

## **JMP®, Excel®, and SAS® Connectivity**

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### **ABSTRACT**

Isn't Microsoft Excel the most used software in the world? Isn't JMP the best in the world for statistical graphics and data discovery? And isn't SAS software the gold standard for robust and reliable analysis? Combine these three with easy connectivity and you have everything you need. Depending on requirements, your (1) input, (2) discovery and analysis, and (3) final display and reporting can begin with any of the three and end with any of the three. We demonstrate the most likely paths that emphasize JMP capabilities. A lively discussion will continue in the hallway!

### **INTRODUCTION**

The importance of Excel has been established in the marketplace. SAS and JMP users learn to bring in and export Excel files easily. Introduced at the 2013 JMP Discovery Summit in San Antonio Texas in September, Version 11 of JMP includes an Excel Wizard under Windows to include titles and formulas.

Similarly, JMP is the best in the world for data statistical discovery using graphics and tables. If you do design of experiments (DOE) you know that JMP leads the way in this scientific technology.

In our presentation, we illustrate file movement with design of experiment and product testing—we then turn to the full SAS package for variable-factor final modeling to further refine final equations and choices. Note that design of experiments and modeling can apply to products, services, or decisions in management.

### **IMPORTING**

Excel files can be easily imported to JMP using JMP's Excel Wizard. It runs under Microsoft Windows.

SAS files are also easy to import to JMP. Just select OPEN under the FILE menu (or from the JMP Starter window) and JMP will recognize the file as a SAS file. Rows and columns will come in the same into the JMP table as they stand in the SAS table.

JMP table-files are likewise easily imported and saved as SAS tables.

Refer to the diagram on the next page as we consider details in order, by the diagram numbers:

#### **1. IMPORTING EXCEL FILES INTO JMP**

For Macintosh users, they can drag across the needed rows and columns to copy to the clipboard, and they paste into a JMP table. They then double-click on the column headings and type them in.

For PC/Windows users there is a JMP option to simply open the file using OPEN under FILE and by selecting the Excel file, the Excel Wizard will allow the proper options to be chosen. Display 1 is an example of the Excel Wizard used by JMP.

#### **2. IMPORTING SAS FILES INTO JMP**

Under FILE select OPEN and select the SAS file. It will come in since structure is the same. You can equally select OPEN under the JMP Starter window.

#### **3. IMPORTING EXCEL FILES INTO SAS**

Under FILE select OPEN and select the Excel file. The Excel Wizard will allow the proper options to be chosen. Columns, rows, column titles, and formulas will come across to the SAS table. See Display 2.

#### **4. IMPORTING JMP FILES INTO SAS**

Under FILE select OPEN and select the SAS file. It will come in since structure is the same.

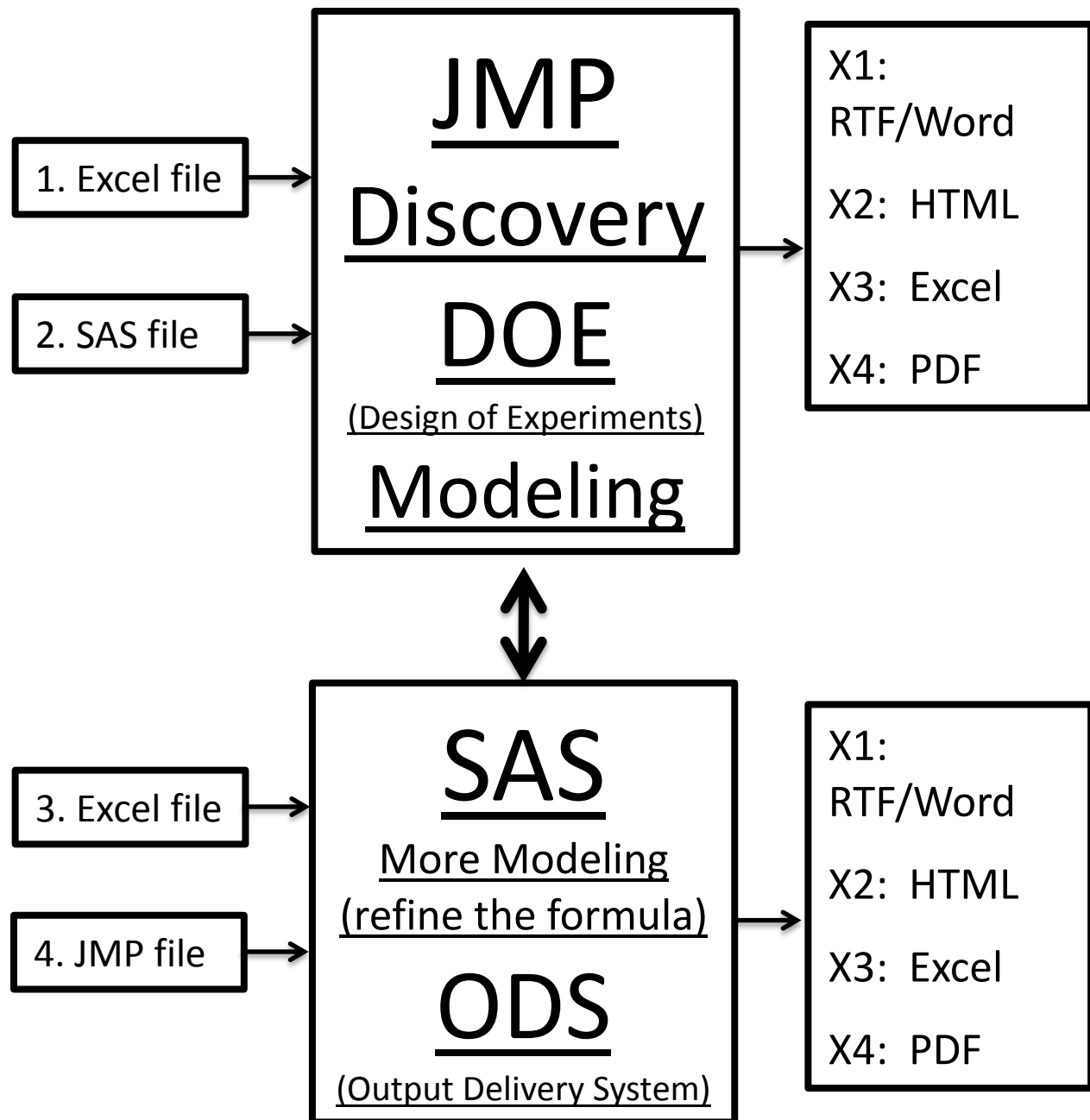


Figure 1. Input, connectivity, and export/output

#### THE IMPORTANCE OF MODELING

In our example we move an Excel file containing Plackett-Burman specifications for design of experiment into JMP to create alternate design models. Further, we move the results into SAS for further modeling and refining the defining equations.

