

FILE MANAGEMENT USING PIPES AND 'X' COMMANDS IN SAS®

BASUG Quarterly Meeting

Emily K.Q. Sisson

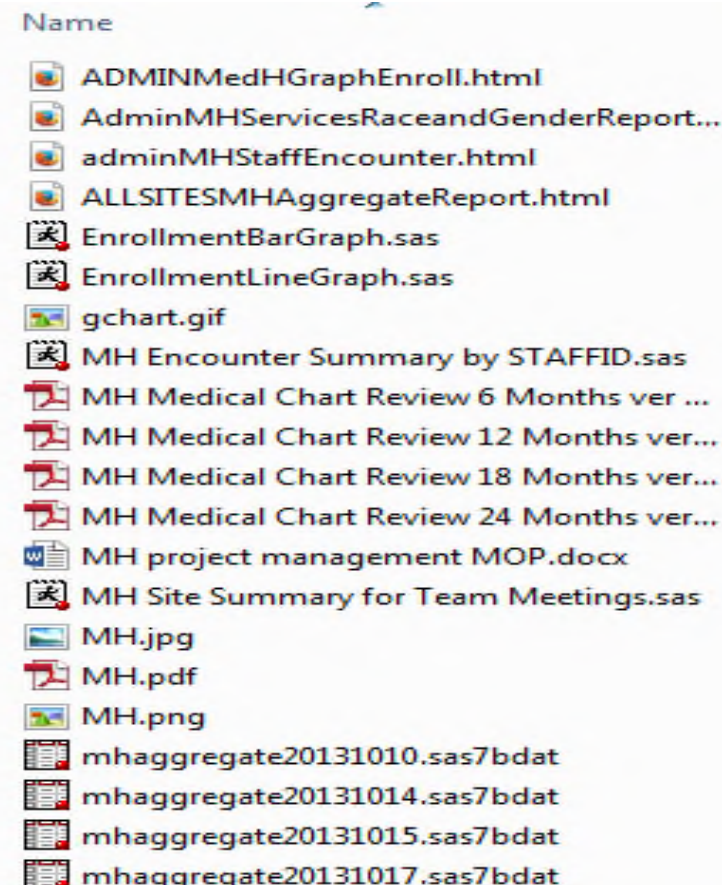
December 3, 2015

Introduction

- We all know that SAS is a powerful analytic tool
- SAS also can be a great file management tool through the use of
 - Pipes
 - Operating System Commands ('x' commands)
 - Data manipulation
 - Call Execute Statements

Introduction

- Example problem: Hundreds of files of varying type in a single folder. As the project continues, it becomes increasingly difficult to locate documents
- For example, let's move these files into subdirectories within the current folder:
 - File Type (.html, .sas, etc)
 - Date (YYYYMM)



Introduction

- Generate a listing of files (pipe device)
- Utilize listing to manage and organize (data manipulation)
- Create new directories through SAS to archive your files (operating system ('x') commands; call execute)
- Move original files to new destinations (operating system ('x') commands; call execute)

Step 1: Generate a Database of Files

```
filename dirlist pipe 'dir "Y:\MyFiles" /s';  
  
data dirlist ;  
    length lineinfo $256 ;  
    infile dirlist length=reclen ;  
    input lineinfo $varying256. reclen ;  
  
run;
```

Step 1: Generate a Database of Files

- Excerpt from DIRLIST dataset

	lineinfo
1	Volume in drive Y is Y03 - Y Drive (SPH)
2	Volume Serial Number is E65B-E2D5
3	
4	Directory of Y:\MyFiles
5	
6	09/28/2015 11:07 AM <DIR> .
7	09/28/2015 11:07 AM <DIR> ..
8	04/08/2014 10:33 AM 20,560 ADMINMedHGraphEnroll.html
9	03/20/2014 09:19 AM 67,438 AdminMHServicesRaceandGenderReport.html
10	09/28/2015 08:21 AM 799,745 adminMHStaffEncounter.html
11	09/28/2015 08:17 AM 197,282 ALLSITESMHAgregateReport.html
12	07/24/2015 08:58 AM 31,728 EnrollmentBarGraph.sas

