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Using SAS® Enterprise Guide® to Coax Your Excel Data In To SAS®

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ABSTRACT

Importing Microsoft Excel files into SAS can often be a challenge. Perfectly formatted Excel files with labels in the first row and idiosyncrasy-free, clean data is not usually the norm. We will show how to overcome many of the obstacles associated with creating SAS data sets from Excel workbooks by using various combinations of SAS Enterprise Guide 4.3's features. The import wizard, generated code, code suggestion mechanism, options, and the ability to preview the first section of a CSV file will all be shown as mechanisms for creating analytic data sets from Excel input.

INTRODUCTION

Analytics professionals rely on working with reliable and clean data sources. Data is often delivered in Excel spreadsheet format. Many times, the spreadsheets were developed for another purpose, and sending the data to be included in an analytic database was not considered in the design or formatting strategy. SAS and SAS Enterprise Guide provide the capabilities to assess and overcome many of the common issues associated with reading Excel spreadsheets into a SAS Dataset.

In this discussion, we will look at two common issues that arise and examine how Enterprise Guide can be used to properly import your data to SAS.

DATA USED IN EXAMPLES

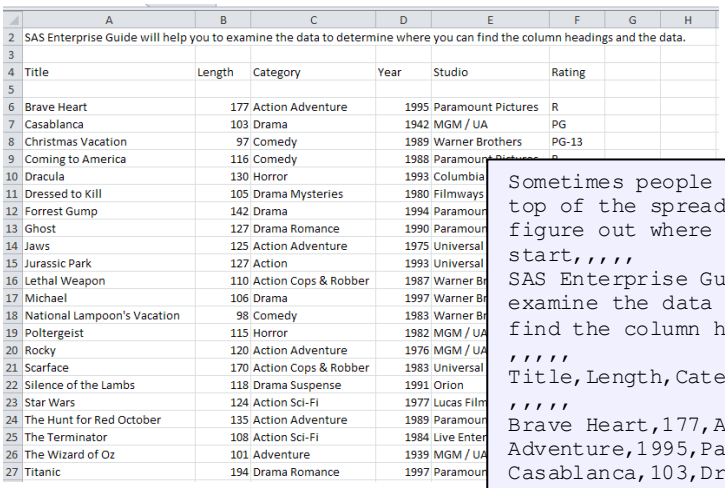
The data used in all the examples in this paper consist of *a* selection of movie classics. The Movies CSV file and Microsoft Excel file consist of six columns: title, length, category, year, studio, and rating. In addition there are versions of these files that include an extra row at the beginning and character data in what is intended to be a numeric field. Illustrations of the data follow:

MOVIES Microsoft Excel File and CSV File

	A	B	C	D	E	F
1	Title	Length	Category	Year	Studio	Rating
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
8	Forrest Gump	142	Drama	1994	Paramount Pictures	PG-13
9	Ghost	127	Drama Romance	1990	Paramount Pictures	PG-13
10	Jaws	125	Action Adventure	1975	Universal Studios	PG
11	Jurassic Park	127	Action	1993	Universal Pictures	PG-13
12	Lethal Weapon	110	Action Cops & Robber	1987	Warner Brothers	R
13	Michael	106	Drama	1997	Warner Brothers	PG-13
14	National Lampoon's Vacation	98	Comedy	1983	Warner Brothers	PG-13
15	Poltergeist	115	Horror			
16	Rocky	120	Action Adventure			
17	Scarface	170	Action Cops & Robber			
18	Silence of the Lambs	118	Drama Suspense			
19	Star Wars	124	Action Sci-Fi			
20	The Hunt for Red October	135	Action Adventure			
21	The Terminator	108	Action Sci-Fi			
22	The Wizard of Oz	101	Adventure			
23	Titanic	194	Drama Romance			

```
Title,Length,Category,Year,Studio,Rating
Brave Heart,177,Action
Adventure,1995,Paramount Pictures,R
Casablanca,103,Drama,1942,MGM / UA,PG
Christmas Vacation,97,Comedy,1989,Warner
Brothers.PG-13
```

