Paper 191-2010

A VB.NET utility to transfer multiple data files between SAS® and Microsoft® Access/Excel by automatically generating SAS® Import/Export statements

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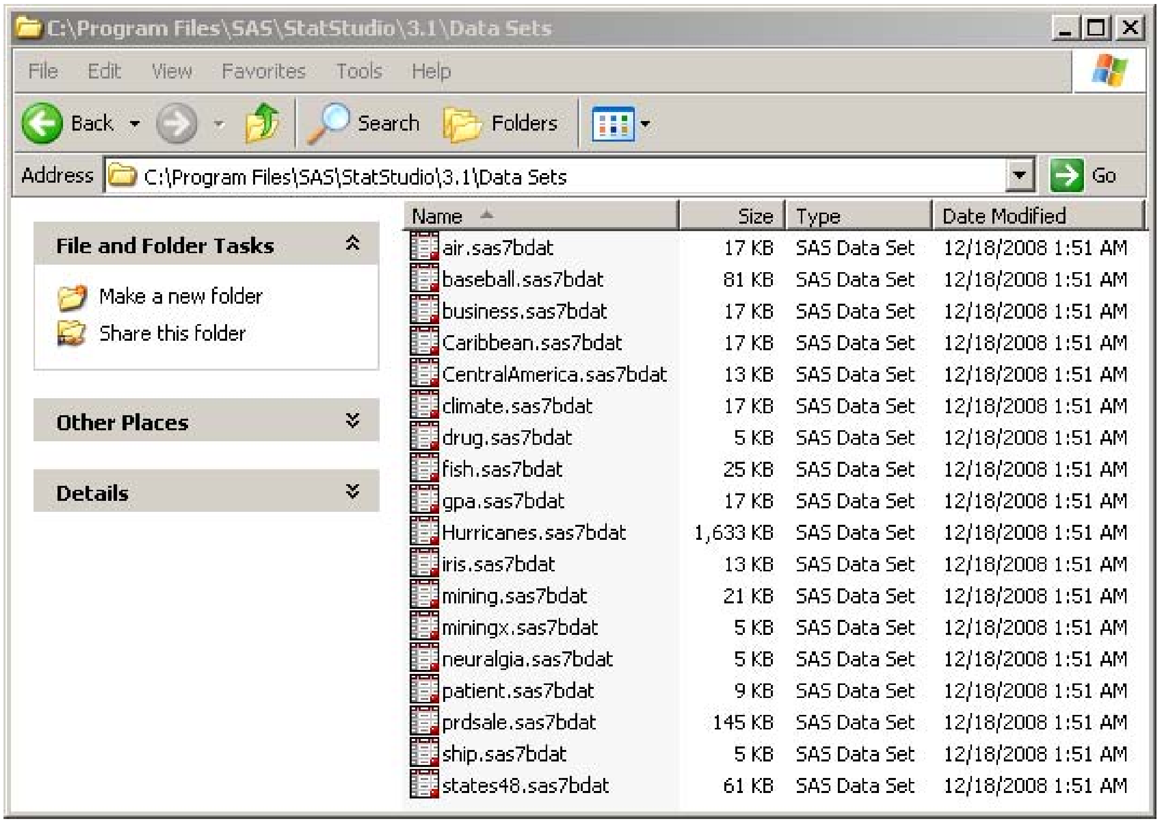
ABSTRACT

A VB.NET utility was developed to automate the process of converting data files between SAS® and Microsoft Access or Microsoft Excel using point-and-click in the Windows environment. It saves time and avoids mistakes by automatically generating SAS import/export statements. This utility illustrates an easier and faster production application development in VB.NET, an ideal tool for SAS bulk-statement generation. Any SAS user can use this utility in Windows. This application is free during the conference or by submitting an email request to ezsasdc@yahoo.com.

INTRODUCTION

In studies, it is not uncommon for researchers to collect data using Microsoft® Access or Excel and later convert/import these data files to SAS® format for analyses. Traditionally, SAS® Import/Export wizard can be used to convert these Access/Excel files to SAS®. Alternatively, SAS® procedure PROC IMPORT can be used repeatedly (with copy and paste) or in a Macro to shorten the statements. The process, although straightforward, can be tedious and time-consuming, especially when there are hundreds or even thousands of files to be converted or imported. To expedite the process and to avoid mistakes, a VB.NET utility, EZSASDC, was developed to automatically convert data files between Access or Excel and SAS, by simple point-n-click in the Windows® environment. The utility generates SAS® Import/Export statements automatically.

The following sections demonstrate the traditional methods of Import/Export in SAS® (Base SAS® 9.2 and SAS® Enterprise Guide 4.2) and the application of EZSASDC utility in converting data files. We use the SAS® sample data (18 files) located in “C:\Program Files\SAS\StatStudio\3.1\Data Sets” (locations may vary depending on the installation options) for the demonstration (Figure 1).



