

Paper 188-2010

## How to Be an Organized SAS® Programmer

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### ABSTRACT

Do you ever forget where that program was that did that great PROC TABULATE or forget what files you sent to a client? This paper shows you how to be a more organized programmer, so you can find things easily. At annual review time, do you forget what projects you've worked on and cannot remember some of your key accomplishments? This paper offers tips on how to refresh your memory and increase your productivity. Your boss will be amazed at how you are able to complete your projects faster and remember which projects you worked on throughout the year.

### INTRODUCTION

This paper shows you tips and techniques for creating more organization in your programming. You can get in the habit of taking notes about what you do, which will serve you in your work. Your boss will be amazed at how you are able to do your projects faster and remember what projects you did throughout the year. I find as I get older, I need help with my memory. Because we can't add RAM to our own memory banks, we need to use some other tricks to help your memory.

### CREATE NOTES

There is a feature in Microsoft Outlook that you can use to create notes for yourself. To create a note in Microsoft Outlook, you click on the Note icon at the bottom left of the screen (see Figure 1b next page). You can create a folder in Outlook under Notes for "Tips" and another for "Accomplishments". These "Notes" look like Post-It Notes (see Figure 1a). When you discover how to do a new programming method or other tip, you can create a "Tip" for it. You can record any accomplishments that you have done, which is useful for review time. You can also create notes for SAS paper ideas and for time spent on projects for timesheet recording.

An example of a "Tip" in a "Tip" Folder is a tip for How to do a SQL query that is similar to the SAS merge "if A". Now, when there is need to do a left join in a SQL query, you can look up this "Tip". If you find you have too many "Tips", you could create an Excel spreadsheet. You could have Tabs for different categories of "Tips" for quick access. For instance, you could have Tips for:

- o General SAS
- o Fancy SAS Tricks
- o Proc Tabulate
- o Proc SQL
- o Unix
- o Miscellaneous