MOVIES with extra row Microsoft Excel File and CSV File



	A	B	C	D	E	F	G	H
2	SAS Enterprise Guide will help you to examine the data to determine where you can find the column headings and the data.							
3								
4	Title	Length	Category	Year	Studio	Rating		
5								
6	Brave Heart	177	Action Adventure	1995	Paramount Pictures	R		
7	Casablanca	103	Drama	1942	MGM / UA	PG		
8	Christmas Vacation	97	Comedy	1989	Warner Brothers	PG-13		
9	Coming to America	116	Comedy	1988	Paramount Pictures	R		
10	Dracula	130	Horror	1993	Columbia			
11	Dressed to Kill	105	Drama Mysteries	1980	Filmways			
12	Forrest Gump	142	Drama	1994	Paramoun			
13	Ghost	127	Drama Romance	1990	Paramoun			
14	Jaws	125	Action Adventure	1975	Universal			
15	Jurassic Park	127	Action	1993	Universal			
16	Lethal Weapon	110	Action Cops & Robber	1987	Warner Br			
17	Michael	106	Drama	1997	Warner Br			
18	National Lampoon's Vacation	98	Comedy	1983	Warner Br			
19	Poltergeist	115	Horror	1982	MGM / UA			
20	Rocky	120	Action Adventure	1976	MGM / UA			
21	Scarface	170	Action Cops & Robber	1983	Universal			
22	Silence of the Lambs	118	Drama Suspense	1991	Orion			
23	Star Wars	124	Action Sci-Fi	1977	Lucas Film			
24	The Hunt for Red October	135	Action Adventure	1989	Paramoun			
25	The Terminator	108	Action Sci-Fi	1984	Live Enter			
26	The Wizard of Oz	101	Adventure	1939	MGM / UA			
27	Titanic	194	Drama Romance	1997	Paramoun			

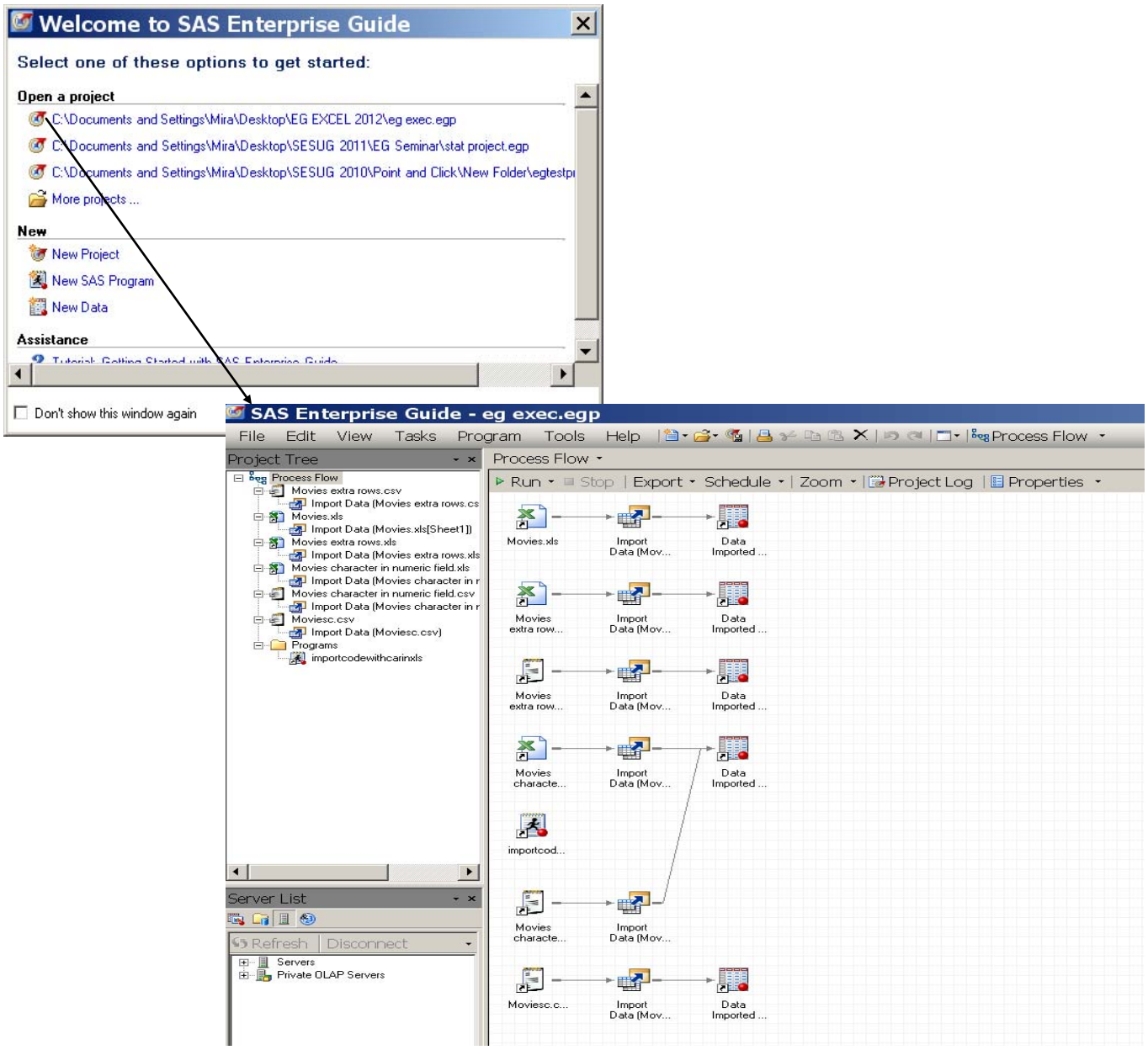
```
Sometimes people add some comments at the
top of the spreadsheet and you need to
figure out where your titles and data
start,,,,,
SAS Enterprise Guide will help you to
examine the data to determine where you can
find the column headings and the data.,,,,,
,,,,,
Title,Length,Category,Year,Studio,Rating
,,,,,
Brave Heart,177,Action
Adventure,1995,Paramount Pictures,R
Casablanca,103,Drama,1942,MGM / UA,PG
Christmas Vacation,97,Comedy,1989,Warner
Brothers,PG-13
```