An example of the Excel Wizard used by JMP is illustrated in Figure 2, below.

**Excel Import Wizard**

**Data Preview**

	X1	X2	X3	X4	Y	
1	-11	-1	X	A	18.33	
2	-12	-1	X	B	10.21	
3	-13	-1	X	C	-2	
4	-14	-1	X	D	-14.02	
5	-21	-1	Y	A	-21.37	
6	-22	-1	Y	B	-32.28	
7	-23	-1	Y	C	-36.99	
8	-24	-1	Y	D	-46.6	
9	-31	-1	Z	A	-56.95	
10	-32	-1	Z	B	-66.74	
11	-33	-1	Z	C	-75.84	
12	-34	-1	Z	D	-83	
13	11	1	X	A	-74.18	
14	12	1	X	B	-64.9	

Rows Shown: 14 / 14

**Worksheets**

Select sheets to open	Custom setting
Sheet1	<input type="checkbox"/>

**Individual Worksheet Settings**

☒ Worksheet contains column headers

Column headers start on row

Number of rows with column headers

Data starts on row

Data starts on column

☐ Concatenate worksheets and try to match columns

☐ Create column with worksheet name when concatenating

☒ Use for all worksheets

**Preview Pane Refresh**

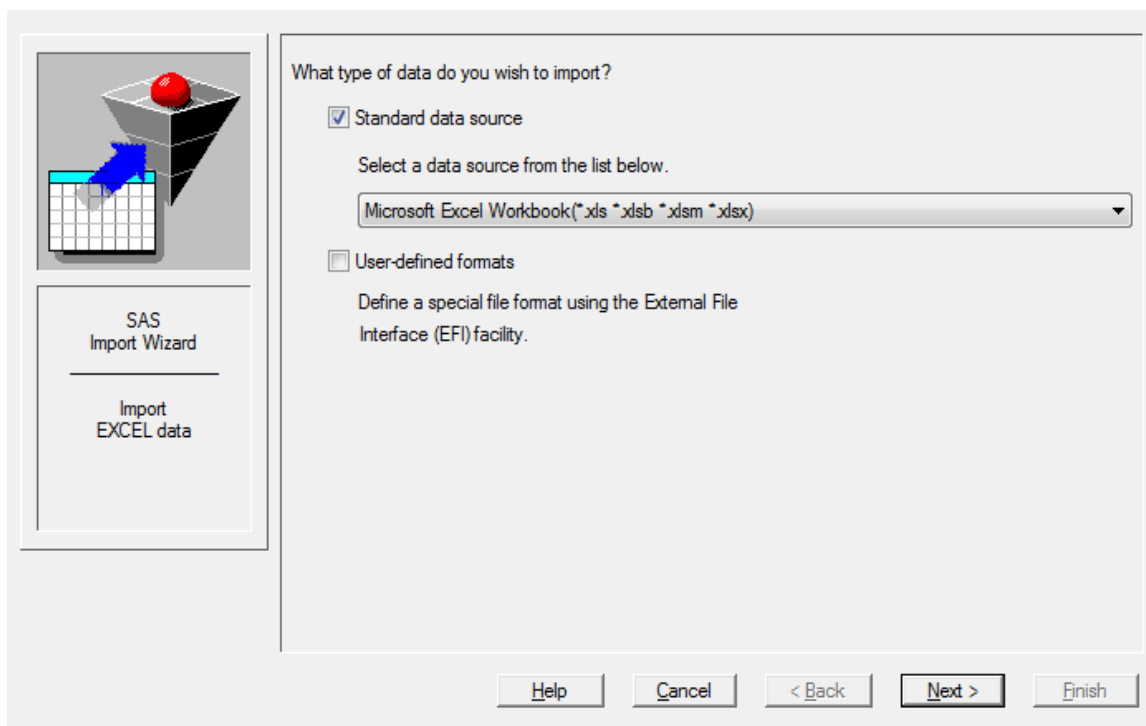
☒ Update settings on any change

Figure 2. Excel Wizard used by JMP

## THE IMPORTANCE OF EASE

We can use the Output Delivery System (ODS) of SAS to easily move the resulting output and/or results to a number of output mediums (destinations), as illustrated in Figure 4. Alternately, we could use the new SAS 9.3 ODS Statistical Graphics to create new graphical images and drill-down applications.

An example of the Excel Wizard used by SAS is illustrated in Figure 3, below.



(continued)

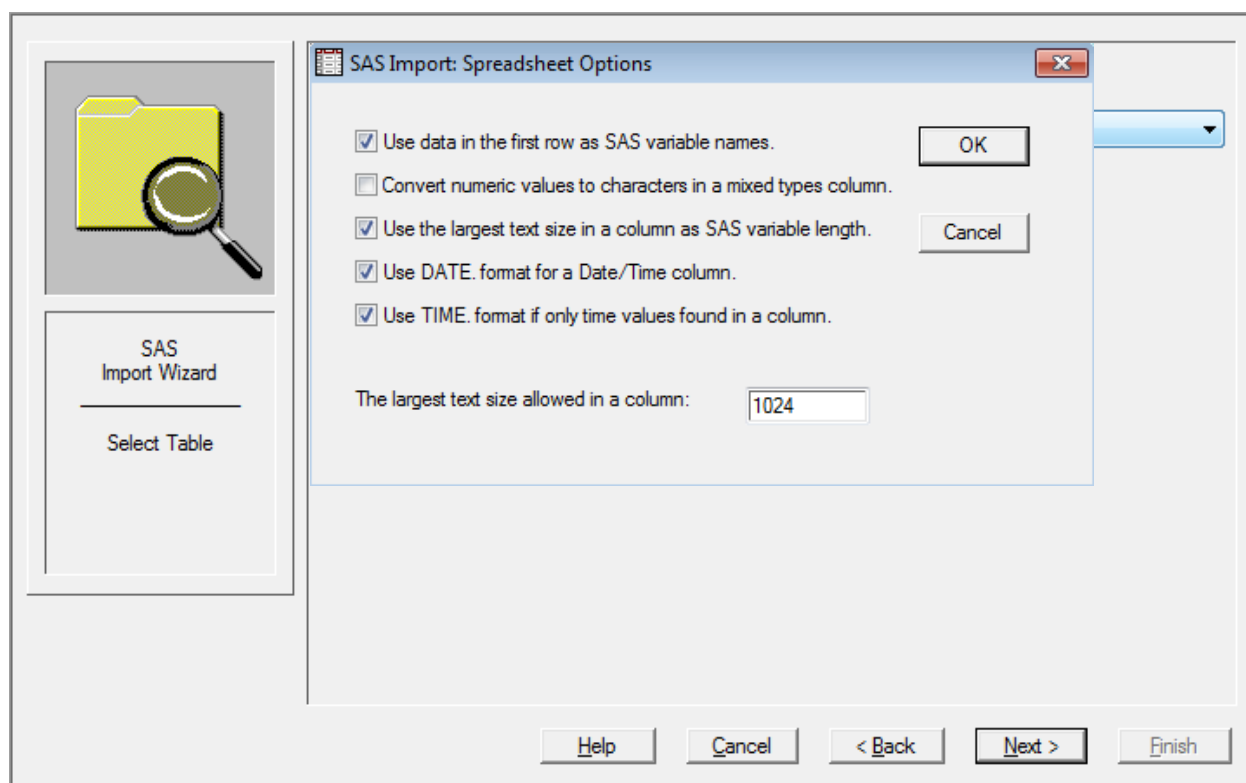


Figure 3. Excel Wizard used by SAS

## EXPORTING

Excel files can be easily exported from JMP using JMP's Excel Wizard. It runs under Microsoft Windows.

