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Ronald Fehd,
Centers for Disease Control, and Prevention, Atlanta GA USA

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ABSTRACT

This paper presents an overview of issues of usage of PC-SAS® in a project directory. Topics covered include directory structure, how to start SAS in a particular (project) directory, SAS command line invocation, location and modification of SAS configuration files, creation and usage of a project autoexec.sas, and directing output in various formats, — e.g.: html, rtf, or xls — to appropriate directories. Example programs are executed with Windows batch files so that each program's log and list can be examined separately. Issues of program reuse, i.e., either as macros or include files, are addressed in the discussion of an autoexec.

This is not an introduction to SAS programming course but it is *about* how to manage SAS programming.

Expected audience is all users of PC-SAS, especially anyone using SAS for more than one project.

Keywords: PC-SAS Windows.

Contents

INTRODUCTION

When SAS is installed, the user will have at least a Windows Program item or, at best, a SAS icon on the desktop. Executing SAS using either of these methods yields an interactive session where Alt-File-Open defaults to a directory which Windows specifies and SAS adds yet another couple of subdirectories underneath. The purpose of this paper is to provide the necessary knowledge to change the File-Open and File-Save-As directory to a particular project directory, which can be either on the user's desktop or on a Local Area Network (LAN).

SETUP FOR CLASS OR SELF-STUDY

The examples used in this paper are available on the CDC Statistical Software Server:

CDC Stat Software Server

```
1 + My Network Places
2   + Entire Network
3     + MicroSoft Windows Network
4       + Cdc
5         + Acdc-Atl-icisi
6           + intra-stat
7 \\acdc-atl-icisi\intra-stat\classNotes\setupPC-SAS
```

Highlight this directory, Alt-C: copy, go to C:/temp and Alt-V: paste. This will copy all files to your local disk.

PROJECT A: HOW TO CHANGE ALT-FILE-OPEN

Purpose: to demonstrate how to start SAS so that Alt-File-Open looks in a particular (project) directory.

The task list for Project A is in `aaReadMeA.txt`. This file can be opened with NotePad by double-clicking on `aaReadMeA.bat`.

./ProjectA/aaReadMeA.bat

```
rem     aaReadMeA.bat
NotePad aaReadMeA.txt
exit
```

./ProjectA/aaReadMeA.txt

```
aaReadMeA.txt:   Task List for Project A

task: start SAS session one:
      SAS.bat
      Q: Alt-File-Open to which directory?
      A: v8.2: V8    with folder classdoc
         v9.1: 9.1   with folder classdoc
      end SAS session

task: start SAS session two:
      SASinitFolder.bat
      Q: Alt-File-Open to which directory?
      A: projectA
         i.e. C:\temp\setupPC-SAS\projectA
      end SAS session

task: create SASv?.cfg
      uNotePadSAScfg.bat   end NotePad: Alt-File-eXit
                                        for SASv8.cfg
                                        for SASv9.cfg

task: start SAS session three:
      SAS.bat
      Q: Alt-File-Open to which directory?
      A: C:\temp\setupPC-SAS\projectA

task: execute example programs, review log and list
      either in session
          or by closing SAS session
             and  using uExecSASprojectA.bat
      Prg1MakeFormat
      Prg2ReadText
      Prg3ProcFreq
      Q: how many file-types in your directory?
      A: *.bat    *.sas
         *.cfg    *.sas7bcat formats
         *.log    *.sas7bdat data set
         *.lst    *.txt
      Q: what do SAS programs have in common?
      A: each has libname, title, options

      use batch files:
task: execute all programs, view program, log, and list
      uExecSASprojectA.bat

task: at end of class run:
      uZdelProjectA
```

ProjectA: before

```
aaReadMeA.bat
aaReadMeA.txt
Prg1MakeFormat.bat
Prg1MakeFormat.sas
Prg2ReadText.bat
Prg2ReadText.sas
Prg3ProcFreq.bat
Prg3ProcFreq.sas
SAS.bat
SASinitFolder.bat
uExecSASprojectA.bat
uNotePadSAScfg.bat
uZdelProjectA.bat
xSASv8.cfg
xSASv9.cfg
```

TASK: START SAS SESSION

A SAS session can be started by double-clicking on `SAS.bat`. Note that this will run either of v8 or v9.1, whichever is installed (using the standard installation) on your desktop. If you have both, then v9 will start after you close v8.