Address C:\Program Files\SAS\StatStudio\3.1\Data Sets

Name	Size	Type	Date Modified
air.sas7bdat	17 KB	SAS Data Set	12/18/2008 1:51 AM
baseball.sas7bdat	81 KB	SAS Data Set	12/18/2008 1:51 AM
business.sas7bdat	17 KB	SAS Data Set	12/18/2008 1:51 AM
Caribbean.sas7bdat	17 KB	SAS Data Set	12/18/2008 1:51 AM
CentralAmerica.sas7bdat	13 KB	SAS Data Set	12/18/2008 1:51 AM
climate.sas7bdat	17 KB	SAS Data Set	12/18/2008 1:51 AM
drug.sas7bdat	5 KB	SAS Data Set	12/18/2008 1:51 AM
fish.sas7bdat	25 KB	SAS Data Set	12/18/2008 1:51 AM
gpa.sas7bdat	17 KB	SAS Data Set	12/18/2008 1:51 AM
Hurricanes.sas7bdat	1,633 KB	SAS Data Set	12/18/2008 1:51 AM
iris.sas7bdat	13 KB	SAS Data Set	12/18/2008 1:51 AM
mining.sas7bdat	21 KB	SAS Data Set	12/18/2008 1:51 AM
miningx.sas7bdat	5 KB	SAS Data Set	12/18/2008 1:51 AM
neuralgia.sas7bdat	5 KB	SAS Data Set	12/18/2008 1:51 AM
patient.sas7bdat	9 KB	SAS Data Set	12/18/2008 1:51 AM
prdsale.sas7bdat	145 KB	SAS Data Set	12/18/2008 1:51 AM
ship.sas7bdat	5 KB	SAS Data Set	12/18/2008 1:51 AM
states48.sas7bdat	61 KB	SAS Data Set	12/18/2008 1:51 AM

Figure 1. SAS® sample data files

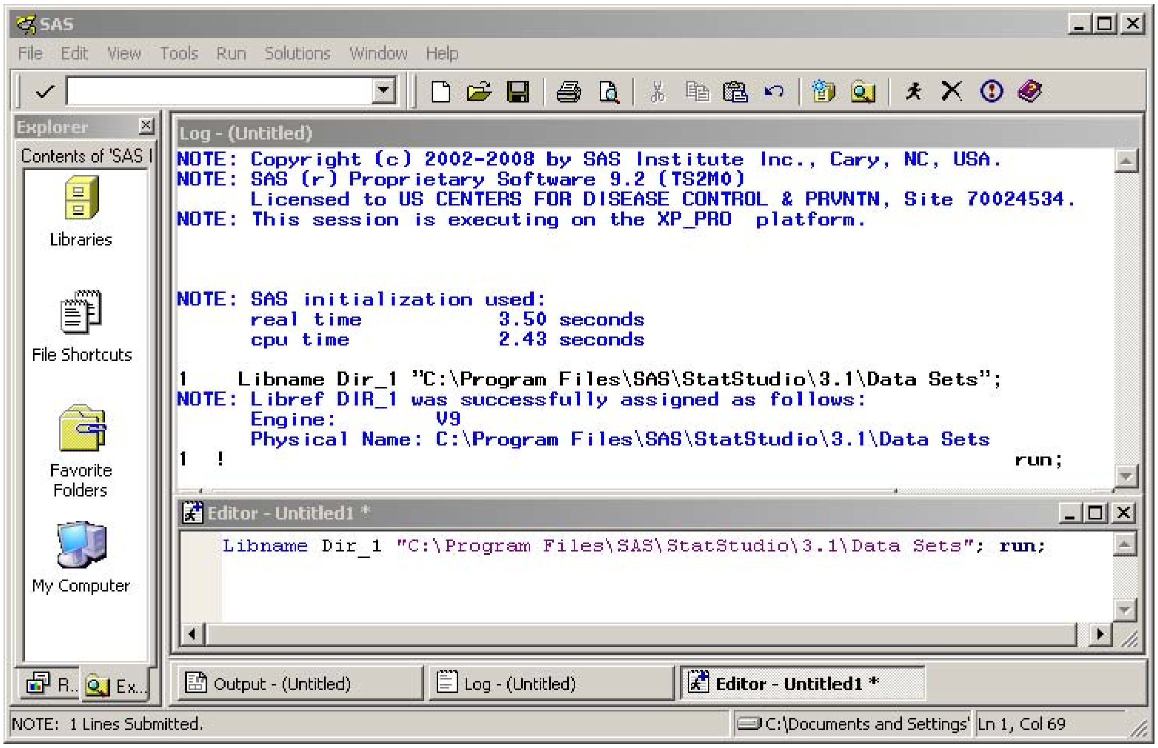
EXAMPLE: CONVERT SAS® DATA TO MICROSOFT® ACCESS

Method 1: Base SAS® 9.2

- Create a blank Access database named as SAS_Access_Method1.mdb in "C:\SAS2ACCESS".
- Create Library Dir_1 by running one SAS statement (Figure 2).
- Click File-> Export Data and follow the Export Wizard prompt; select all default options and SAS data set Air as the first table to export; and save the Export statements in SAS_Access_Method1.sas.
- Open SAS_Access_Method1.sas to show the automatically generated PROC EXPORT statements:

```
PROC EXPORT DATA= DIR_1.AIR
      OUTTABLE= "Air"
      DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method1.mdb";
RUN;
```