SAS files are also easy to export from JMP. Just select SAVE under the FILE menu (or from the JMP Starter window) and make proper settings. Rows and columns will come in the same into the SAS table as they stand in the JMP table.

JMP table-files are likewise easily exported and saved from SAS tables.

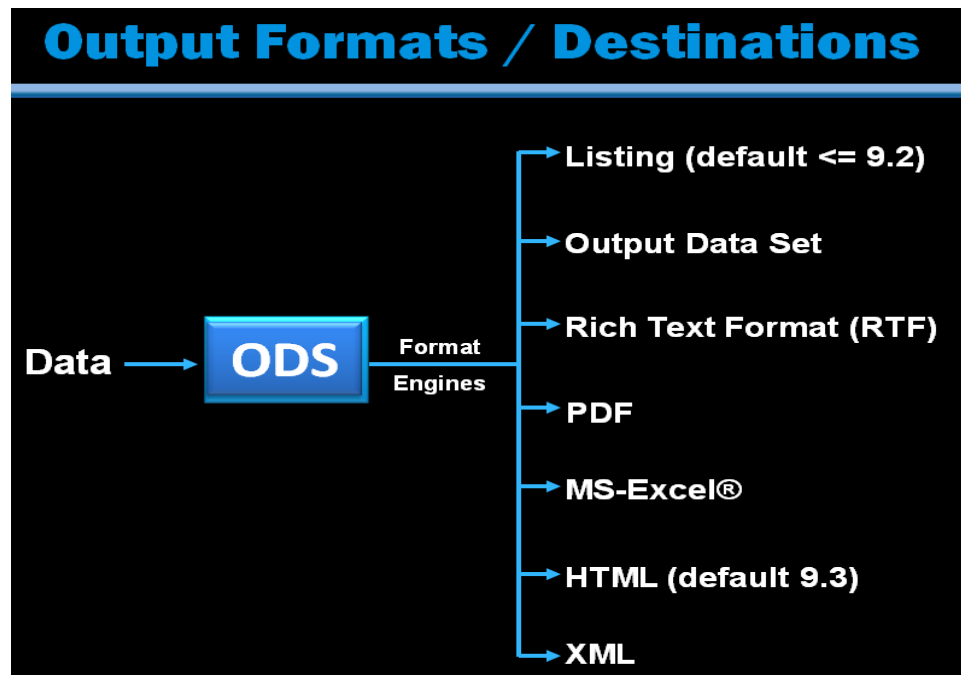


Figure 4. Output Formats / Destinations for SAS users

Refer to the diagram on second page as we consider export details in order, by the diagram numbers:

### X1. MOVING JMP INFORMATION TO MICROSOFT RTF/WORD REPORTS

For Macintosh users, they can drag across the needed rows and columns to copy to the clipboard, and they paste into a Microsoft Word table. This can include the column headings and explanations. Alternatively, you can find JMP export under the FILE panel and choose Microsoft Word, for the Word version you need.

For further processing, JMP users can move their information to a SAS file; then for PC/Windows users the SAS ODS features allow you to move your reports to a Word file for merging into your final presentations.

### X2. MOVING JMP INFORMATION TO HTML OUTPUT

Similar to Microsoft Word files, PC/Windows users can use SAS ODS features to move information to PowerPoint final presentations.

### X3. EXPORTING JMP INFORMATION TO EXCEL FILES

For Macintosh users, they can drag across the needed rows and columns to copy to the clipboard, and they paste into an Excel table. They then double-click on the column headings and type them in.

For PC/Windows users there is a JMP option to export a file using EXPORT under FILE and by selecting Excel Workbook, the JMP output will allow the proper options to be chosen, (\*.xlsx or \*.xls).

#### X4. EXPORTING JMP INFORMATION TO PDF OUTPUT

Under FILE select EXPORT for these optional file formats: Text Export File (\*.txt); CSV (Comma delimited) (\*.csv); TSV (Tab delimited) (\*.tsv); SAS Transport File (\*.xpt); and dBASE Files (\*.dbf, \*.ndx, \*.mdx).

#### EXPORTING FROM SAS TO JMP

SAS can easily export data and/or output to JMP. The steps using the SAS Wizard are illustrated in Figures 5 through 12, below.