MOVIES character in numeric field Microsoft Excel File

	A	B	C	D	E	F
1	Title	Length	Category	Year	Studio	Rating
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
8	Forrest Gump	142	Drama	1994	Paramount Pictures	PG-13
9	Ghost	127	Drama Romance	1990	Paramount Pictures	PG-13
10	Jaws	125	Action Adventure	1975	Universal Studios	PG
11	Jurassic Park	127	Action	1993	Universal Pictures	PG-13
12	Lethal Weapon	x23	Action Cops & Robber	1987	Warner Brothers	R
13	Michael	106	Drama	1997	Warner Brothers	PG-13
14	National Lampoon's Vacation	98	Comedy	1983	Warner Brothers	PG-13
15	Poltergeist	115	Horror	1982	MGM / UA	PG
16	Rocky	120	Action Adventure	1976	MGM / UA	PG
17	Scarface	170	Action Cops & Robber	1983	Universal Studios	R
18	Silence of the Lambs	118	Drama Suspense	1991	Orion	R
19	Star Wars	124	Action Sci-Fi	1977	Lucas Film Ltd	PG
20	The Hunt for Red October	135	Action Adventure	1989	Paramount Pictures	PG
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

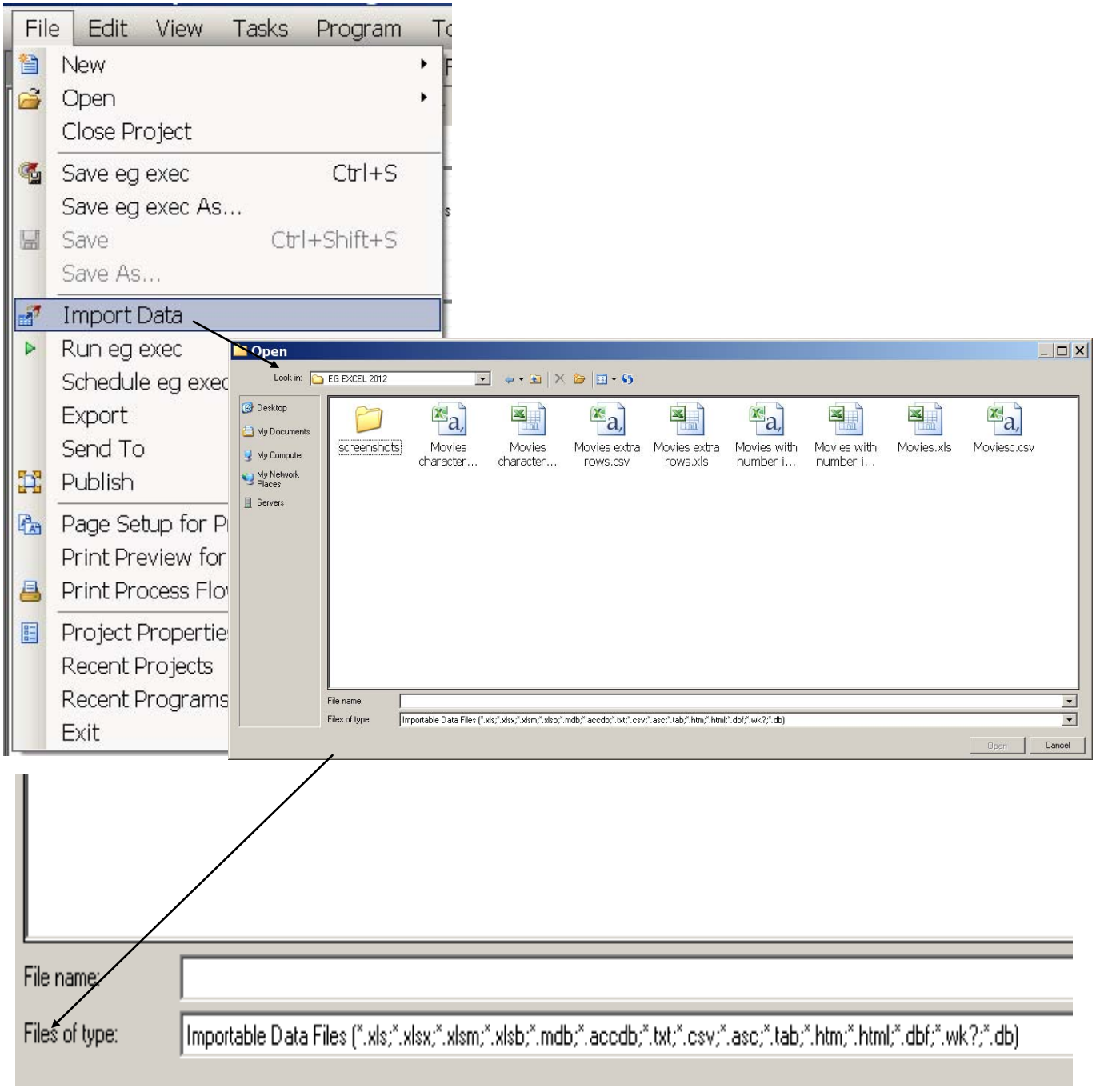
OPENING ENTERPRISE GUIDE AND YOUR PROJECT