Step 2: Utilize Listing to Manage and Organize

- Decide what it is, exactly, you want to do with your files
- Organize and archive by year? month? quarter?
- Delete large files?
- Develop new variables to help you organize the file list:
 - NEWDATE: *YYYYMM* of the file date
 - FILESIZE: Extract substring of file size from *LINEINFO*
 - PROGRAMSUITE: SAS, Office, SPSS, etc

Step 2: Utilize Listing to Manage and Organize

```
data dirlist_useful;
  set dirlist;
  /*The path of the directory only appears once, using a retain statement to assign*/
  length directory $1000;
  retain directory;
  if left(upcase(lineinfo))=:'DIRECTORY OF' then directory=substr(left(lineinfo),14);

  /*Isolate Other Important information*/
  filename = substr(left(lineinfo),40);          /*Name of file inclu extension*/
  fileextens = scan(strip(lineinfo),-1);          /*File Type*/
  filedate = input(substr(lineinfo,1,10),?? mmddyy10.); /*MM/DD/YYYY */
  format filedate mmddyy10.;
  filetime = input(scan(lineinfo,4)||" "||scan(lineinfo,5),time12.); /*HH:MM AM/PM*/
  format filetime time12.;
```


Step 2: Utilize Listing to Manage and Organize

```
if month(filedate) < 10 then month =  
    put(year(filedate),4.)||"0"||put(month(filedate),1.);    /*Character YYYYMM*/  
if month(filedate) ge| 10 then month =  
    put(year(filedate),4.)||put(month(filedate),2.);  
  
/*Delete extraneous rows*/  
if lineinfo = '' then delete;  
if index(upcase(lineinfo),'<DIR>') then delete;  
if left(upcase(lineinfo)) =: 'VOLUME' then delete;  
if left(upcase(lineinfo))=: 'DIRECTORY OF' then delete;  
if fileextens in ('bytes' 'Listed:' 'free') then delete;  
run;
```

Step 2: Utilize Listing to Manage and Organize

- Excerpt from DIRLIST_USEFUL dataset

	directory	filename	fileextens	filedate	filetime	month
1	Y:\MyFiles	ADMINMedHGraphEnroll.html	html	04/08/2014	10:33:00	201404
2	Y:\MyFiles	AdminMHServicesRaceandGenderReport.html	html	03/20/2014	9:19:00	201403
3	Y:\MyFiles	adminMHStaffEncounter.html	html	09/28/2015	8:21:00	201509
4	Y:\MyFiles	ALLSITESMHAgregateReport.html	html	09/28/2015	8:17:00	201509
5	Y:\MyFiles	EnrollmentBarGraph.sas	sas	07/24/2015	8:58:00	201507
6	Y:\MyFiles	EnrollmentLineGraph.sas	sas	06/26/2015	13:19:00	201506
7	Y:\MyFiles	gchart.gif	gif	04/08/2014	4:04:00	201404
8	Y:\MyFiles	MH Encounter Summary by STAFFID.sas	sas	06/26/2015	13:19:00	201506
9	Y:\MyFiles	MH Medical Chart Review 12 Months ver 20150626.pdf	pdf	07/01/2015	9:14:00	201507
10	Y:\MyFiles	MH Medical Chart Review 18 Months ver 20150626.pdf	pdf	07/01/2015	9:14:00	201507
11	Y:\MyFiles	MH Medical Chart Review 24 Months ver 20150626.pdf	pdf	07/14/2015	13:11:00	201507

Step 3: Create New Directories

- Operating System ('x') commands can be used directly in a SAS session
- To suppress the RUN window, use the system option noxwait in your code
- Commands we'll consider today:
 - mkdir – makes a directory (option –p will avoid errors on preexisting dir)
 - move – relocates a file from one directory to another

