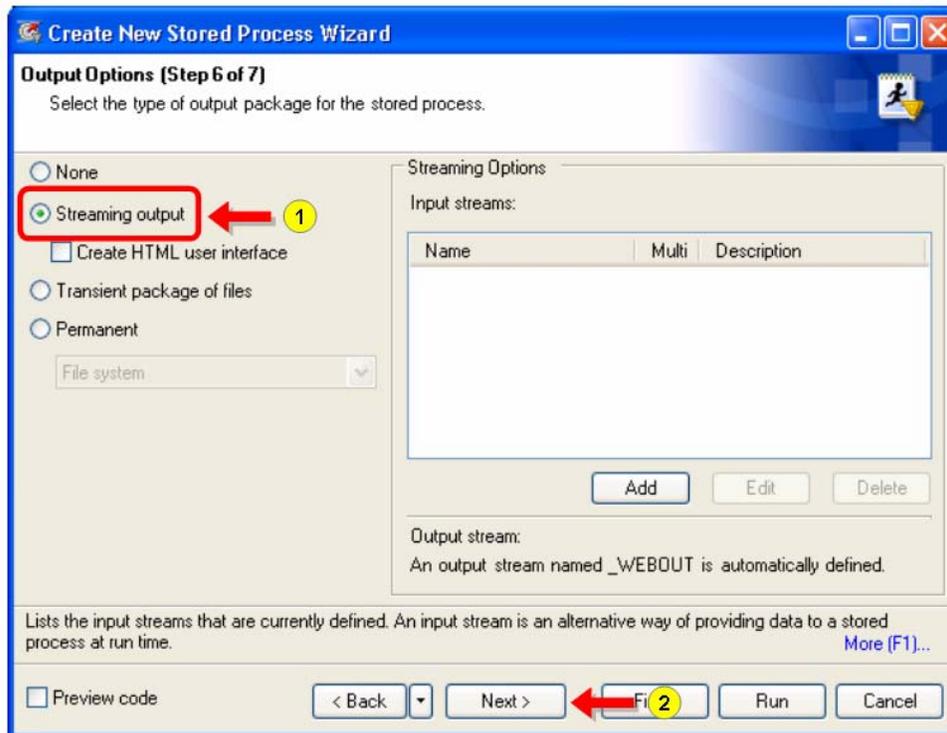
Group or parameter name	Data type	Options	Description
General	n/a	V	

Add
 Edit
 Delete

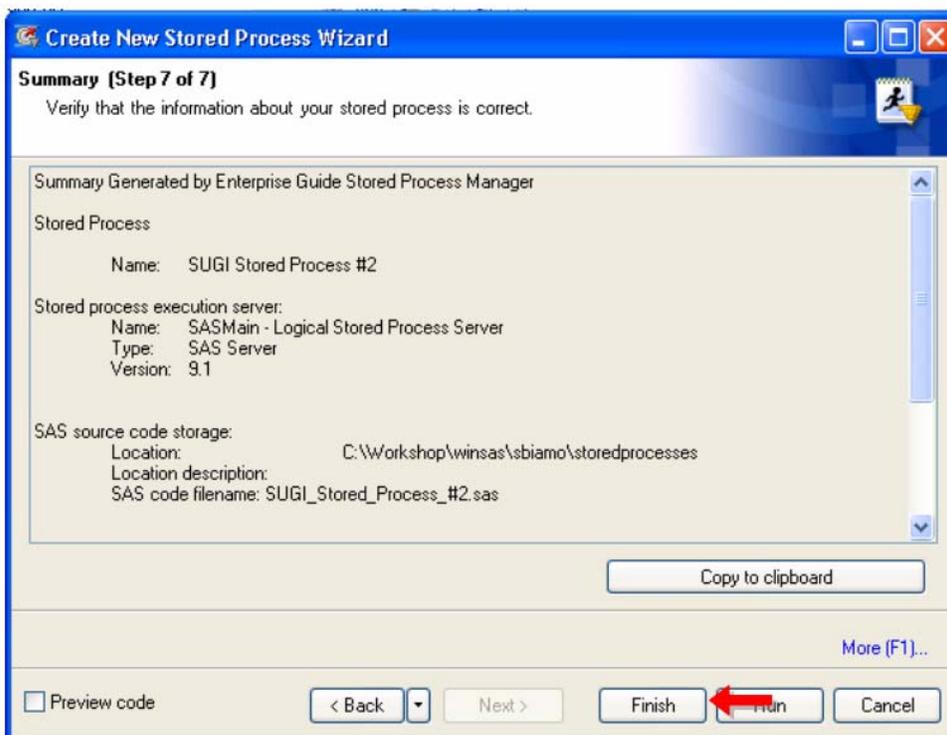
More (F1)...

Preview code < Back **Next >** Finish Run Cancel

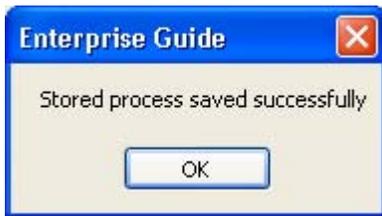
13. Verify that **Streaming output** is selected and click .