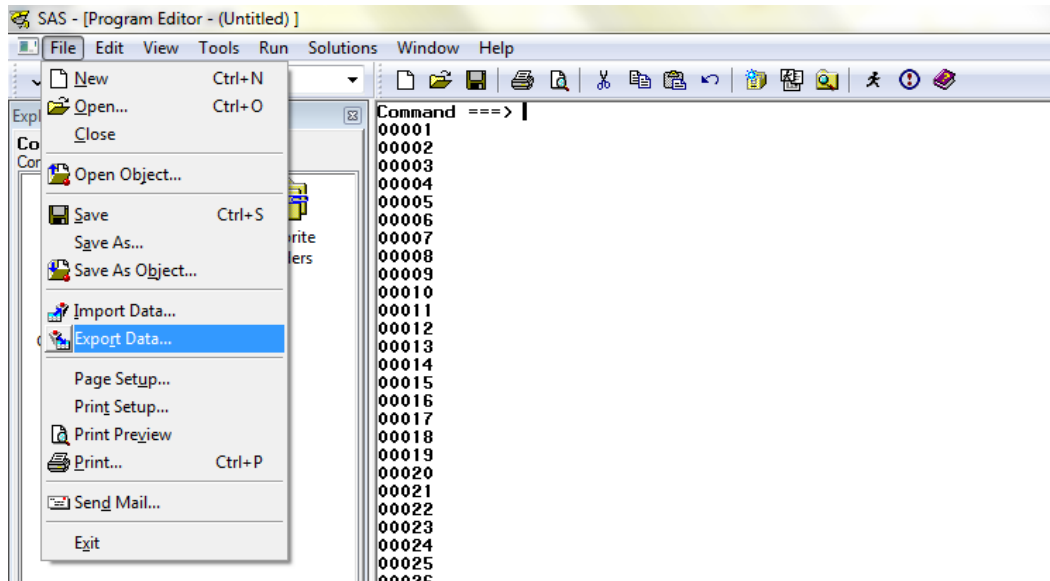


Figure 5. The Export Data Wizard in SAS

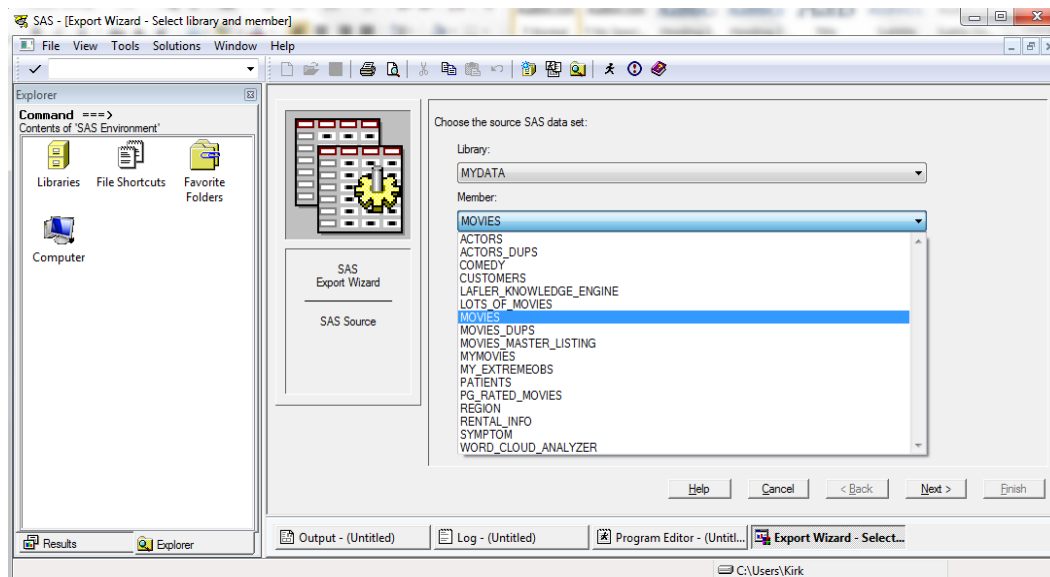
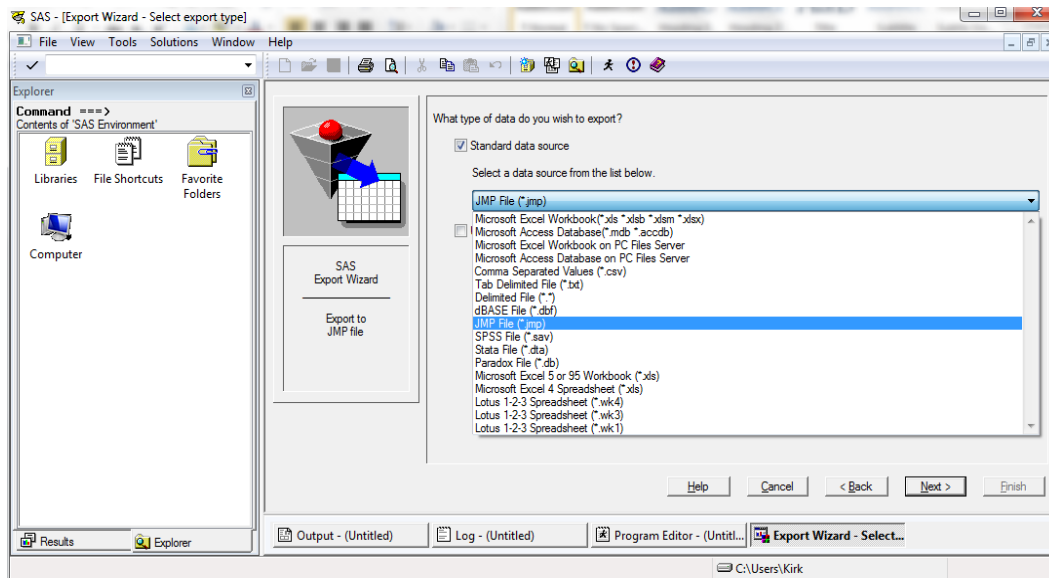
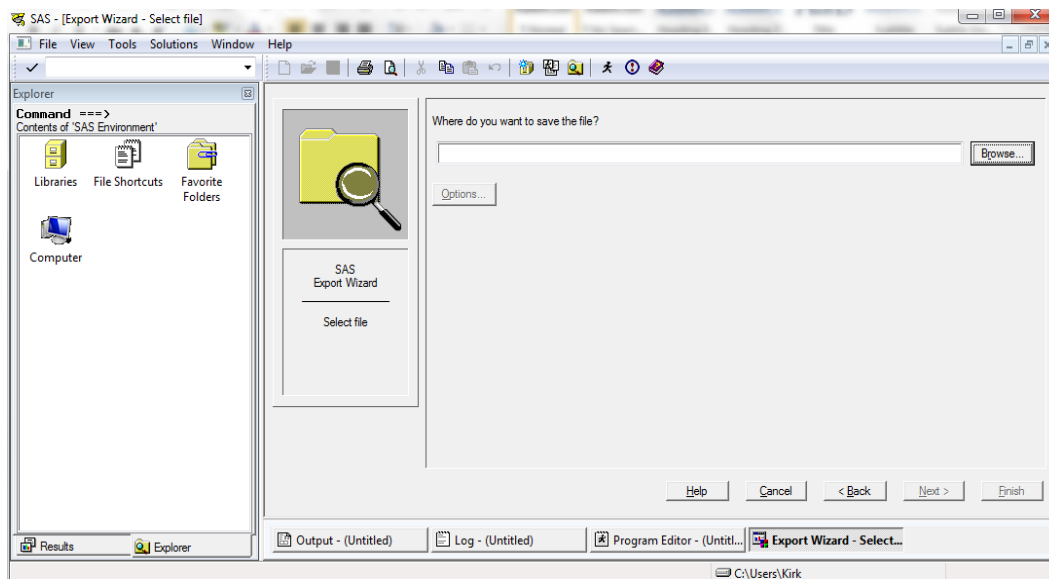