Step 3: Create New Directories

```
proc sql;
    create table dir_typ_month as
    select distinct directory, fileextens, month
    from dirlist_useful;
quit;

%macro createdir(dir=,typ=,mon=);
    x "mkdir -p &dir.\&typ.\&mon.";
%mend createdir;

options noxwait;
data _null_;
    set dir_typ_month;
    command = cats('%createdir(dir=',directory,', typ=',
                    upcase(fileextens)', mon=',month,')');
    call execute(command);
run;
```

Step 3: Create New Directories

- Excerpted view of data _null_

	directory	fileextens	month	command
1	Y:\MyFiles	docx	201403	%createdir(dir=Y:\MyFiles, typ=DOCX, mon=201403);
2	Y:\MyFiles	gif	201309	%createdir(dir=Y:\MyFiles, typ=GIF, mon=201309);
3	Y:\MyFiles	gif	201404	%createdir(dir=Y:\MyFiles, typ=GIF, mon=201404);
4	Y:\MyFiles	html	201403	%createdir(dir=Y:\MyFiles, typ=HTML, mon=201403);
5	Y:\MyFiles	html	201404	%createdir(dir=Y:\MyFiles, typ=HTML, mon=201404);
6	Y:\MyFiles	html	201409	%createdir(dir=Y:\MyFiles, typ=HTML, mon=201409);
7	Y:\MyFiles	html	201509	%createdir(dir=Y:\MyFiles, typ=HTML, mon=201509);
8	Y:\MyFiles	jpg	201307	%createdir(dir=Y:\MyFiles, typ=JPG, mon=201307);
9	Y:\MyFiles	pdf	201310	%createdir(dir=Y:\MyFiles, typ=PDF, mon=201310);
10	Y:\MyFiles	pdf	201507	%createdir(dir=Y:\MyFiles, typ=PDF, mon=201507);
11	Y:\MyFiles	png	201307	%createdir(dir=Y:\MyFiles, typ=PNG, mon=201307);
12	Y:\MyFiles	pptx	201303	%createdir(dir=Y:\MyFiles, typ=PPTX, mon=201303);
13	Y:\MyFiles	sas	201501	%createdir(dir=Y:\MyFiles, typ=SAS, mon=201501);
14	Y:\MyFiles	sas	201505	%createdir(dir=Y:\MyFiles, typ=SAS, mon=201505);
15	Y:\MyFiles	sas	201506	%createdir(dir=Y:\MyFiles, typ=SAS, mon=201506);
16	Y:\MyFiles	sas	201507	%createdir(dir=Y:\MyFiles, typ=SAS, mon=201507);
17	Y:\MyFiles	sas	201508	%createdir(dir=Y:\MyFiles, typ=SAS, mon=201508);
18	Y:\MyFiles	sas7bdat	201310	%createdir(dir=Y:\MyFiles, typ=SAS7BDAT, mon=201310);
19	Y:\MyFiles	sas7bdat	201311	%createdir(dir=Y:\MyFiles, typ=SAS7BDAT, mon=201311);

Step 4: Move Files to New Folder Structure

```
%macro movfil(dir=,name=,typ=,mon=);  
    x move "&dir\&name" "&dir\&typ\&mon\&name";  
%mend movfil;  
  
data _null_;  
    set dirlist_useful;  
    command = cats('%movfil(dir=',directory,', name=',filename,  
                    ', typ=',upcase(fileextens),', mon=',month,')');  
    call execute(command);  
run;
```