In order to begin, you need to open Enterprise Guide. When the "Welcome to SAS Enterprise Guide" window appears, you can choose to create a new project or select an existing project. Here we are choosing an existing project.



IMPORTING YOUR DATA

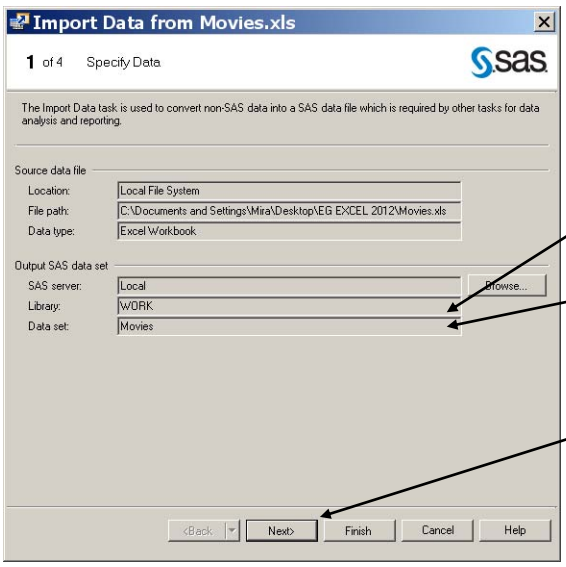
In order to import your data, choose ***File*** and then ***Import Data*** from the tool bar. Then use the ***Open*** dialog box to navigate to the file of interest. Note that there is a list of importable file types in the ***Files of type:*** section of the ***Open*** dialog box. These file types multiple Excel, text and database types.



IMPORTING A "PERFECTLY FORMATTED" EXCEL SPREADSHEET

Once you have navigated to the file of interest and clicked ***Open***, the Enterprise Guide ***Import Data*** wizard will guide you through the import process. The first step allows you to verify the data input source and choose your output source. Note that unless you change the destination library, that the resulting SAS data set is placed in the work library and is temporary and will not be saved after closing Enterprise Guide. You may change the Output destination to another permanent SAS library. If you choose to have the resulting data set reside only in a temporary library, it will be recreated the next time you run the program in the saved Enterprise Guide Project.

Step 1 of the Import Process



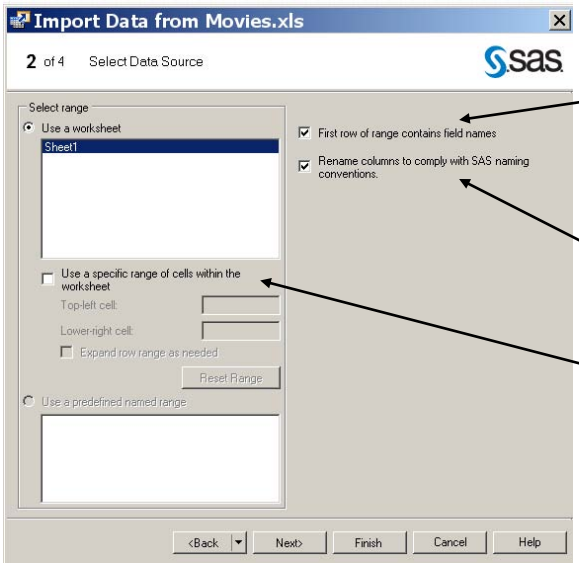
Specify the output library

The data set name defaults to the name of the incoming data set.

Click ***Next*** to continue to use the wizard to apply options to the import process or click ***Finish*** to complete the import.

Step 2 of the Import Process

Step2 of the ***Import Data*** process provides multiple options for manipulating the incoming Excel spreadsheet. You may indicate whether the first row contains field names, and you may choose to rename the columns to comply with SAS naming conventions. If the incoming field names include spaces, it is recommended that you chose ***Rename the columns to comply with SAS naming conventions*** so that they can be directly used in SAS programming statements. In this step you may also choose to import only a section of the spreadsheet, either by name or by cell ranges.