Figure 6. Specify the Data / Output to Export to JMP



**Figure 7. Select the Type of Data (JMP) to Export**



**Figure 8. Specify where to Save JMP Export File**

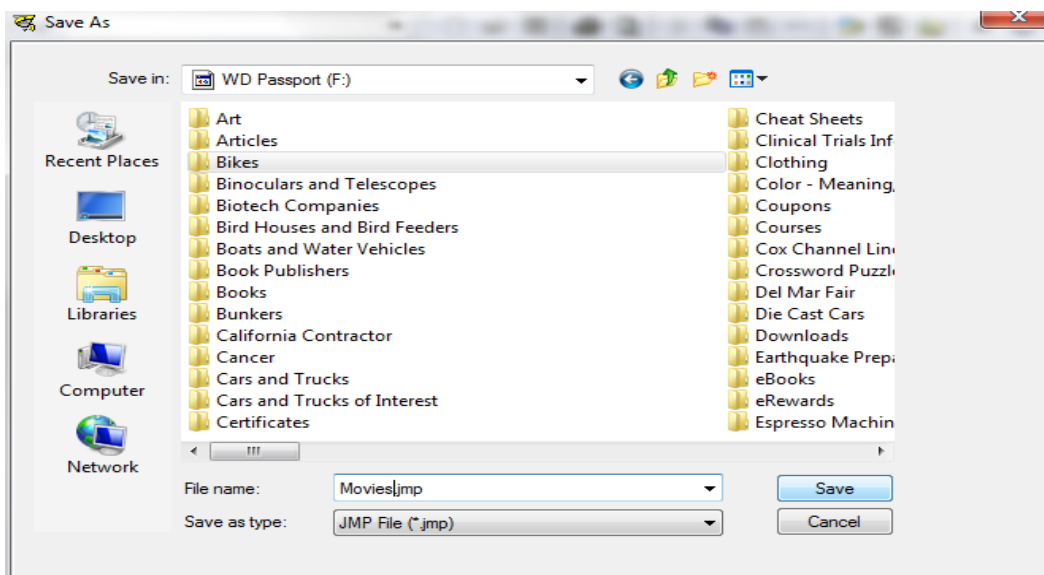


Figure 9. Save the JMP Export File as Movies.jmp

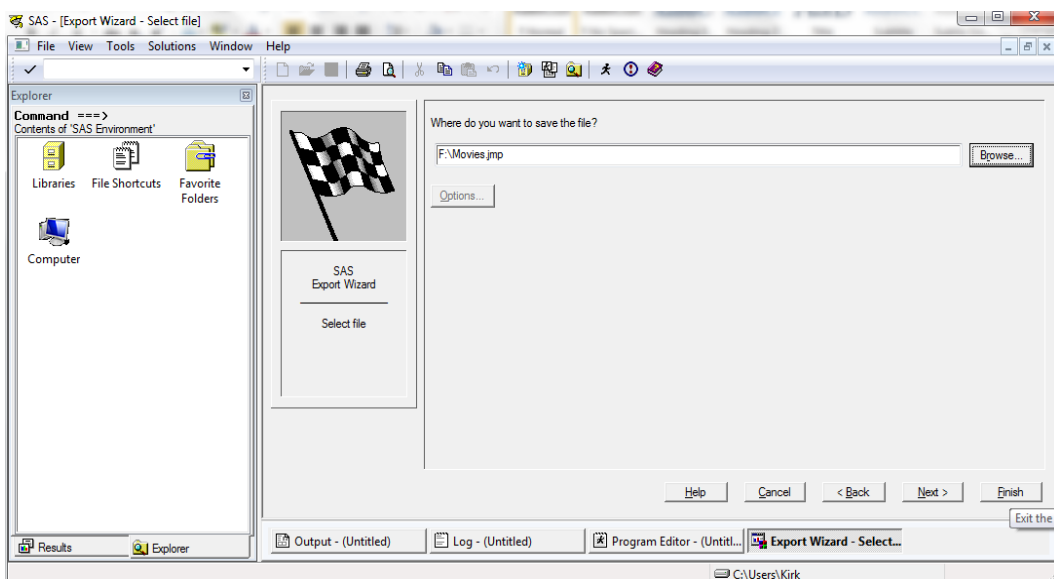


Figure 10. Click the “Finish” Button when complete



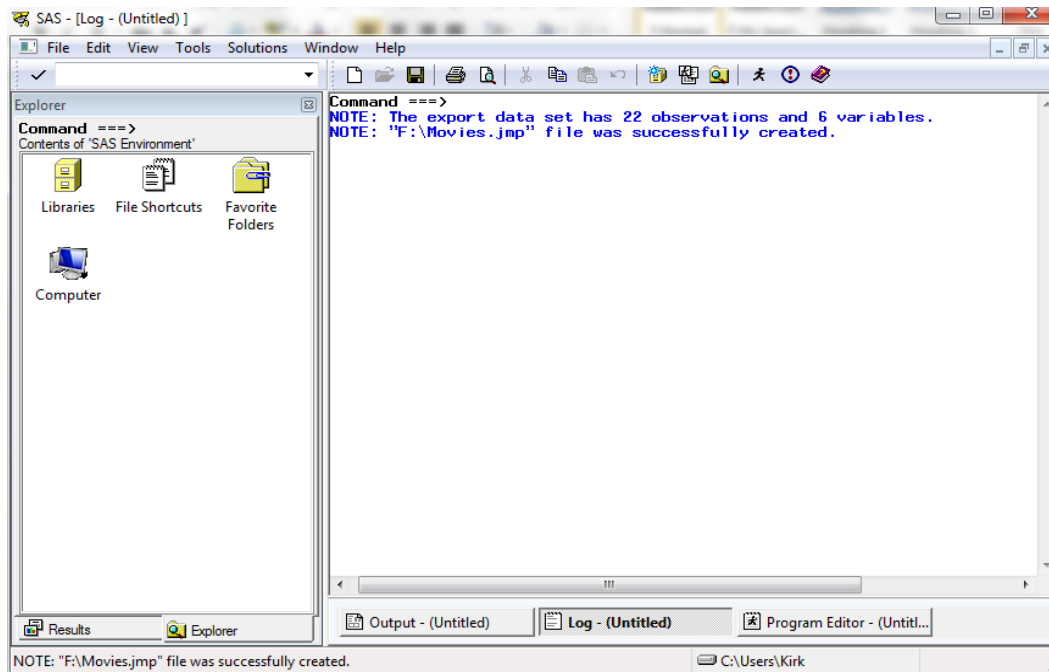


Figure 11. View the SAS Log to verify that the Export was successful

The screenshot shows the JMP software interface with the 'Movies' data table loaded. The table has 22 rows and 6 columns: Title, Length, Category, Year, Studio, and Rating. The left sidebar shows the 'Columns' list with 'Title', 'Length', 'Category', 'Year', 'Studio', and 'Rating' selected. The 'Rows' list shows 'All rows' selected with a count of 22.