- Copy and paste the statements 17 times for the rest of the data files then change "Air" to appropriate file names shown in Figure 1.
- RUN the statements and all of the 18 SAS data files are now exported to SAS_Access_Method1.mdb



```
NOTE: Copyright (c) 2002-2008 by SAS Institute Inc., Cary, NC, USA.
NOTE: SAS (r) Proprietary Software 9.2 (TS2M0)
      Licensed to US CENTERS FOR DISEASE CONTROL & PRVNTN, Site 70024534.
NOTE: This session is executing on the XP_PRO  platform.



NOTE: SAS initialization used:
      real time           3.50 seconds
      cpu time            2.43 seconds

1     Libname Dir_1 "C:\Program Files\SAS\StatStudio\3.1\Data Sets";
NOTE: Libref DIR_1 was successfully assigned as follows:
      Engine:        V9
      Physical Name: C:\Program Files\SAS\StatStudio\3.1\Data Sets
1   !                                                            run;
```

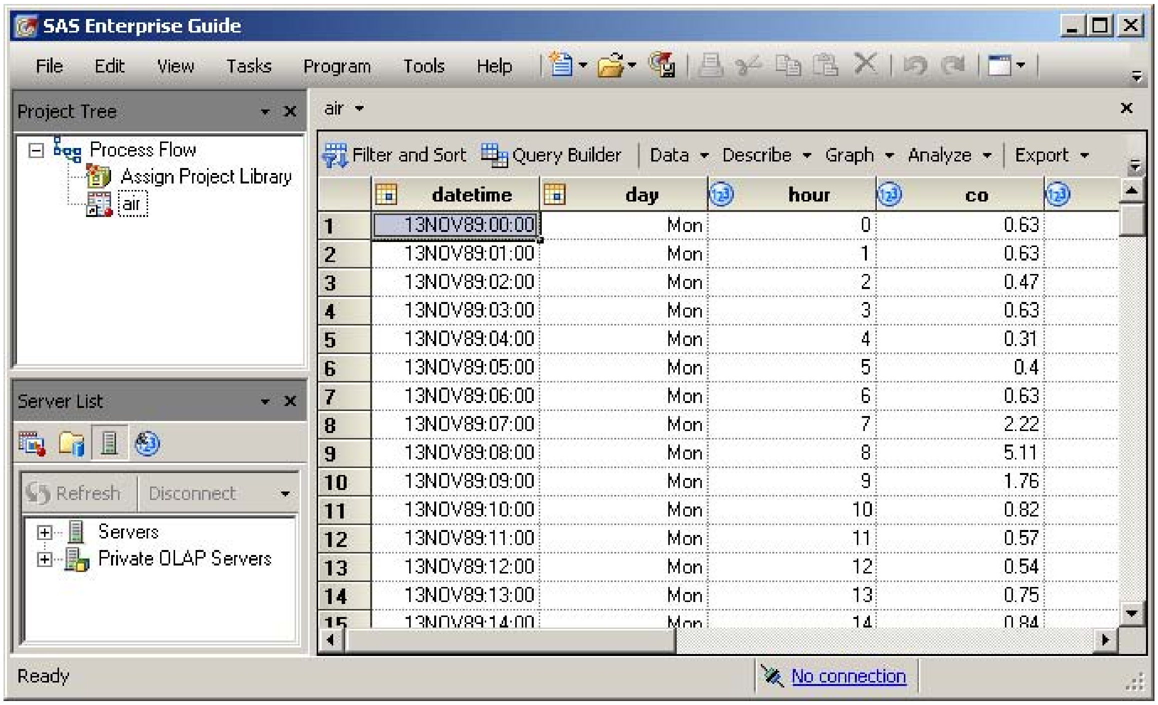
```
Libname Dir_1 "C:\Program Files\SAS\StatStudio\3.1\Data Sets"; run;
```

NOTE: 1 Lines Submitted.

Figure 2. Statement to create library Dir_1

Method 2: SAS® Enterprise Guide 4.2

- Open the SAS® Enterprise Guide 4.2 and build a new project (Tool-> Assign Project Library then follow the prompts to build a SAS Library DIR_1) for "C:\Program Files\SAS\StatStudio\3.1\Data Sets".
- Open SAS data set "Air" (File->Open->Data and Select Export "air") or Export air As Step In Project and then follow prompts to set up export process to SAS_Access_Method2.mdb (Figure 3).
- Repeat Step 2 for 17 more times to export the rest of the SAS files to Access.