./ProjectA/SAS.bat

```
rem name: SAS.bat

rem SASv8
"C:\Program Files\SAS Institute\SAS\V8\sas"
rem -CONFIG "C:\Program Files\SAS Institute\SAS\V8\SASV8.CFG"
rem File-Open: C:\Documents and Settings\rjf2.PHPPO\My Documents\My SAS Files\V8

rem SASv9
"C:\Program Files\SAS\SAS 9.1\SAS"
rem -CONFIG "C:\Program Files\SAS\SAS 9.1\nls\en\SASV9.CFG"
rem File-Open: C:\Documents and Settings\rjf2.PHPPO\My Documents\My SAS Files\9.1
```

Q: Alt-File-Open to which directory? The `SAS.bat` file (above) contains the approximate answers to these questions depending on your version.

your File-Open path will differ at the elipsis:

```
rem File-Open: C:\Documents and Settings\ ... \My Documents\My SAS Files\9.1
```

What needs to be done different to have SAS look in your project folder?

Close this SAS session and let's look at another `.bat` file.

TASK: START SAS, ROUND TWO:

This time use `SASinitFolder.bat`. Again note that both versions are present.

./ProjectA/SASinitFolder.bat

```
rem name: SASinitFolder.bat

"C:\Program Files\SAS Institute\SAS\V8\sas" -SASinitialFolder 'C:\temp\setupPC-SAS\projectA'
"C:\Program Files\SAS\SAS 9.1\SAS"          -SASinitialFolder 'C:\temp\setupPC-SAS\projectA'

rem Alt-File-Open: C:\temp\setupPC-SAS\projectA
```

By adding the option `SASinitialFolder` with the current folder as the value to the command-line, (start-up or invocation) SAS will now look in the current folder, when you use Alt-File-Open. Note: case is irrelevant for options: `sasinitialfolder` will work.

Do we want to have this 22-character option and value in every batch file that we use to run a SAS program? No. There is a way to add that option to every SAS session started in a project folder.

TASK: CREATE SASV?.CFG:
See `uNotePadSAScfg.bat` which creates a configuration file for this project.
This batch file copies the example file, and opens it; as you close each of the files, the next one will be opened. The process is designed to create the files; you are not expected to make any changes.

./ProjectA/uNotePadSAScfg.bat

```
rem        name: uNotePadAutoAndCfg.bat
rem description: copy xSASv?.cfg to SASv?.cfg
rem              open with NotePad
rem     purpose: create SASv?.cfg
rem        note: exit NotePad: Alt-File-eXit

rem    +R set Read-Only
rem    -R set Read-Write
rem    /Y no  prompt for overwrite

attrib +R xSASv8.cfg
copy   /Y xSASv8.cfg SASv8.cfg
attrib -R  SASv8.cfg
NotePad    SASv8.cfg

attrib +R xSASv9.cfg
copy   /Y xSASv9.cfg SASv9.cfg
attrib -R  SASv9.cfg
NotePad    SASv9.cfg
```

TASK: START SAS, ROUND THREE:

Use `SAS.bat` to start SAS again.

Task Q: Alt-File-Open to which directory? Third time is a charm!

With Alt-File-Open you now see `ProjectA`.

TASK: EXECUTE SAS PROGRAMS:

Prg1MakeFormat: See the `.bat` and `.sas`.

Each of the three SAS programs provided has a batch file provided to run it. You may also execute the program from the last SAS session which you started, after creating the SASv?.cfg so that the programs are available via Alt-File-Open.