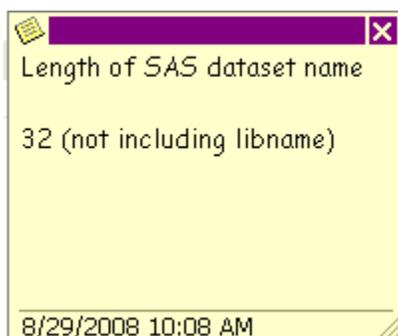


Figure 1a. Sample Post-It Notes

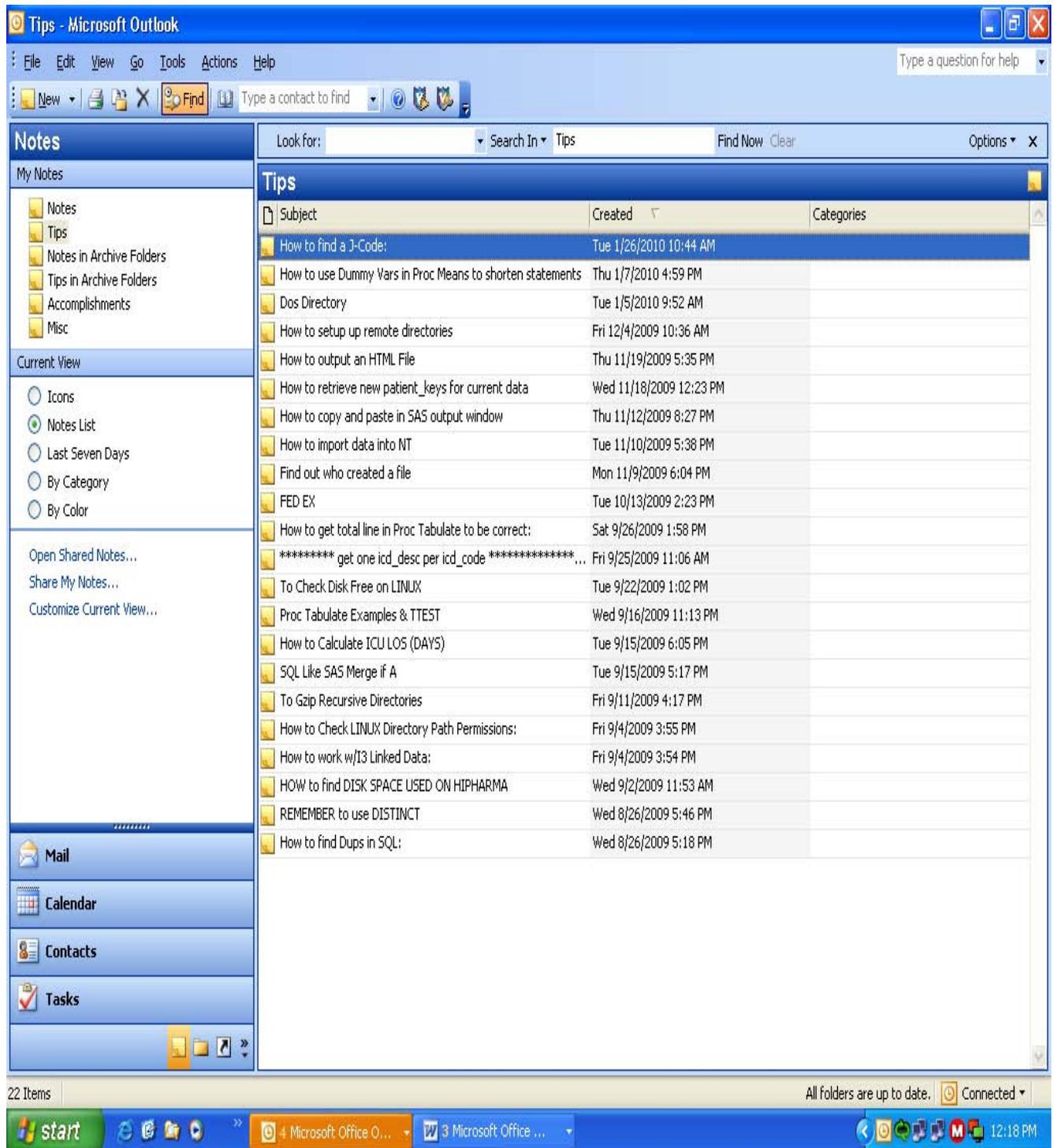


Figure 2b. Screen shot of Microsoft Outlook 2003 Notes

## PROJECT LOGS

You can create a log in Microsoft Excel for all of your projects. Our files at Premier, Inc. are organized by Client and I have a hard time remembering what project I worked on and where the SAS programs are that I need. I created the log to help to jog my memory. You can record the project name, project description, date assigned, the date completed, where the data and program files are located, what I learned, neat things done, etc. This log can help your co-workers find your programs when you are away. You can also create a log for data extracts and files that are sent out to clients. You can have different Tabs in Excel for Quarterly and Adhoc requests, and one for questions from clients. You can keep track of client questions to discover client documentation and training needs.

Project Name	Project Description	Date Assigned	Date Completed	Data Location	Program Location	Procedures Used	What I learned	Neat things that I did
Project X	Rerun Project X Tables, and add Pvalues	01-10-2010	01-29-2010	C:\Project X\Data	C:\Project X\SAS Programs	TABULATE, TTEST	Couldn't get TABULATE to do Pvalues correctly	How to get Pvalues in a dataset
Project Y	Demographic Tables	02-01-2010	02-15-2010	C:\Project Y\Data	C:\Project Y\SAS Programs	SQL, TABULATE	Left outer Join (like SAS merge if A)	Good example for a SAS paper

**Figure 2. Sample Project Log**

## DIRECTORY STRUCTURE

You can use a standard directory structure for your programs, like below. There is an advantage to storing your Program Logs and Listings in another directory. It's easy to overwrite your SAS program when you are saving a Log or Listing if you are naming the Log/Listing the same name as the program. SAS does warn you if you want to replace it, but it is easy to make a mistake. Also, having the Logs and Listings in another directory looks cleaner. Typical uses for the Excel directory is for Excel sheets related to the Project and for ODS Output Files. The Prelim Files directory can be used for Excel spreadsheets that you have edited. Final Deliverables is what is sent to the client.