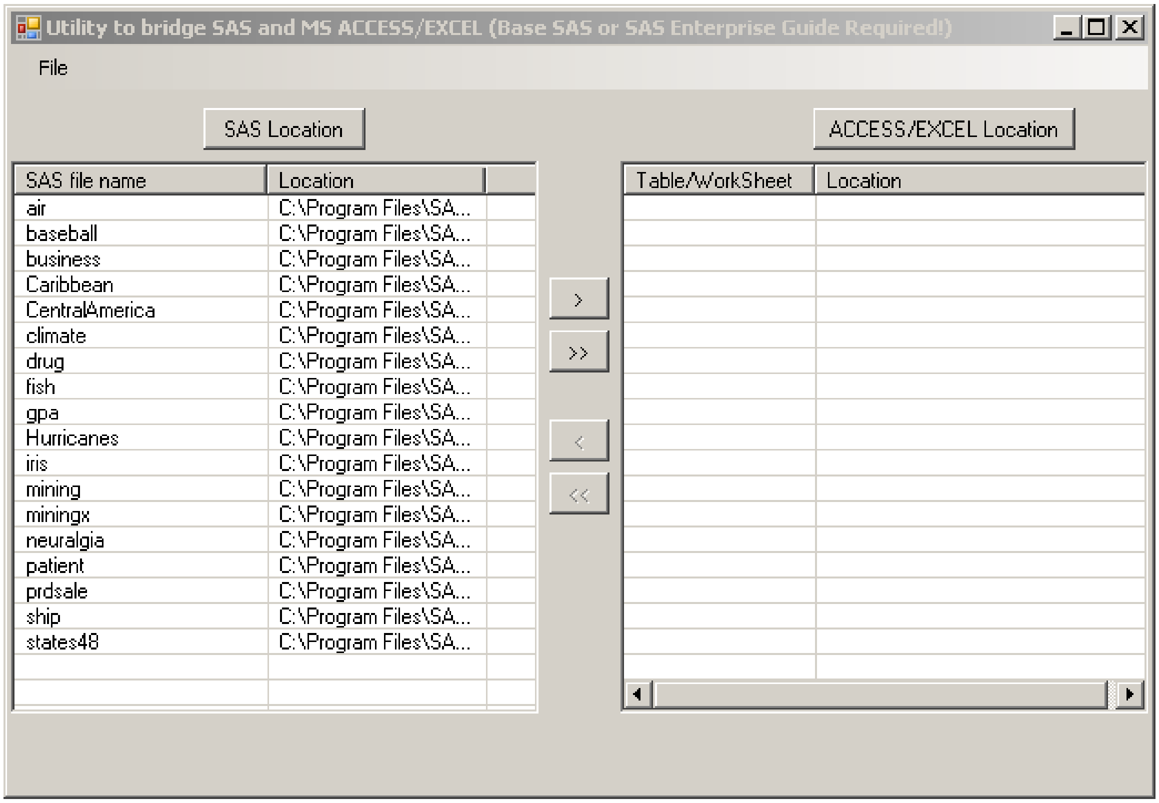


	datetime	day	hour	co
1	13NOV89:00:00	Mon	0	0.63
2	13NOV89:01:00	Mon	1	0.63
3	13NOV89:02:00	Mon	2	0.47
4	13NOV89:03:00	Mon	3	0.63
5	13NOV89:04:00	Mon	4	0.31
6	13NOV89:05:00	Mon	5	0.4
7	13NOV89:06:00	Mon	6	0.63
8	13NOV89:07:00	Mon	7	2.22
9	13NOV89:08:00	Mon	8	5.11
10	13NOV89:09:00	Mon	9	1.76
11	13NOV89:10:00	Mon	10	0.82
12	13NOV89:11:00	Mon	11	0.57
13	13NOV89:12:00	Mon	12	0.54
14	13NOV89:13:00	Mon	13	0.75
15	13NOV89:14:00	Mon	14	0.84

Figure 3. Export files using SAS® Enterprise Guide 4.2

Method 3: EZSASDC utility

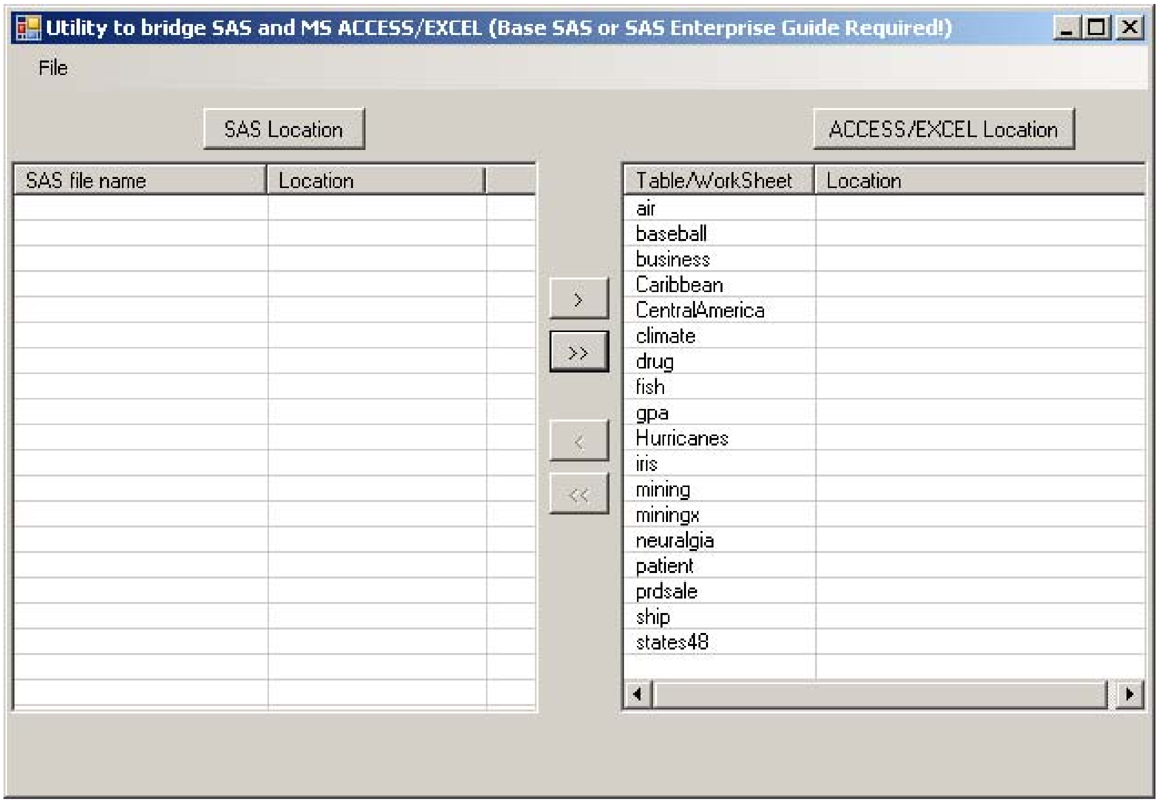
- Open EZSASDC. Click the ‘SAS Location’ button and select “C:\Program Files\SAS\StatStudio\3.1\Data Sets”. All the SAS data set names will show up on the left List Box. (Figure 4)
- Click the >> button to export all SAS files on the left list box to Access/Excel (Figure 5)
- Click the ACCESS/EXCEL Location button and type “SAS_Access_Method3.mdb” in “C:\SAS2ACCESS”, then click OPEN. The default SAS program reader, either SAS® 9.2 (Figure 6) or SAS® Enterprise Guide 4.2 (Figure 7) opens with all the SAS® PROC EXPORT statements!
- Click 🏃 in SAS® 9.2 or ▷ Run in SAS® Enterprise Guide 4.2!