./ProjectA/Prg1MakeFormat.bat

```
rem Prg1MakeFormat.bat
"C:\Program Files\SAS Institute\SAS\V8\sas" -sysin Prg1MakeFormat
"C:\Program Files\SAS\SAS 9.1\SAS"          -sysin Prg1MakeFormat
```

./ProjectA/Prg1MakeFormat.sas

```
*name:  Prg1MakeFormat.sas;
libname Library 'C:\temp\setupPC-SAS\projectA';
title1          'C:\temp\setupPC-SAS\projectA';
options nocenter;

PROC Format  library = Library ;

value $test    'a'   =  1
               'b'   =  2;

value  boolean  0    = 'false'
                1    = 'true'
               other = 'missing';

*print list of (in)formats;
PROC Format  library = Library fmtlib;
     title2 'library = Library';

run;
```

Prg2ReadText:

./ProjectA/Prg2ReadText.sas

```
*name:  Prg2ReadText.sas;
libname Library 'C:\temp\setupPC-SAS\projectA';
title1          'C:\temp\setupPC-SAS\projectA';
options nocenter;

DATA   Library.Prg2ReadText;
attrib Id  length = 4 %*integer;
       Var length = 4 format = boolean. ;
infile cards;
input  @1 ID
       @2 var
;cards;
0 0
1 1
2 1
3 2
4 3
;
Proc Print   data = Library.Prg2ReadText;
     title2 'data = Library.Prg2ReadText';
run;
```

Prg3ProcFreq:

./ProjectA/Prg3ProcFreq.sas

```
*name: Prg3ProcFreq.sas;
libname Library 'C:\temp\setupPC-SAS\projectA';
title1          'C:\temp\setupPC-SAS\projectA';
options nocenter;

PROC Freq    data   = Library.Prg2ReadText ;
     title2 'data   = Library.Prg2ReadText';
             tables   Var
                    / list missing
                out = Library.Prg3ProcFreqVar ;

PROC Print   data   = Library.Prg3ProcFreqVar ;
     title2 'data   = Library.Prg3ProcFreqVar';

run;
```

Q: How many file-types? The result of running each of the batch files is the creation of a log and list for each program. In addition there are format catalogs and permanent data sets.

./ProjectA/aaReadMeA.txt

```
      A: *.bat    *.sas
         *.cfg    *.sas7bcat formats
         *.log    *.sas7bdat data set
         *.lst    *.txt
      Q: what do SAS programs have in common?
```

ProjectA: after-1

```
aaReadMeA.bat
aaReadMeA.txt
formats.sas7bcat
Prg1MakeFormat.bat
Prg1MakeFormat.log
Prg1MakeFormat.lst
Prg1MakeFormat.sas
Prg2ReadText.bat
Prg2ReadText.log
Prg2ReadText.lst
Prg2ReadText.sas
prg2readtext.sas7bdat
Prg3ProcFreq.bat
```

ProjectA: after-2

```
Prg3ProcFreq.log
Prg3ProcFreq.lst
Prg3ProcFreq.sas
prg3procfreqvar.sas7bdat
SAS.bat
SASinitFolder.bat
SASv8.cfg
SASv9.cfg
uExecSASprojectA.bat
uNotePadSAScfg.bat
uZdelProjectA.bat
xSASv8.cfg
xSASv9.cfg
```

Q: What do programs have in common?
Each program has the same set of libname, title1 and options.
In Project B we will examine the use of an `autoexec.sas`, which works similar to the configuration file: it executes common SAS statements at the beginning of every program.

./ProjectA/Prg1MakeFormat.sas

```
1  *name:  Prg1MakeFormat.sas;
2  libname Library 'C:\temp\setupPC-SAS\projectA';
3  title1          'C:\temp\setupPC-SAS\projectA';
4  options nocenter;
```

./ProjectA/Prg2ReadText.sas

```
1  *name:  Prg2ReadText.sas;
2  libname Library 'C:\temp\setupPC-SAS\projectA';
3  title1          'C:\temp\setupPC-SAS\projectA';
4  options nocenter;
```

./ProjectA/Prg3ProcFreq.sas

```
1  *name: Prg3ProcFreq.sas;
2  libname Library 'C:\temp\setupPC-SAS\projectA';
3  title1          'C:\temp\setupPC-SAS\projectA';
4  options nocenter;
```

NOTES ON OPTIONS

SASinitialFolder This option provides the name of the directory where SAS looks for programs to execute.

