Paper 201

A Batch System with Windows® 95

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ABSTRACT

The purpose of the batch system is to automate the use of the SAS® System in a PC environment with the users connected via a LAN. The system has been implemented in the Data Management process, from data review to generation of tables and listings. The system developed is a set of DOS batch files located in the search path of executable files on a network. This provides any user the ability to use the batch files when they log onto their computer. A major requirement is to make the system independent of the user. Additionally, using a batch system allows you to perform multiple tasks while other programs are running. The following is a fairly simple system of batch files that mimic running SAS batch on a mainframe, and help simplify day to day SAS programming.

INTRODUCTION

A DOS batch file is type of executable file. These batch files can be viewed as simple DOS programs that are executed when the filename is typed at the prompt. Information on this can be found in any DOS programming book. Much of the text contained in these batch files is the same text that we type at the DOS prompt. Some advantages of using a batch file are the ability to use environment variables and pass through parameters to the batch file, similar to passing parameters in a SAS macro. Since most of these batch files contain lengthy DOS commands, it is more efficient to create batch files. With the ability to pass through parameters and use environment variables, the batch files become much more powerful by becoming more generic.

BACKGROUND IN DOS

Something we need to be familiar with is the DOS environment variable. One of them is PATH. We are interested in this one because it tells us the search path for executable files. The batch files used throughout reside in a directory that can be found in the PATH variable. Since the batch files also reside on the network, the system can be used by all in Data Management.

To see a list of all defined environment variables, type the word SET at the DOS prompt. You will then see the value of the PATH variable and know where to place the batch files.

We will also be interested in defining, changing, and using a DOS environment variable. Although there is only one we will be using, it is this that is the backbone of the system.

All batch files and SAS programs are created using the DOS editor. Although this may seem a bit out dated, it is a simple editor that 'fits' into our batch system. With the exception of extremely large files, most output files can also be viewed from this editor.

BATCH FILES

The following are DOS batch files used throughout the process of utilizing the SAS System.

BIOSTAT.BAT	OUTPUT.BAT
PGMS.BAT	MACROS.BAT
SETPROJ.BAT	RAW.BAT
SHOWDEF.BAT	SASB.BAT
RUN_SAS.BAT	TRANSFER.BAT
FINAL.BAT	CDM.BAT

The purpose of these files is to automate the process of utilizing the SAS System allowing easy maneuverability throughout a project directory and allowing the user to run SAS in batch or interactive mode.   By typing the name of the batch file at the at the DOS prompt, the file executes performing tasks that would normally require tedious efforts.

REQUIREMENTS

In addition to Windows 95, there are three primary requirements for this system to work. First, the batch files must reside in somewhere in the search path for executable files in DOS.   Second, a standard directory structure and file naming convention must be in place. The backbone to this batch system is the creation of a DOS environment variable that is used throughout the system. This variable contains the value of the project directory.   Shown below is a sample directory structure.
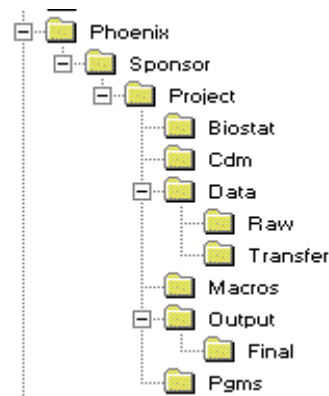
The DOS variable would have the value P:\PHOENIX\SPONSOR\PROJECT.

Lastly, for the standardization of using SAS, a project specific AUTOEXEC file is needed. Here, it resides in the PGMS directory, and is the programmers responsibility to create at the beginning of a project.

FUNCTIONALITY

The system of batch files can be classified into three categories: initial setup, maneuverability, and using SAS. The following is a more detailed description of each.

INITIAL SETUP

Once you enter MSDOS, you would type 'setproj sponsor project'. This would execute the SETPROJ command with two parameters - sponsor and project. This performs multiple tasks. First, it executes DOSKEY from the prompt. The DOSKEY program enables you to recall DOS commands and edit commands at the command line. By using the arrow keys, you can easily recall previous commands. Secondly, it defines an environment variable name PROJPATH with the value of 'P:\PHOENIX\SPONSOR\PROJECT'. Lastly, it changes the directory to the project PGMS directory. Once this command is executed, you can effectively use all other batch files. Be aware that is you simply enter DOS and manually change the directory to the project PGMS directory, the system will not work because the DOS environment variable has not been defined. Likewise, if you change directory to a different project without using the SETPROJ command, the environment variable will still reference the previous project. If this occurs, you can type the command SHOWDEF, which will display a message indicating what sponsor\project the system is referencing. Since easy maneuverability within and between projects is a function of the system, this of little concern.

> SETPROJ SPONSOR PROJECT
- executes DOSKEY
 -sets
PROJPATH=P:\PHOENIX\SPONSOR\PROJECT
 -changes the directory to
P:\PHOENIX\SPONSOR\PROJECT\PGMS
- Displays the message 'Currently under project P:\PHOENIX\SPONSOR\PROJECT'

>SHOWDEF
Displays the message 'Currently under project P:\PHOENIX\SPONSOR\PROJECT'

MANEUVERABILITY

All other files except SASB and RUN_SAS can be used to move from one directory to another within a project. SETPROJ is used to easily move from project to project, and re-defines DOS environment variable. Thus you can move around within a project and between projects in DOS very easily. It is not by coincidence that the name of the batch file is the same name as the location in which you are moving.