Utility to bridge SAS and MS ACCESS/EXCEL (Base SAS or SAS Enterprise Guide Required!)
File
SAS Location
ACCESS/EXCEL Location
>
>>
<
<<

SAS file name	Location
air	C:\Program Files\SA...
baseball	C:\Program Files\SA...
business	C:\Program Files\SA...
Caribbean	C:\Program Files\SA...
CentralAmerica	C:\Program Files\SA...
climate	C:\Program Files\SA...
drug	C:\Program Files\SA...
fish	C:\Program Files\SA...
gpa	C:\Program Files\SA...
Hurricanes	C:\Program Files\SA...
iris	C:\Program Files\SA...
mining	C:\Program Files\SA...
miningx	C:\Program Files\SA...
neuralgia	C:\Program Files\SA...
patient	C:\Program Files\SA...
prdsale	C:\Program Files\SA...
ship	C:\Program Files\SA...
states48	C:\Program Files\SA...

Table/WorkSheet	Location

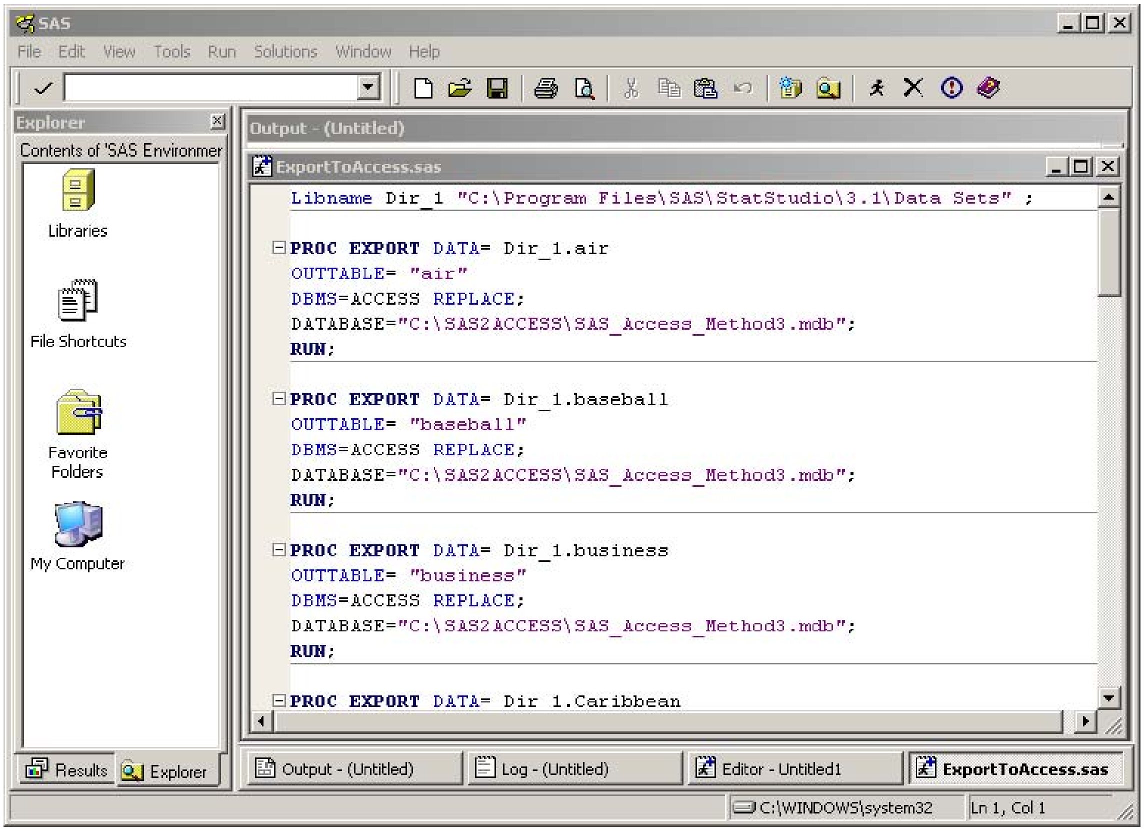
Figure 4. Select SAS® data file location in EZSASDC utility