- Data
- Programs
  - Logs and Listings
- Prelim Files
- Excel
- Final Deliverables

## PROGRAM NAMES

Programs can be split into logical stopping points. For example, if there is one part of your program where you read in your files once into permanent files, then that could be your Import program. This would help avoid importing these files in again and you can save the log from the Import program for useful information. This makes for a cleaner program, where you don't have to comment out what you've already run. You could also split programs by creation of Analytic dataset, by different data types (i.e. Inpatient, Outpatient), and Table output.

You can organize your programs by naming them in run sequence. This will help another co-worker know the order that the programs are run. An example is below.

- 01-Data\_Extract
- 02-Import\_Files\_Into\_SAS
- 03-Clean\_RX
- 04-Demographic\_Table1
- 05-Billing\_Table2

## PROGRAM DOCUMENTATION

It is good practice to put comments at the top of each program with your name, program name, creation date, purpose of the program, dates and reasons for modification. In your programs, it is helpful to document each step of your program with comments about what each step is doing. You can indent any QA steps you do, which will improve the readability of the program.

```
*****
* PREMIER INC
*
* PROGRAM: 02_ Clean_Billing_File
*
* PROGRAMMER: Jean Balent
*
* DATE: Oct 25 2009
*
* This project is for Client XXX for analysis of Cost of Catheters.
* The programs cleans the billing file and removes adjustment records.
*
* Modified:
* JB 10/26/9 Added extra feature to this program.
*
*****;
```

**Figure 3: An Example of a Program Header**

## PROJECT DOCUMENTATION

You can create a text file with general information about the entire project. You could call this 00\_Roadmap or 00\_Project\_Description. An example of this file is:

```
*****
* PREMIER INC
*
* PROGRAM: 00_Project_Description
* PROGRAMMER: Jean Balent
*
* DATE: Oct 25 2006
*
* This project is for Client XXX for analysis of Cost of Catheters.
* The programs are listed below:
*
*****;

* DETAILS ON PROJECT FLOW

* 00_Project_Description - This file.
* 01_Extract_Data.sql - This program extract the data for this project for
Patients
* with Diagnosis of Diabetes.
* 02_Clean_Billing - This program cleans the billing data.

* 03_Demographic_Table1 - This program creates Table 1 Demographic of all patients.
* 04_Billing_Costs_Table2 - This program creates Table 2 Billing Costs.

* 99-Post_processing - Contains information on how to format the Excel spreadsheet
* to meet client's needs.;
```

Figure 4: An Example of Project Documentation

## POST PROCESSING FILE

Another idea is to create a file with information of any manual work that you need to do after the programs have been run. Do you edit the Excel spreadsheets for formatting? If someone else ran your programs, this will help them know what to do. An example of the 99\_Post\_Processing File is below.

```
*****;
* PREMIER INC
*
* PROGRAM: 99_POSTPROCESSING.txt
*
* PROGRAMMER: Jean Balent
*
* DATE: October 25, 2009
*
*****;

DETAILS ON AY POST PROCESSING

1) Save the Excel html file as .xls. This will prevent this document from
opening a webpage.
2) Add Logo to Top Left part of heading.
3) Change background of headings to Black and lettering to white.
4) Add footnote with page number.
```

Figure 5: An Example of a Post Processing File

## CONCLUSION

These are some tips that I have found helpful for my work. My hope is that your career will be even more successful with the use of these tips.

## ACKNOWLEDGMENTS

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## CONTACT INFORMATION

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