>SETPROJ SPONSOR PROJECT
Changes the directory and setup to default to a different project.

>OUTPUT
Changes the directory to
P:\PHOENIX\SPONSOR\PROJECT\OUTPUT
Directory should contain ALL SAS output except for final deliverables to the client.

>FINAL
Changes the directory to
P:\PHOENIX\SPONSOR\PROJECT\OUTPUT\FINAL
Final deliverables to the client.

>RAW
Changes the directory to
P:\PHOENIX\SPONSOR\PROJECT\DATA\RAW
Directory should contain all raw data

>TRANSFER
Changes the directory to
P:\PHOENIX\SPONSOR\PROJECT\DATA\TRANSFER Directory should contain final or intermediate data to be transferred to the client.

>MACROS
Changes the directory to
P:\PHOENIX\SPONSOR\PROJECT\MACROS
Directory has study specific macros.

>PGMS
Changes the directory to
P:\PHOENIX\SPONSOR\PROJECT\PGMS
Directory contains SAS programs used by programmers.

>BIOSTAT
Changes the directory to
P:\PHOENIX\SPONSOR\PROJECT\BIOSTAT
Directory contains programs used by QC and Statistics.

>CDM
Changes the directory to
P:\PHOENIX\SPONSOR\PROJECT\CDM
Contains programs used by Data Management.

UTILIZING SAS

You have the option of running SAS either in Batch(SASB) or interactive mode(RUN_SAS). The PROJPATH DOS variable is used with several SAS System options to customize SAS sessions, which

helps automate the process within the SAS System. The following is a list and brief description of each SAS System option used.

Batch Mode:

config:	Points to the correct configuration file
autoexec:	Points to a file to be executed automatically when initializing the SAS System
nosplash:	Removes the SAS Version screen that appears when initializing SAS
icon:	Immediately minimizes the SAS screen when initializing SAS
sysparm:	Defines a global macro variable used throughout the session
sysin:	The program to be executed in batch mode
log:	Points to the destination of the LOG file produced
print:	Points to the destination of the OUTPUT file produced

Interactive Mode:

config:	Points to the correct configuration file
autoexec:	Points to a file to be executed automatically when initializing the SAS System

AUTOEXEC.SAS FILE

Since this file is of vital importance for simplifying the utilization of SAS, it deserves more attention. The function of an autoexec file is fairly simple. Basically, this file is a SAS program that is automatically executed when the SAS system is initialized using the autoexec system option. Many project specifics such as the search path of the macro library, the search path for formats catalogs, data libraries, and definitions of global macro variables used throughout the macro library are defined within this file.

>RUN_SAS
Executes SAS in an interactive mode using the project AUTOEXEC file

>SASB program_name
Runs the specified program in batch mode. You should NOT type the .SAS extension. The resulting LOG and OUTPUT(LST) file will reside in the OUTPUT directory.

BEHIND THE SCENES WITH BATCH

An alternative approach to using the batch files is manually typing everything at the DOS prompt. However, this proves to be highly inefficient. The following examples serve two purposes, to show the efficiency of using batch files and give you an idea of what actually happens when a batch file is executed.

Using the SETPROJ command would be the same as executing the following commands from the DOS prompt:

>DOSKEY
>SET
PROJPATH=P:\PHOENIX\SPONSOR\PROJECT
>CD %PROJPATH%\PGMS

In order to run a program in batch mode (for example, L701DEMO.SAS in the PGMS directory), the SASB command actually executes the following:

>I:\SAS612\SAS.EXE –CONFIG
I:\SAS612\CONFIG.SAS –AUTOEXEC
%PROJPATH%\PGMS\AUTOEXEC.SAS   -
NOSPLASH –ICON –SYSPARM L701DEMO   -
SYSIN L701DEMO.SAS   -
LOG %PROJPATH%\OUTPUT\L701DEMO.LOG -
PRINT %PROJPATH%\OUTPUT\L701DEMO.LST

Clearly, it is much easier to type   SASB L701DEMO at the prompt.

Lastly, to move to the OUTPUT directory to view the LOG and LST files, the following is identical to using the OUTPUT command:

>CD %PROJPATH%\OUTPUT

As you can see, the DOS environment variable is extremely useful, and the system is dependent on it. Using the batch commands allows us to work far more efficiently.

SAS BATCH/INTERACTIVE

Although the system was designed with the intention of running SAS batch, you have the ability to run either in batch mode or in interactive(windowing) mode. Interactive is useful for development purposes, but running batch has considerable advantages in both accuracy and efficiency. Listed are a few of the more beneficial.

- All output and logs are automatically saved in the output directory without the use of proc printto.
- Multiple programs can be run simultaneously.
- Each program is run without anything lingering in SAS's memory.
- Other work related tasks can be performed when long jobs are executing.
- A file must be saved when exiting the DOS editor in order to run it. How many times have we not saved a program or accidentally overwritten a different program.

CONCLUSION

The above system can be modified (to a limited degree due to DOS programming) to suit your needs and possibly the needs of an entire department, if the operation system is Windows 95. I have found this extremely useful in putting together a standard process of utilizing SAS with limited resources.

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TRADEMARK INFORMATION

SAS is a registered trademark of SAS Institute Inc., Cary, NC, USA.

Windows 95 is a registered trademark of Microsoft Corporation.

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