Utility to bridge SAS and MS ACCESS/EXCEL (Base SAS or SAS Enterprise Guide Required!)
File
SAS Location
ACCESS/EXCEL Location
>
>>
<
<<

SAS file name	Location

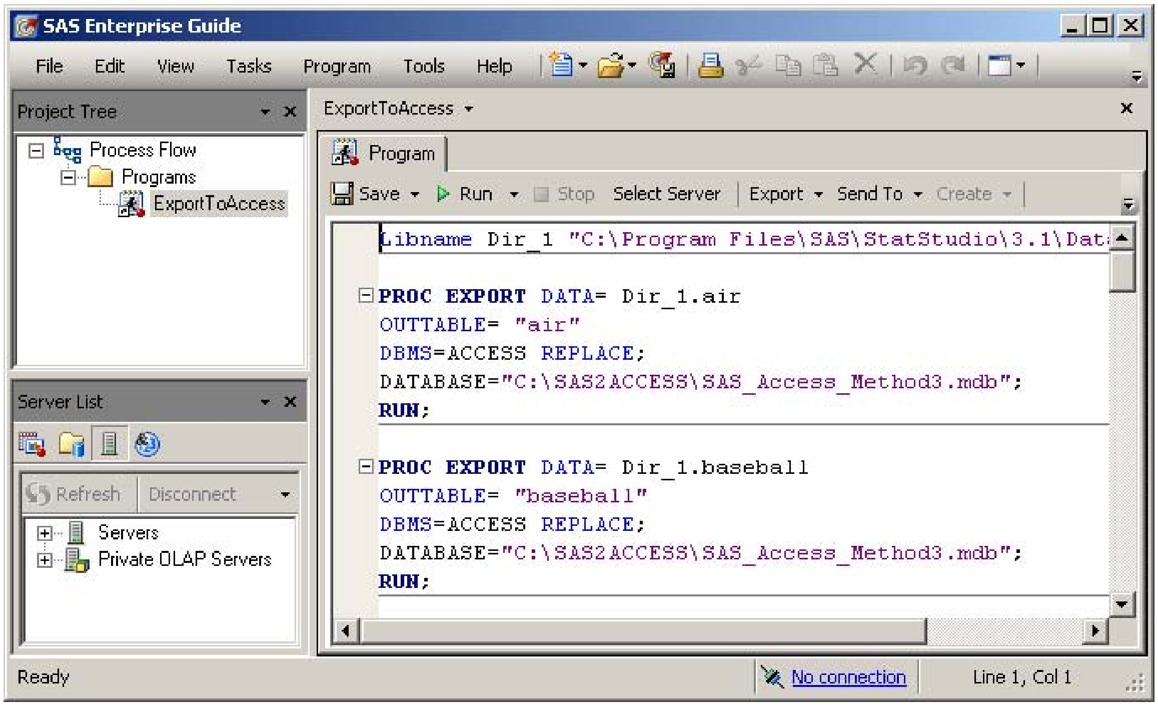
Table/WorkSheet	Location
air	
baseball	
business	
Caribbean	
CentralAmerica	
climate	
drug	
fish	
gpa	
Hurricanes	
iris	
mining	
miningx	
neuralgia	
patient	
prdsale	
ship	
states48	

Figure 5. SAS® files to be exported to Access/Excel



```
Libname Dir_1 "C:\Program Files\SAS\StatStudio\3.1\Data Sets" ;

PROC EXPORT DATA= Dir_1.air
OUTTABLE= "air"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.baseball
OUTTABLE= "baseball"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.business
OUTTABLE= "business"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.Caribbean
```

Figure 6. SAS® PROC EXPORT statements automatically generated in SAS® 9.2



```
Libname Dir_1 "C:\Program Files\SAS\StatStudio\3.1\Dat

PROC EXPORT DATA= Dir_1.air
OUTTABLE= "air"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.baseball
OUTTABLE= "baseball"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;
```

Figure 7. SAS® PROC EXPORT statements automatically generated in Enterprise Guide 4.2

DEVELOPING PROCESS

Microsoft® VB.NET is a very popular developing tool that is famous for its fast RAD and rich GUI. The real application development is straightforward from the inception of the design idea. Figure 8 shows the overall design diagram. Figure 9 shows the finished GUI.