	Title	Length	Category	Year	Studio	Rating
1	Brave Heart	177	Action Adventure	1995	Paramount Pictures	R
2	Casablanca	103	Drama	1942	MGM / UA	PG
3	Christmas Vacation	97	Comedy	1989	Warner Brothers	PG-13
4	Coming to America	116	Comedy	1988	Paramount Pictures	R
5	Dracula	130	Horror	1993	Columbia TriStar	R
6	Dressed to Kill	105	Drama Mysteries	1980	Filmways Pictures	R
7	Forrest Gump	142	Drama	1994	Paramount Pictures	PG-13
8	Ghost	127	Drama Romance	1990	Paramount Pictures	PG-13
9	Jaws	125	Action Adventure	1975	Universal Studios	PG
10	Jurassic Park	127	Action	1993	Universal Pictures	PG-13
11	Lethal Weapon	110	Action Cops & Robber	1987	Warner Brothers	R
12	Michael	106	Drama	1997	Warner Brothers	PG-13
13	National Lampoon's Vacation	98	Comedy	1983	Warner Brothers	PG-13
14	Poltergeist	115	Horror	1982	MGM / UA	PG
15	Rocky	120	Action Adventure	1976	MGM / UA	PG
16	Scarface	170	Action Cops & Robber	1983	Universal Studios	R
17	Silence of the Lambs	118	Drama Suspense	1991	Orion	R
18	Star Wars	124	Action Sci-Fi	1977	Lucas Film Ltd	PG
19	The Hunt for Red October	135	Action Adventure	1989	Paramount Pictures	PG
20	The Terminator	108	Action Sci-Fi	1984	Live Entertainment	R
21	The Wizard of Oz	101	Adventure	1939	MGM / UA	G
22	Titanic	194	Drama Romance	1997	Paramount Pictures	PG-13

Figure 12. View the Movies.jmp File

## EXPORTING FROM SAS TO EXCEL

Under FILE select SAVE and select the Excel file. The Excel Wizard guides you through the necessary steps choosing the proper options to be selected; columns, rows, column titles; and formulas to be used from the SAS table. The steps using the SAS Wizard are illustrated in Figures 13 through 20, below.