14. Review the summary of the steps and click  to create and register the stored process.



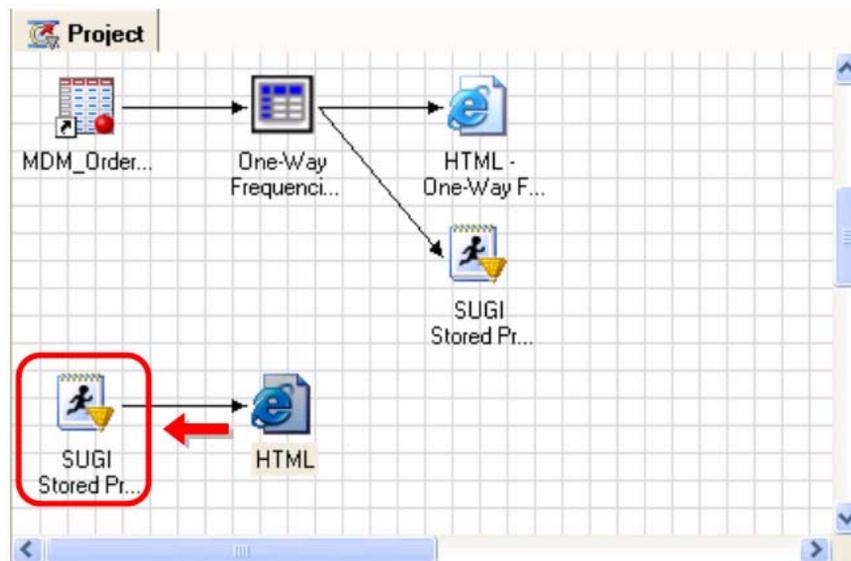
15. When you are notified that the stored process has been saved, click .



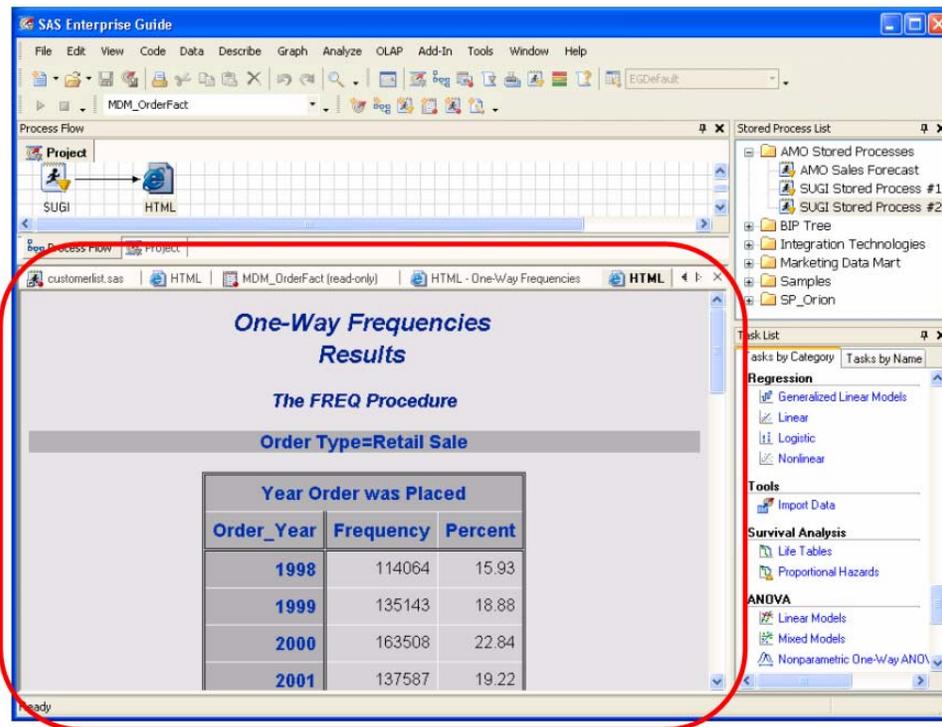
16. The Stored Process List should now include the new stored process.



17. Add the new stored process to the project by double-clicking it in the Stored Process List.
18. Run the stored process by selecting **Run This Stored Process** from the pop-up menu (or by selecting the stored process and selecting  on the toolbar).



19. View the output.



The screenshot shows the SAS Enterprise Guide interface. The main window displays the results of a stored process. The title is "One-Way Frequencies Results" and the procedure is "The FREQ Procedure". The output is for "Order Type=Retail Sale". A table shows the frequency and percent of orders placed in each year from 1998 to 2001.

Year Order was Placed		
Order_Year	Frequency	Percent
1998	114064	15.93
1999	135143	18.88
2000	163508	22.84
2001	137587	19.22

CONCLUSION

This hands-on workshop provided an overview of SAS stored processes and how SAS Enterprise Guide can be used to create and use stored processes.

REFERENCES

You can learn more about SAS stored processes by attending the following SAS Education course: *Creating, Distributing, and Using SAS® Stored Processes*.

CONTACT INFORMATION

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