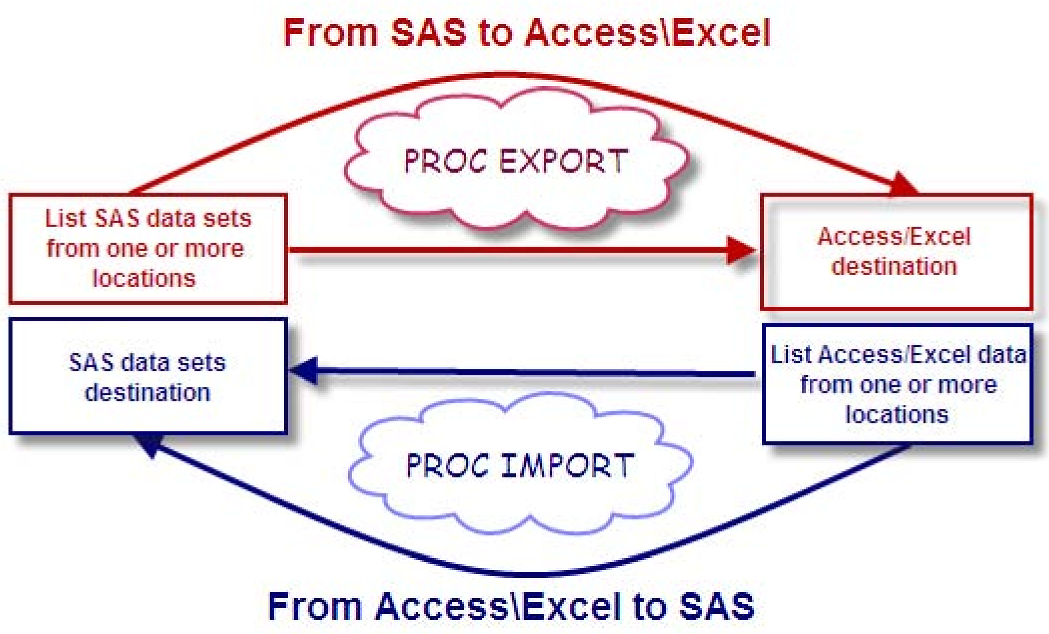

From SAS to Access\Excel
PROC EXPORT
List SAS data sets from one or more locations
Access/Excel destination
SAS data sets destination
List Access/Excel data from one or more locations
PROC IMPORT
From Access\Excel to SAS

Figure 8. Design Diagram

A sample VB.NET code below illustrates how all SAS® data sets in "C:\Program Files\SAS\StatStudio\3.1\Data Sets" are read and how all the SAS® EXPORT statements are generated to export the data to an existing Access database (C:\SAS2ACCESS\SAS_Access_Method1.mdb):

```
Dim path As String = "C:\Program Files\SAS\StatStudio\3.1\Data Sets"
Dim searchPattern As String = "*.sas7b*at"
Dim di As DirectoryInfo = New DirectoryInfo(path)
Dim files() As FileInfo = _
        di.GetFiles(searchPattern, SearchOption.TopDirectoryOnly)
Dim file As FileInfo
Dim strSAS As String = ""
    strSAS = "Libname SAS_DIR ""C:\SAS2ACCESS\"" ; " + vbNewLine
    For Each file In files
        Dim strFileName As String = ""
        strFileName = file.Name
        strFileName = strFileName.Substring(0, strFileName.Length - 9)
        strSAS += "PROC EXPORT DATA= SAS_DIR." + strFileName + vbNewLine
        strSAS += "OUTTABLE= """ + strFileName + """" + vbNewLine
        strSAS += "DBMS=ACCESS REPLACE;" + vbNewLine
        strSAS += "DATABASE=""C:\SAS2ACESS\SAS_Access_Method1.mdb"";" _
               + vbNewLine
        strSAS += "RUN;" + vbNewLine
    Next file
    Dim objWriter As New System.IO.StreamWriter("C:\test.sas")

    objWriter.Write(strSAS)
    objWriter.Close()

    Process.Start("C:\test.sas")
```