OptionSASinitialFolder.log

```
25 1          *name: OptionSASinitialFolder.sas;
26 2          Proc Options define value option = SASinitialFolder;
27 3                       title2      'option = SASinitialFolder';
28 4
29 5          *Proc Options group = EnvFiles;
30 6
31
32     SAS (r) Proprietary Software Release 9.1  TS1M3
33
34 Option Value Information For SAS Option SASINITIALFOLDER
35     Option Value: .
36     Option Scope: SAS Session
37     How option value set:  Config File(s)
38 Option Definition Information for SAS Option SASINITIALFOLDER
39     Group= ENVFILES
40     Group Description: SAS library and file location information
41     Description: Sets SAS's initial working folder. Also changes initial folder
42                  of Open and Save As dialog to be current working folder.
43     Type: The option value is of type CHARACTER
44           Maximum Number of Characters: 260
45           Casing: The option value is retained with original casing.
46           Quotes: If present during "set", start and end quotes are removed
47           Parentheses: The option value does not require enclosure within
48           parentheses. If present, the parentheses are retained.
49           Expansion: Environment variables are shown in expanded form.
50     When Can Set: Session startup (command line or config) only
51     Restricted: Your Site Administrator can restrict modification of this
```

SysIn This option provides the name of the SAS program to execute. The default extension is `.sas`.

OptionSysIn.log

```
25 1          *name: OptionSysIn.sas;
26 2          Proc Options define value option = Sysin;
27 3                       title2      'option = Sysin';
28 4          *Proc Options group = EnvFiles;
29
30     SAS (r) Proprietary Software Release 9.1  TS1M3
31
```

```
Option Value Information For SAS Option SYSIN
    Option Value: C:\temp\setupPC-SAS\OptionSysIn.sas
    Option Scope: Program OptionSysIn
    How option value set:  SAS Session Startup Command Line
Option Definition Information for SAS Option SYSIN
    Group= ENVFILES
    Group Description: SAS library and file location information
    Description: Specifies the default location of SAS source code when running
                 in batch or noninteractive mode
    Type: The option value is of type CHARACTER
          Maximum Number of Characters: 1024
          Casing: The option value is retained with original casing.
          Quotes: If present during "set", start and end quotes are removed
          Parentheses: The option value does not require enclosure within
          parentheses. If present, the parentheses are retained.
          Expansion: Environment variables are not shown in expanded form.
    When Can Set: Environment Startup (details unknown) or Session Startup only
    Restricted: Your Site Administrator cannot restrict modification of this
option.
    Optsave: Proc Optsave or command Dmoptsave will not save this option.
```

Group eq EnvFiles Both `SASinitialFolder` and `SysIn` are in the options group `EnvFiles`.

OptionGroupEnvFiles.lst

```
Group= ENVFILES
Group Description: SAS library and file location information
note: OptDescription is truncated

OptName             OptDesc

APPLETLOC           Location of Java applets
FMTSEARCH           List of catalogs to search for formats and informats
NEWS                Location of NEWS file that contains messages to be written to the SAS lo
PARM                Parameter string to pass to external program
PARMCARDS           Fileref for the PARMCARDS file
RSASUSER            Open SASUSER library as READONLY
SAMPLOC
SASHELP             Location of the SASHELP library
SASUSER             Location of SAS data library containing user profile catalog
SYSPARM             Character string that can be passed to SAS programs
TRAINLOC            Location of SAS online training courses
USER                Default location for all one-level SAS data set names
UUIDCOUNT           UUID Generator Server Cache
UUIDGENDHOST        UUID Generator Server
WORK                Location for WORK SAS data library
WORKINIT            Erase all files from WORK library at SAS invocation
WORKTERM            Erase all files from WORK library at SAS termination
RTRACELOC           Specifies the pathname of the file to which RTRACE information is writte
SASINITIALFOLDER    Sets SAS's initial working folder. Also changes initial folder of Open a
SET                 Defines an environment variable
ALTLOG              Specifies the destination for a copy of the SAS log
ALTPRINT            Specifies the destination for a copy of the SAS procedure output file
AUTOEXEC            Specifies the autoexec file to be used
LOG                 Specifies a destination to which the SAS log is written in batch or noni
MSG                 The path to the sasmsg directory
PRINT               Specifies the destination for SAS output in batch or noninteractive mode
SASHOST             >>Option Description Needed<<
SYSIN               Specifies the default location of SAS source code when running in batch
```

PROJECT B: USE OF AN AUTOEXEC

PROJECT C: MACRO USAGE