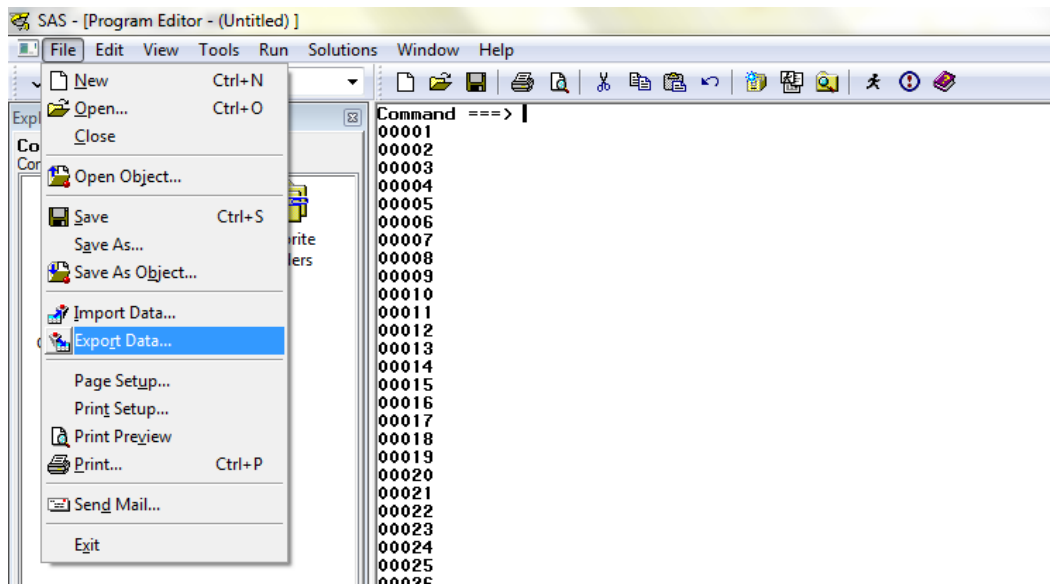


Figure 13. The Export Data Wizard in SAS

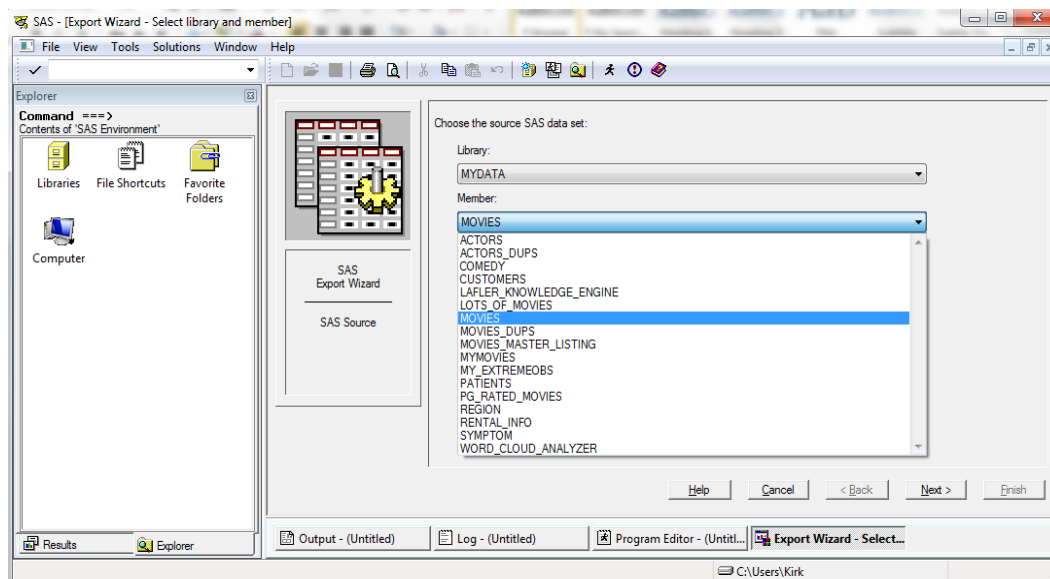
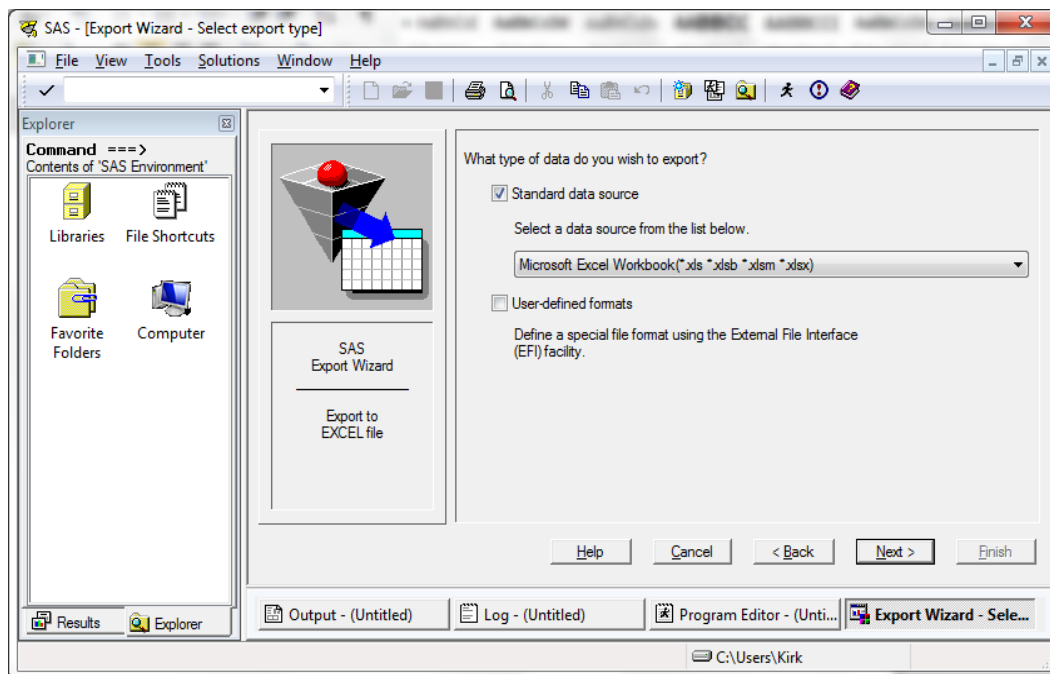
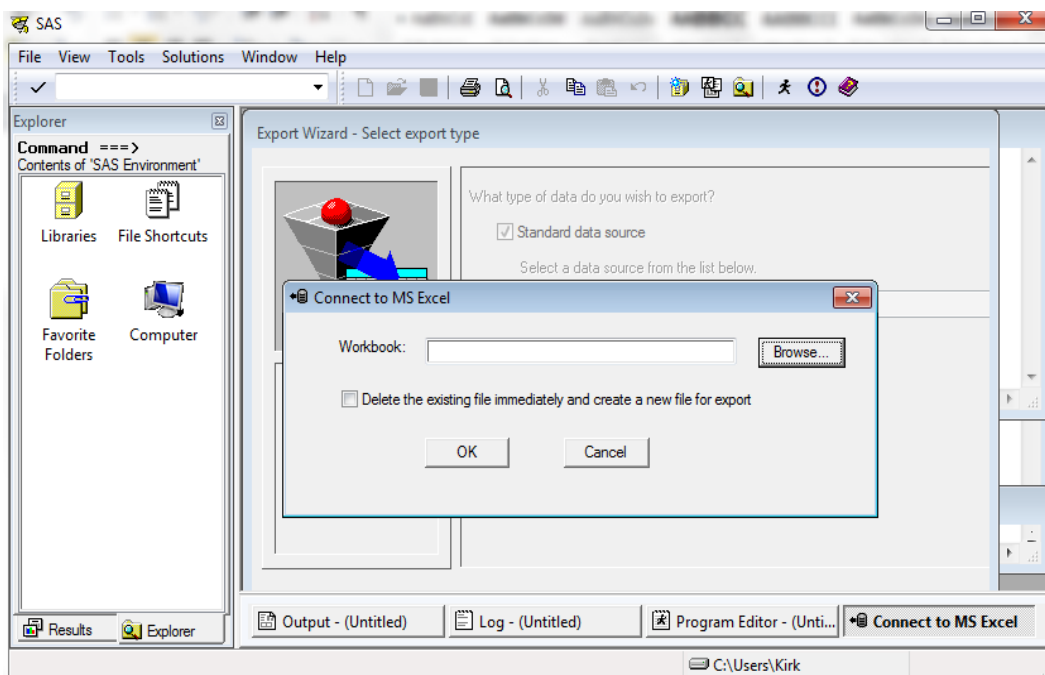


Figure 14. Specify the Data / Output to Export to JMP



**Figure 15. Select the Type of Data (Excel) to Export**



**Figure 16. Click “Browse” to tell SAS where to Save the Excel File**

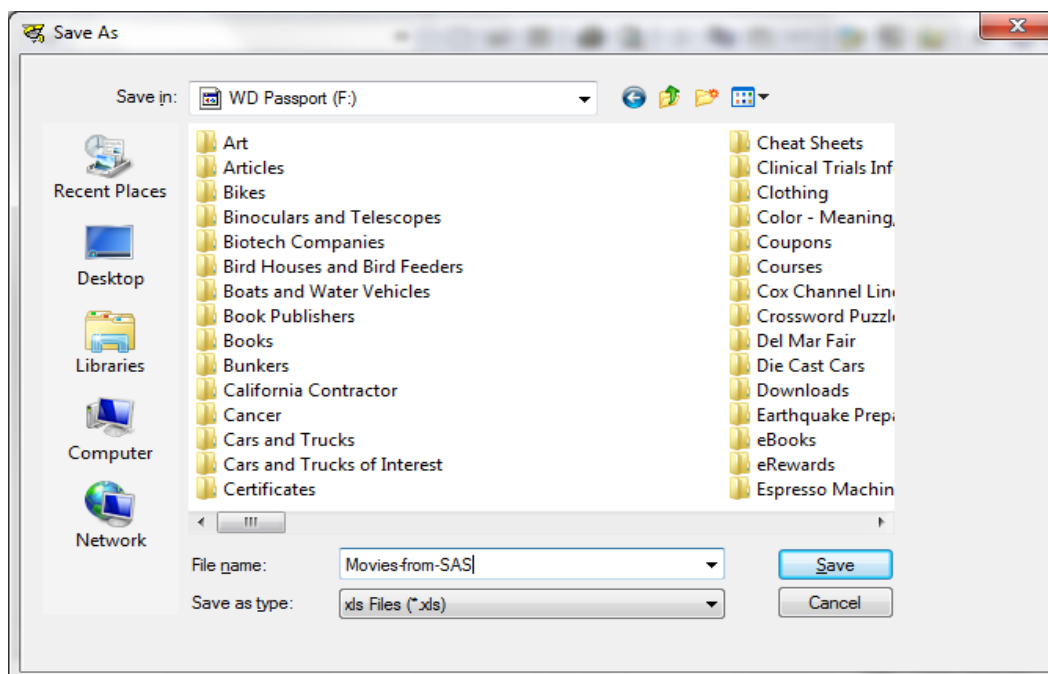


Figure 17. Enter the desired Excel File Name and Click “Save”