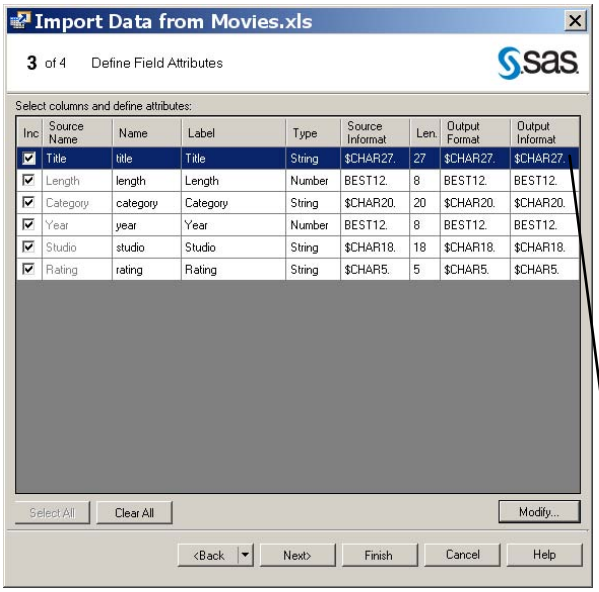
Check to use the first row of the spreadsheet for variable names.

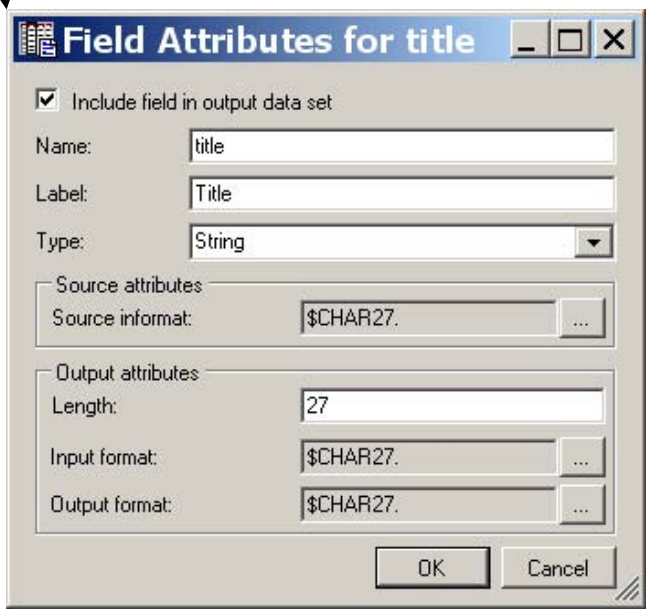
Rename the columns using SAS naming conventions. Important: if your column names have imbedded blanks. This facilitates SAS programming

This section gives the capability to select a range of cells either by name or by cell range specification.

Step 3 of the Import Process

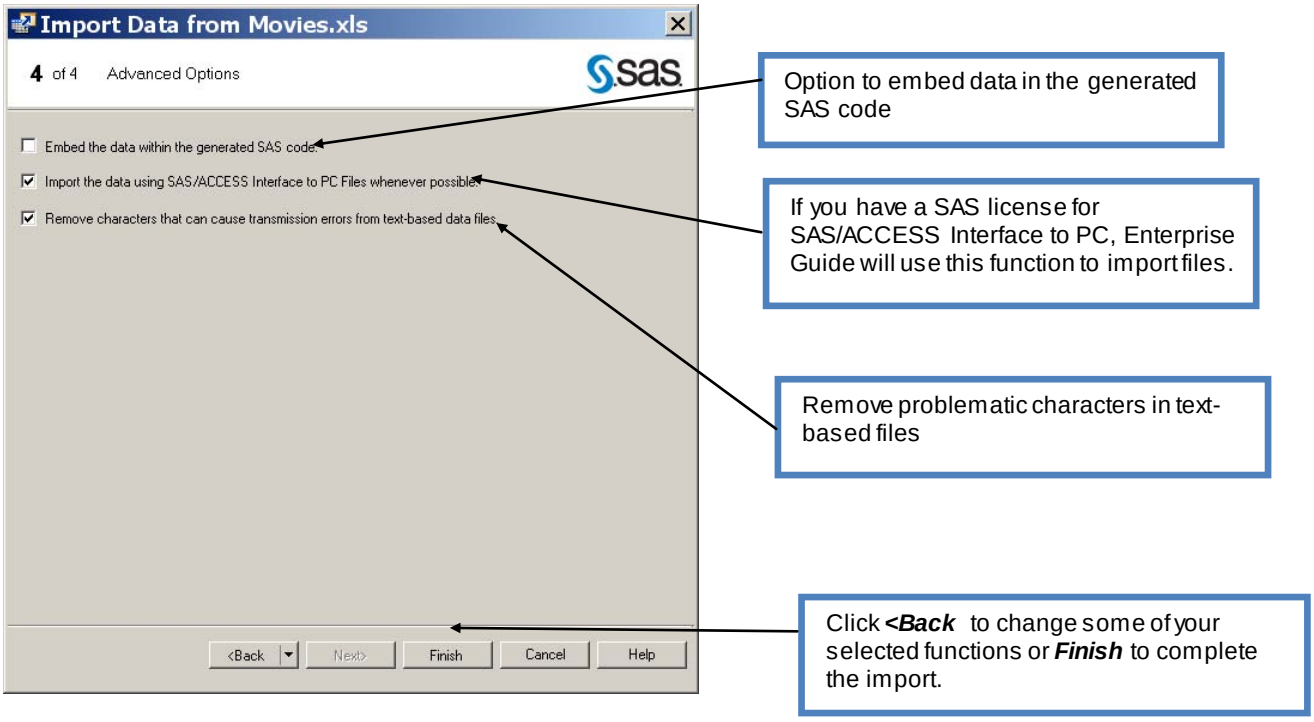
Step 3 of the ***Import Data*** process allows the user to examine and change attributes. Modifications can be made to the Name, Label, Type and Informats and Formats. Since in this example we are working with our "perfectly formatted" spreadsheet, we will not make any changes.