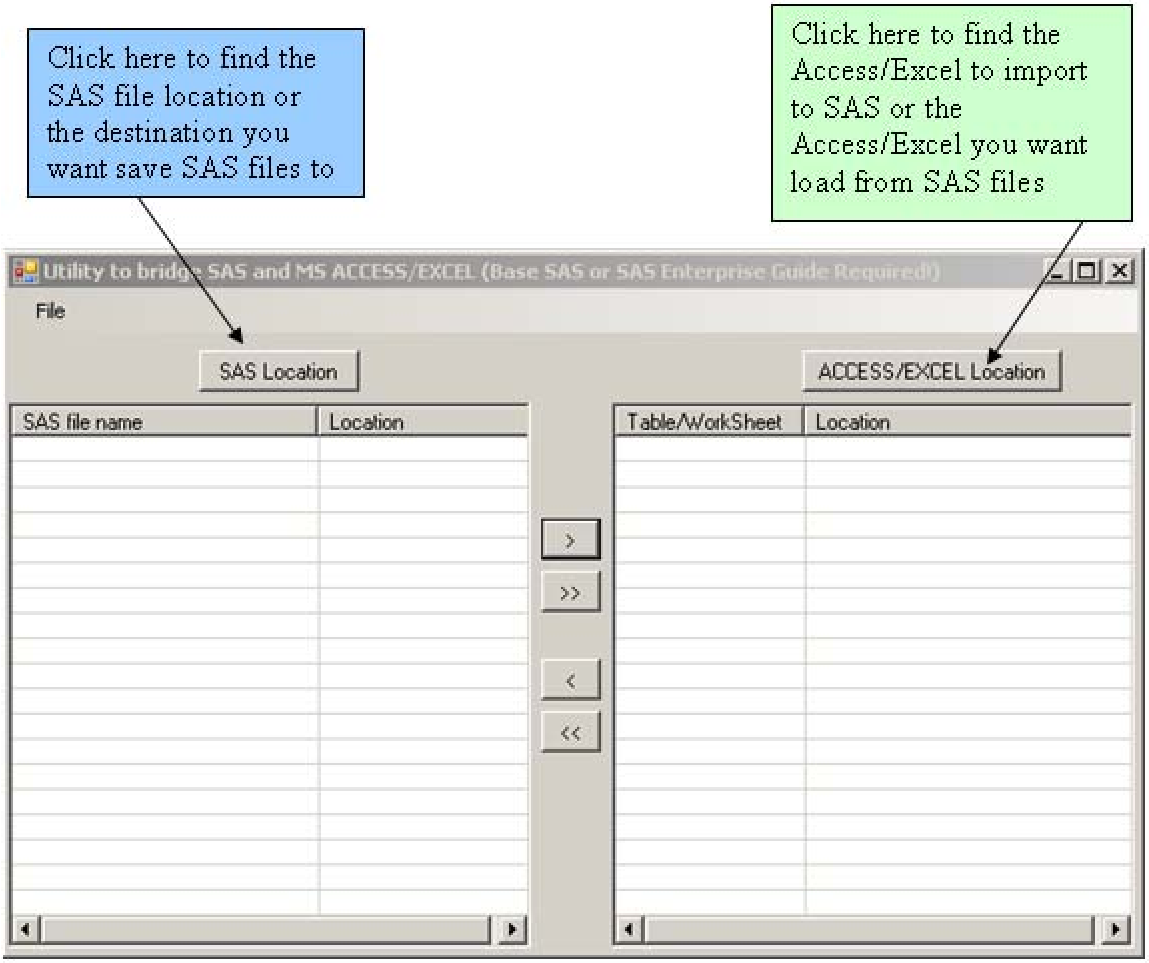

Click here to find the SAS file location or the destination you want save SAS files to
Click here to find the Access/Excel to import to SAS or the Access/Excel you want load from SAS files
Utility to bridge SAS and MS ACCESS/EXCEL (Base SAS or SAS Enterprise Guide Required)
File
SAS Location
ACCESS/EXCEL Location
SAS file name
Location
Table/WorkSheet
Location
>
>>
<
<<

Figure 9. Finished GUI

CONCLUSION

As demonstrated above, this utility has the advantage of converting data files (Import/Export) between SAS® and Access/Excel on batch mode. In the future, we plan to add more options, such as the inclusion of SAS® Access/Excel engine, the use of ODS, and the support of Excel 2010, Access 2010, .sd2 and .sd7 file format. The same developing idea can be used to develop other applications for SAS® production programs, such as Macros and ODS. There are endless opportunities for SAS® programmers at any level to benefit from this point-n-click approach.

EZSASDC UTILITY REQUIREMENTS:

1. Import/Export SAS® .sas7bdat datasets and read .sas7bcat SAS® FORMAT
2. Import/Export Access 2000-2007 and Excel 2000-2007
3. Window XP Professional (should work on Windows Vista or Windows 7, but these platforms are untested)
4. .NET framework 3.5, which is available for download at http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=333325fd-ae52-4e35-b531-508d977d32a6
5. Base SAS® 9.2 (Base SAS® 8 or Base SAS® 9.1.3 should work) or SAS® Enterprise 4.2 (earlier versions should work as long as they use the same PROC IMPORT/EXPORT)

REFERENCES

- Paper 004-2007: Compson, Michael L. Hennessey, John C. *How Suite It Is – Taking Full Advantage of SAS® Seamless Integration with Microsoft's Office Suite*
- SGF 2007 Paper 001-2007: *How to Generate 10,000 Excel Spreadsheets in 10 Minutes (Or Less)*
- Paper 025-2009: Benjamin Jr, William E. *So, You've Got Data Enterprise Wide (SAS®, ACCESS, EXCEL,*

MySQL, and Others); Well, Let SAS® Enterprise Guide® Software Point-n-Click Your Way to Using It

- SAS Excels. Genald Frey. http://www.sys-seminar.com/pdfs/sas_excels.pdf
- What's New in SAS® Enterprise Guide® 4.2. Chris Hemedinger and Anand Chitale. http://support.sas.com/resources/papers/proceedings09/320-2009.pdf

CONTACT INFORMATION

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Cincinnati, OH 45226
513-841-4271
James.Yiin@cdc.hhs.gov

APPENDIX

```
Libname Dir_1 "C:\Program Files\SAS\StatStudio\3.1\Data Sets" ;

PROC EXPORT DATA= Dir_1.air
OUTTABLE= "air"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.baseball
OUTTABLE= "baseball"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.business
OUTTABLE= "business"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.Caribbean
OUTTABLE= "Caribbean"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.CentralAmerica
OUTTABLE= "CentralAmerica"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;
```

```
PROC EXPORT DATA= Dir_1.climate
OUTTABLE= "climate"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.drug
OUTTABLE= "drug"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.fish
OUTTABLE= "fish"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.gpa
OUTTABLE= "gpa"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.Hurricanes
OUTTABLE= "Hurricanes"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.iris
OUTTABLE= "iris"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.mining
OUTTABLE= "mining"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.miningx
OUTTABLE= "miningx"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.neuralgia
OUTTABLE= "neuralgia"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.patient
OUTTABLE= "patient"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.prdsale
OUTTABLE= "prdsale"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.ship
```

```
OUTTABLE= "ship"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

PROC EXPORT DATA= Dir_1.states48
OUTTABLE= "states48"
DBMS=ACCESS REPLACE;
DATABASE="C:\SAS2ACCESS\SAS_Access_Method3.mdb";
RUN;

Libname Dir_1 ;
```