Step 4: Move Files to New Folder Structure

fileextens	filedate	filetime	month	command
html	04/08/2014	10:33:00	201404	%movfil(dir=Y:\MyFiles, name=ADMINMedHGraphEnroll.html, typ=HTML, mon=201404);
html	03/20/2014	9:19:00	201403	%movfil(dir=Y:\MyFiles, name=AdminMHServicesRaceandGenderReport.html, typ=HTML, mon=201403);
html	09/28/2015	8:21:00	201509	%movfil(dir=Y:\MyFiles, name=adminMHStaffEncounter.html, typ=HTML, mon=201509);
html	09/28/2015	8:17:00	201509	%movfil(dir=Y:\MyFiles, name=ALLSITESMHAggregateReport.html, typ=HTML, mon=201509);
sas	07/24/2015	8:58:00	201507	%movfil(dir=Y:\MyFiles, name=EnrollmentBarGraph.sas, typ=SAS, mon=201507);
sas	06/26/2015	13:19:00	201506	%movfil(dir=Y:\MyFiles, name=EnrollmentLineGraph.sas, typ=SAS, mon=201506);
gif	04/08/2014	4:04:00	201404	%movfil(dir=Y:\MyFiles, name=gchart.gif, typ=GIF, mon=201404);
sas	06/26/2015	13:19:00	201506	%movfil(dir=Y:\MyFiles, name=MH Encounter Summary by STAFFID.sas, typ=SAS, mon=201506);
pdf	07/01/2015	9:14:00	201507	%movfil(dir=Y:\MyFiles, name=MH Medical Chart Review 12 Months ver 20150626.pdf, typ=PDF, mon=201507);
pdf	07/01/2015	9:14:00	201507	%movfil(dir=Y:\MyFiles, name=MH Medical Chart Review 18 Months ver 20150626.pdf, typ=PDF, mon=201507);

Step 4: Move Files to New Folder Structure

Name
ADMINMedHGraphEnroll.html
AdminMHServicesRaceandGenderReport...
adminMHStaffEncounter.html
ALLSITESMHAgregateReport.html
EnrollmentBarGraph.sas
EnrollmentLineGraph.sas
gchart.gif
MH Encounter Summary by STAFFID.sas
MH Medical Chart Review 6 Months ver ...
MH Medical Chart Review 12 Months ver...
MH Medical Chart Review 18 Months ver...
MH Medical Chart Review 24 Months ver...
MH project management MOP.docx
MH Site Summary for Team Meetings.sas
MH.jpg
MH.pdf
MH.png
mhaggregate20131010.sas7bdat

Name	Date modified
MyFiles	
DOCX	
201403	
GIF	
HTML	
JPG	
PDF	
PNG	
PPTX	
SAS	
201501	
201505	
201506	
201507	
201508	
SAS7BDAT	

Name	Date modified
MH Site Summary for Team Meetings.sas	8/26/2015 9
MHChartRev6.sas	8/10/2015 9
MHChartRev12.sas	8/26/2015 1
MHChartRev18.sas	8/26/2015 1
MHChartRev24.sas	8/26/2015 1
MHChartReviewTrackingReports.sas	8/26/2015 1
MHCreateData.sas	8/26/2015 1
MHheartretention.sas	8/26/2015 1
MHPatientTrackingReport.sas	8/26/2015 1

Conclusion

- Pipe devices and operating system commands are powerful ways to communicate with your network
- With thoughtful use of the call execute function, hundreds, if not thousands, of files can be manipulated in a matter of seconds
- Archiving files is just one of many possibilities for these powerful tools

References

- Creating a Directory Listing Using SAS for Windows
 - <http://support.sas.com/kb/24/820.html>
- Running Windows or MS-DOS Commands from within SAS
 - <https://support.sas.com/documentation/cdl/en/hostwin/63285/HTML/default/viewer.htm#exittemp.htm>
 - <http://www2.sas.com/proceedings/forum2008/092-2008.pdf>
- CALL EXECUTE Routine
 - <http://support.sas.com/documentation/cdl/en/mcrolref/61885/HTML/default/viewer.htm#a000543697.htm>

Contact

Emily K.Q. Sisson

Boston University School of Public Health

Data Coordinating Center

801 Massachusetts Avenue, 3rd Floor

Boston, Massachusetts 02118

(617) 638-5869

eq@bu.edu

Comments and Questions are valued and encouraged!