

Paper PO-05

A Macro to Change Windows Filenames

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ABSTRACT

I was recently asked to change all the file names in a series of folders by adding a numeric sequence number to each filename. The files were to be ordered by creation date and numbered independently of other folders. Renaming one file at a time can be extremely tedious especially when there could possibly be hundreds of files in a project folder. The program I wrote allowed me to rename all the project folder files in place using a data step, PROC SQL, and a simple Macro. This SAS® program eliminated the need to look at the files and avoided having to copy the entire folder while they were renamed. This program has saved me an enormous amount of time and energy which I then used for other projects.

INTRODUCTION

As a research assistant, you never really know what a principal researcher might need from you on a day to day basis. Some things are quite easy and some are very complex and take enormous amounts of time to complete. Many of the requests are repeated year after year and the process for completing those requests has also been in place for many years. I am always looking for ways to streamline these requests and possibly improve on the methods that are already in place.

I recently worked on a project that involved the collection of field data using a video camera. Video was taken of bicyclists riding in two separate locations before and after a sharrow was installed. A sharrow is a road marking that tells bicyclists and motorists that the roadway is to be shared. The video was collected over a couple of months and was then converted from .dvi format to .mp4 format. The newly formatted video was viewed and snapshots of bicyclists riding either northbound or southbound next to vehicles were pulled out, named, saved as .jpg formats and put into folders that represented either before or after the sharrow was installed. The pictures were given names that were long and contained information such as when they were taken either before or after the sharrow was installed and also in what direction the bicyclists were traveling, either northbound or southbound. The filenames also contained numbers that were produced by the conversion software and were very confusing and difficult to follow as shown by this example:

```
aftda07sb298_599.jpg  aftda07nb213_552.jpg  da10sb046_124.jpg
aftda07sb290_593.jpg  aftada07nb217_555.jpg  da09nb003_01.jpg
```

The only way to determine in what order the pictures were extracted was to view them in Windows Explorer, sorting by date modified. If you sorted the files by name, the creation times were completely mixed up. A solution to this problem was needed and I knew that SAS® was the way to go if I could access that date information from within SAS.

I was originally looking for a solution using cmd.exe and the Dir command. Dir displays a list of a directory's files and subdirectories. If you use Dir without any parameters, it will show the disk's volume label and serial number, followed by a list of directories and files on disk. This listing also includes the filenames and date and time each was last modified. The Syntax of the Dir command is as follows:

```
dir [Drive][:Path][FileName] [...] [/p] [/q] [/w] [/d] [/a[:attributes]] [/o[:Sort Order]]
[/t[:TimeField]] [/s] [/b] [/l] [/n] [/x] [/c] [/4].
```

There are many parameters of the Dir command and they can be found by typing dir /help, but we are only interested in the /b and /t parameters:

/t [[:] *TimeField*]: Specifies which time field to display or use for sorting. The following list describes each of the values you can use for *TimeField*.

Value	Description
c	Creation
a	Last access

Value	Description
w	Last written

/b: Lists each directory name or file name, one per line, including the file name extension. **/b** does not display heading information or a summary. **/b** overrides **/w**. (Hope Computer)

By using the Dir command with parameters of **/b /t**, I would be able to list the filenames sorted by creation time and showing only the filename, one filename per line.

I knew that I could rename the filenames in order of their creation times and prefix them with a number sequence starting from 1. The problem was that there were hundreds of files and multiple directories and it would have taken days to rename the files one at a time. Here comes SAS® to the rescue.

SAS under Windows allows unnamed pipes in a filename, which allow a user to “run a program outside the SAS® System and redirect the program’s input, output and error messages to the SAS® System. This allows a user to capture data from a program that is external to the SAS® System without creating an intermediate data file”. In other words, I could use the Dir command and Pipe command to read in the filenames as data. (SAS® Institute Inc.)

The program I wrote allowed me to rename all the files in place and saved me an enormous amount of time and energy.

Step one of my program was to change directories to the folder where the files were stored by using **x** to shell out to the operating system, and then **cd** to change directories.

```
x "cd X:\Folder where files are stored;
```

Step two was to create a libname to the present directory using the libname statement:

```
libname x ':';
```

Step three was to create a SAS table with 2 variables: File (the original file name) and x (the new file name). The length of the variables were determined by taking the original variable length of 'File' which was 50 and adding 4 digits to accommodate the numerical sequence I was going to add.

```
data Fla; length File $ 50 x $ 54;.
```

Step four was to assign a file name using the pipe device type to shell out to the operating system, issue the Dir command and retrieve all files with the .jpg extension using the **/b** (bare format) and **/t** (the time the file was originally created).

```
filename a pipe 'dir *.jpg /b /t';
```

Step five was to pull in our file name 'a' containing the two variables 'File' and 'x' by using the infile command and Input Statement. The put command with the parameter (**_n_,z3**) which adds a 3 digit number with leading zeros is concatenated with **'_'** to the variable 'File' to produce our 'x' variable so da10sb046_124.jpg becomes 001_da10sb046_124.jpg

```
infile a; input File; x=put (_n_,z3.)||"_"||File; run;
```

Step six was to use Proc Sql to create the macro variable &x and select the total number of observations into &x from the SAS table of filenames. Using the number of observations as the upper limit, I read the old and new filenames into two parallel sets of macro variables.

```
proc sql;
select count(*) into :x from Fla;
select File,x into :frm1-:frm%left(&x), :too1 - :too%left(&x) from Fla;quit;
```

Step seven tells SAS to continue processing and not wait for the shell window to close.

```
options noxwait;
```

Step eight makes the macro continue until the last observation &x. Then rename or 'ren' can be used to change the name of the file and the mend statement closes our macro.

```
%macro renfile;
data _null_;
%do i=1 %to &x;
x "rename &&frm&i &&too&i
%end; run;
%mend renfile
```

Step nine calls the macro.
`%renfile;`

CONCLUSION

This SAS® program allows me to rename hundreds of files in a matter of seconds not using any additional disk space and has saved me time and effort which I was then able to direct to other projects. Another example of the flexibility of SAS® and the many applications it can be used with.

REFERENCES

Hope, Computer. "Microsoft DOS dir command." (2011): 1. 7-26-2011 <<http://www.computerhope.com/dirhlp.htm>>.

SAS®Institute Inc. "SAS® Companion for Windows." Title of Online Publication Second Edition (2011): 1-2. 7-26-2011 <<http://support.sas.com/documentation/cdl/en/hostwin/63285/HTML/default/viewer.htm#unnamed.htm>>.

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