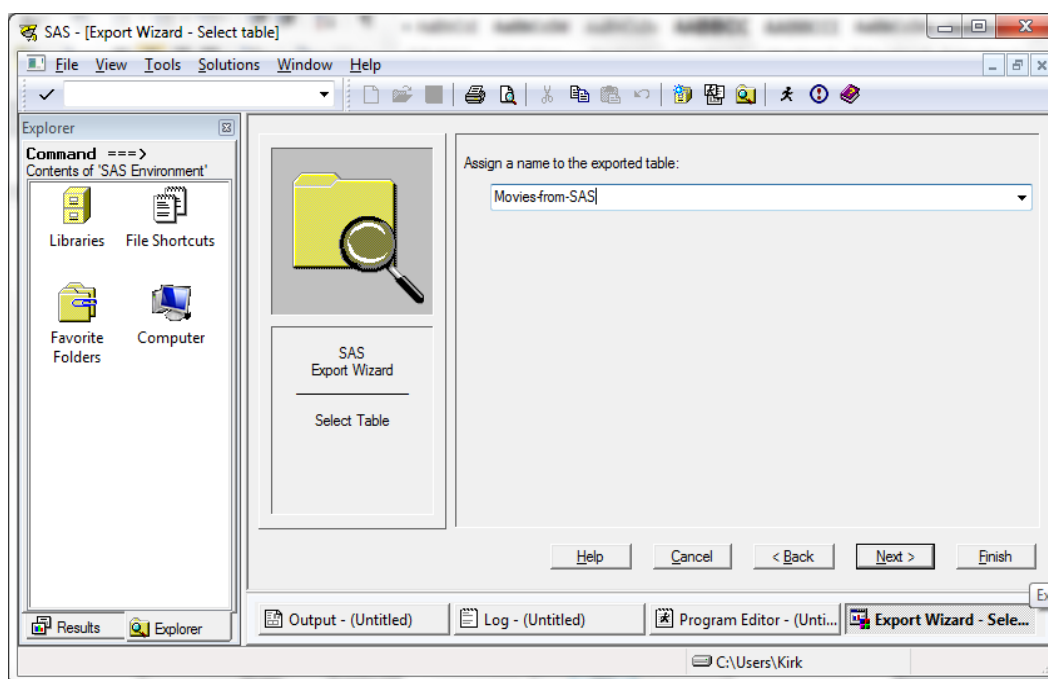


Figure 18. Enter the desired Excel File Name and Click “Next”

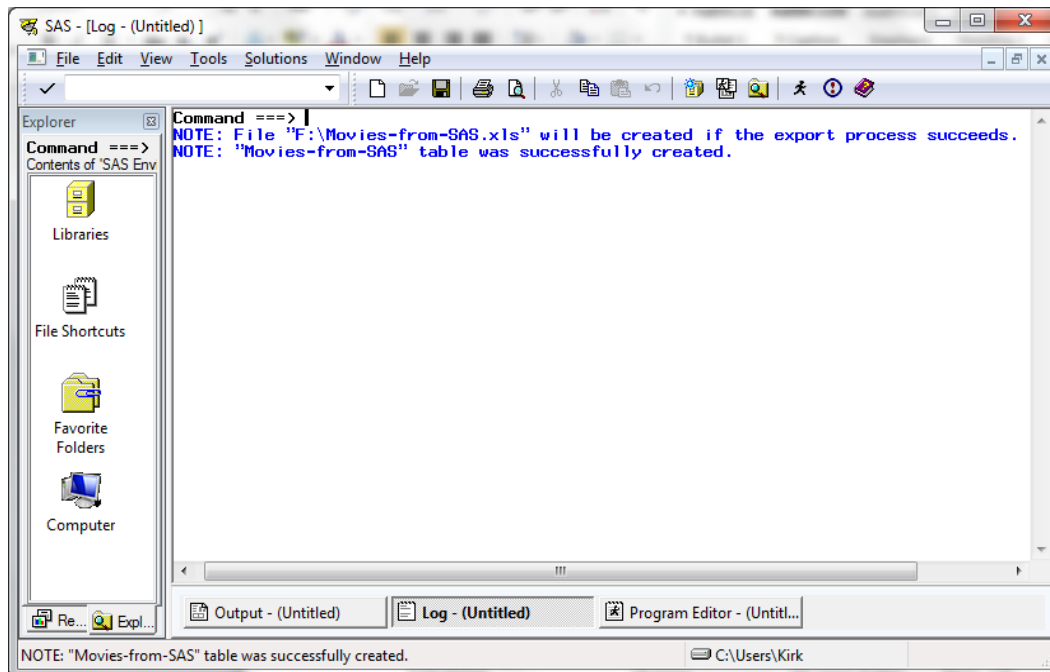


Figure 19. View the SAS Log to verify that the Export was successful

The screenshot shows a Microsoft Excel spreadsheet with the following data:

	A	B	C	D	E	F
2	Brave Heart	177	Action Adventure	1995	Paramount Pictures	R
3	Casablanca	103	Drama	1942	MGM / UA	PG
4	Christmas Vacation	97	Comedy	1989	Warner Brothers	PG-13
5	Coming to America	116	Comedy	1988	Paramount Pictures	R
6	Dracula	130	Horror	1993	Columbia TriStar	R
7	Dressed to Kill	105	Drama Mysteries	1980	Filmways Pictures	R
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21	The Terminator	108	Action Sci-Fi	1984	Live Entertainment	R
22	The Wizard of Oz	101	Adventure	1939	MGM / UA	G
23	Titanic	194	Drama Romance	1997	Paramount Pictures	PG-13

Figure 20. View the Movies.xls File

## SUMMARY AND CONCLUSION

We have shown the ease with which modern JMP and SAS software moves files, importing and exporting. The Excel Wizard helps with prompts to obtain desired transfer. Since JMP is a product of SAS Institute, swift and effective transfer is not unexpected.

The accompanying PowerPoint presentation for this paper moves an Excel file into JMP for visualization and analytics such as, design of experiments and regression, then the information is moved to SAS for further modeling and display, then output by ODS Statistical Graphics to compare with the JMP output for the initial modeling by JMP.

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Charles Edwin Shipp is a programmer, consultant and author, and has been using the SAS and JMP software since 1980. He is credited in the original JMP manual for his roles in the early days. He has written more than one hundred papers and has been an invited speaker at more than one hundred International, regional, local, and special-interest groups. He is the recipient of 12 "Best" contributed paper and poster awards. Charlie is the co-author of three books including the ever-popular Books by Users (BBU) book, Quick Results with SAS/GRAPH Software. Currently, Charlie is involved as an eBook author, App developer for Apple iPad, sasCommunity.org Advisory Board member.

Kirk Paul Lafler is consultant and founder of Software Intelligence Corporation and has been using SAS since 1979. He is a SAS Certified Professional, provider of IT consulting services, trainer to SAS users around the world, and sasCommunity.org emeritus Advisory Board member. As the author of five books including PROC SQL: Beyond the Basics Using SAS, Second Edition (SAS Press 2013); PROC SQL: Beyond the Basics Using SAS (SAS Press 2004), Kirk has written more than five hundred papers and articles, been an Invited speaker and trainer at four hundred-plus SAS International, regional, special-interest, local, and in-house user group conferences and meetings, and is the recipient of 22 "Best" contributed paper, hands-on workshop (HOW), and poster awards.

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