Step 4 of the Import Process

Step 4 of the ***Import Data*** process provides three important options. The first enables embedding the data in the generated SAS code. It is entirely up to the user whether they will find this useful. Secondly, if your SAS license includes SAS/ACCESS Interface to PC Files, Enterprise Guide will use this capability to enhance and speed up the import process. The additional option will allow SAS Enterprise Guide to "clean up" the text files.



The data was correctly imported into SAS Enterprise Guide.

Import Data (Movies.xls[Sheet1])

Code | Log | Output Data

Modify Task | Filter and Sort | Query Builder | Data | Describe | Graph | Ar

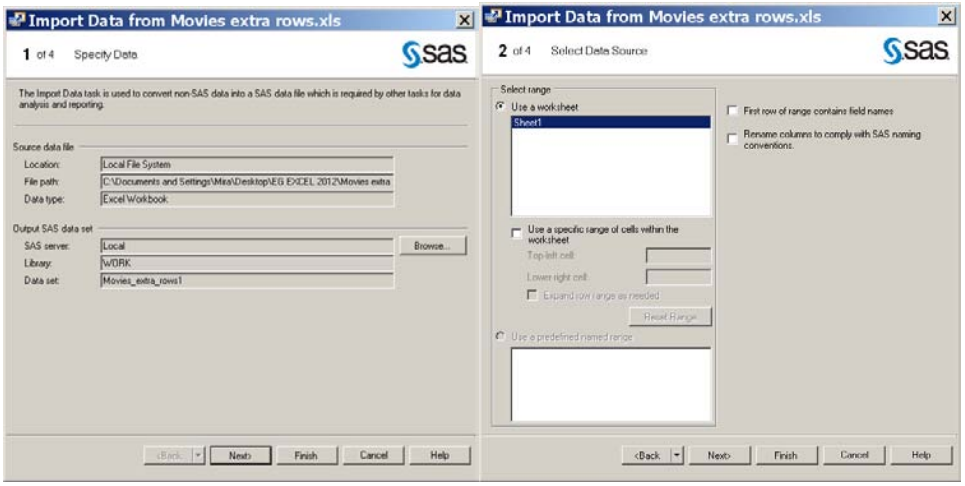
	Title	Length	Category	Year	Studio	Rating
1	Brave Heart	177	Action Adventure	1995	Paramount Pictu...	R
2	Casablanca	103	Drama	1942	MGM / UA	PG
3	Christmas Vacati...	97	Comedy	1989	Warner Brothers	PG-13
4	Coming to Ameri...	116	Comedy	1988	Paramount Pictu...	R
5	Dracula	130	Horror	1993	Columbia TriStar	R
6	Dressed to Kill	105	Drama Mysteries	1980	Filmways Pictures	R
7	Forrest Gump	142	Drama	1994	Paramount Pictu...	PG-13
8	Ghost	127	Drama Romance	1990	Paramount Pictu...	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 &R...	1987	Warner Brothers	R
12	Michael	106	Drama	1997	Warner Brothers	PG-13
13	National Lampoo...	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 &R...	1983	Universal Studios	R
17	Silence of the La...	118	Drama Suspense	1991	Orion	R
18	Star Wars	124	Action Sci-Fi	1977	Lucas Film Ltd	PG
19	The Hunt for Red...	135	Action Adventure	1989	Paramount Pictu...	PG
20	The Terminator	108	Action Sci-Fi	1984	Live Entertainme...	R
21	The Wizard of Oz	101	Adventure	1939	MGM / UA	G
22	Titanic	194	Drama Romance	1997	Paramount Pictu...	PG-13

IMPORTING AN EXCEL SPREADSHEET WITH EXTRA ROWS

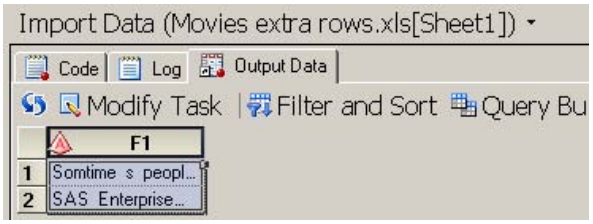
The file, Movies extra row.xls , contains blank lines and some extra lines of text at the top. Unlike the "perfectly formatted" Excel file, we will need to examine the file to understand the best way to import the data into SAS. With a small amount of pre-processing, the Enterprise Guide ***Import Data*** wizard guides the user through the process without the need for programming.

What doesn't work and Why Not!

For a first try we navigate to the Excel spreadsheet with the extra rows. Since we know the first row doesn't have field names, we leave that box unchecked and click the ***Finish*** button and examine the results.



The result of this process is the following SAS data set ,which is clearly not what is expected or a correct representation of the Movies data set.



In order to understand what happened, we will take a look at the code that SAS Enterprise Guide created. It is clear from examining the code, even for someone who is not an experienced programmer, that somehow the text in the file, was interpreted as data and we did not properly import our Movies data set.

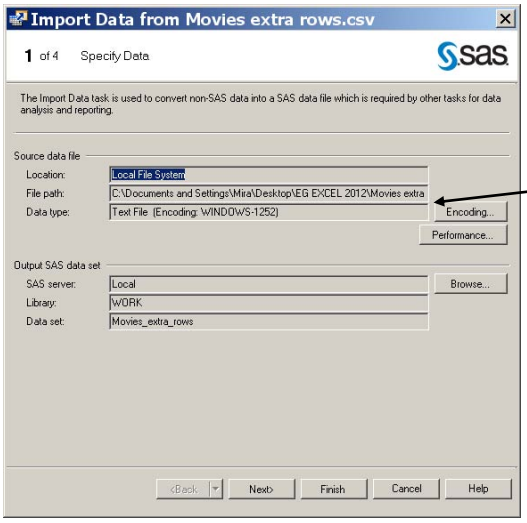
```
DATA WORK.Movies_extra_rows1;
    LENGTH
        F1                $ 124 ;
    FORMAT
        F1                $CHAR124. ;
    INFORMAT
        F1                $CHAR124. ;
    INFILE 'C:\Documents and Settings\Mira\Local
Settings\Temp\SEG4020\Movies extra rows-
e6b3a708621943489f6c343395b6c302.txt'
        LRECL=124
        ENCODING="WLATIN1"
        TERMSTR=CRLF
        DLM='7F'x
        MISSOVER
        DSD ;
    INPUT
```

THIS CODE DOES NOT ACHIEVE THE DESIRED RESULTS!

The text at the top of the file is seen as the only variable "F1" and is determined to be character and 124 characters in length.

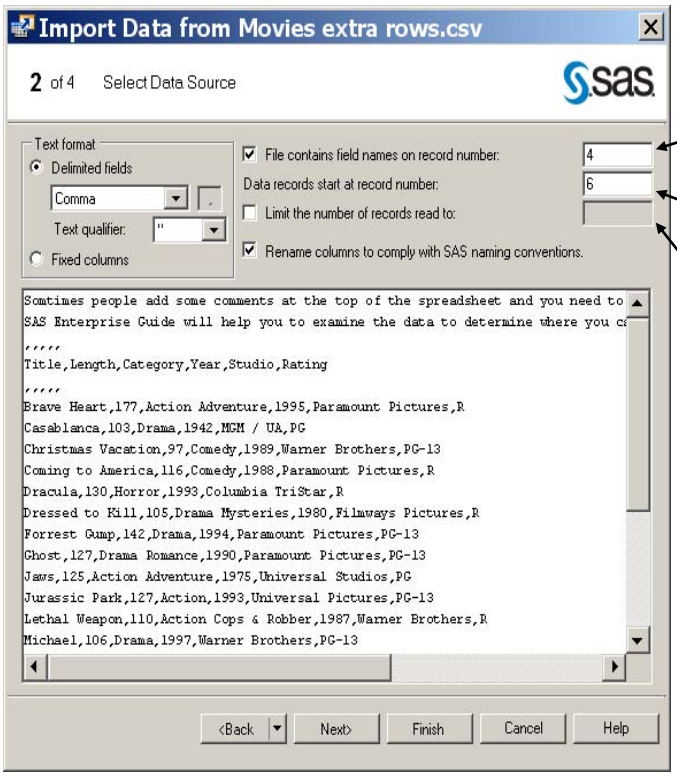
What WORKS to import the Movies Data Set with extra rows, and Why!

Movies extra row.xls was opened in Excel and saved as a comma separated value (CSV) file, resulting in the file illustrated above in the Data Used section. Now we will go back to the FILE->IMPORT and point to the Movies extra row.csv data set and proceed.



Point to the CSV version of the movies data set.

After clicking the ***Next*** button the ***Import Data*** wizard displays a sample of the file and provides options for directing how the data is imported. Looking at the display we can see that the field names appear in line 4 and the data begins in line 6, so we fill in these values in the associated boxes. In this case we won't limit the number of records read, but that is an option in this dialog.



Row in the CSV file where the field names are located.

Row in the CSV file where the data begins

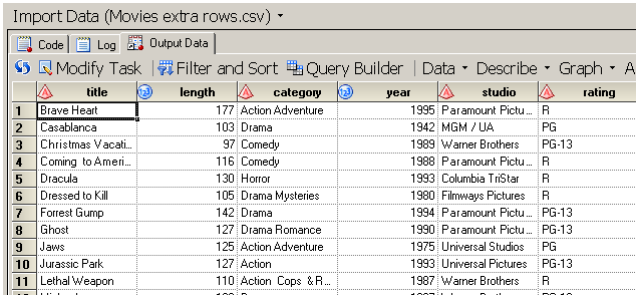
Option to limit the number of rows read

Code created by Enterprise Guide to import the Movies extra rows.csv file.

```
DATA WORK.Movies_extra_rows;
    LENGTH
        title            $ 27
        length             8
        category         $ 20
        year               8
        studio           $ 18
        rating           $ 5 ;
    LABEL
        title            = "Title"
        length           = "Length"
        category         = "Category"
        year             = "Year"
        studio           = "Studio"
        rating           = "Rating" ;
    FORMAT
        title            $CHAR27.
        length           BEST3.
        category         $CHAR20.
        year             BEST4.
        studio           $CHAR18.
        rating           $CHAR5. ;
    INFORMAT
        title            $CHAR27.
        length           BEST3.
        category         $CHAR20.
        year             BEST4.
        studio           $CHAR18.
        rating           $CHAR5. ;
    INFILE
'C:\Documents and Settings\Mira\Local Settings\Temp\
SEG3080\Movies extra rows-fe04b331a3b748219dc38d9689d2da57.txt'
        LRECL=72
        ENCODING="WLATIN1"
        TERMSTR=CRLF
        DLM='7F'x
        MISSOVER
        DSD ;
    INPUT
        title            : $CHAR27.
        length           : ?? BEST3.
        category         : $CHAR20.
        year             : ?? BEST4.
        studio           : $CHAR18.
        rating           : $CHAR5. ;
RUN;
```

Our Resulting Correct Data Set!

This time, using the CSV file and pointing to the correct lines for the column headings and data, we have properly imported our Movies data set, avoiding the blank lines and extra text.


Import Data (Movies extra rows.csv)

Code | Log | Output Data

Modify Task | Filter and Sort | Query Builder | Data | Describe | Graph | A

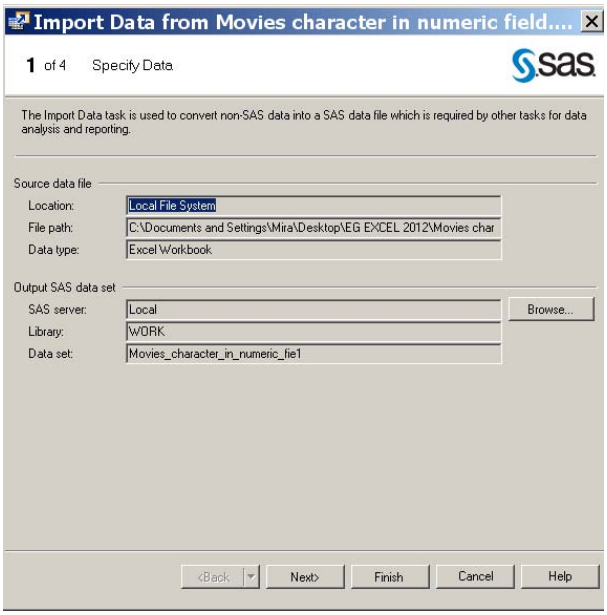
	title	length	category	year	studio	rating
1	Brave Heart	177	Action Adventure	1995	Paramount Pictu...	R
2	Casablanca	103	Drama	1942	MGM / UA	PG
3	Christmas Vacati...	97	Comedy	1989	Warner Brothers	PG-13
4	Coming to Ameri...	116	Comedy	1988	Paramount Pictu...	R
5	Dracula	130	Horror	1993	Columbia TriStar	R
6	Dressed to Kill	105	Drama Mysteries	1980	Filmways Pictures	R
7	Forrest Gump	142	Drama	1994	Paramount Pictu...	PG-13
8	Ghost	127	Drama Romance	1990	Paramount Pictu...	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 &R...	1987	Warner Brothers	R

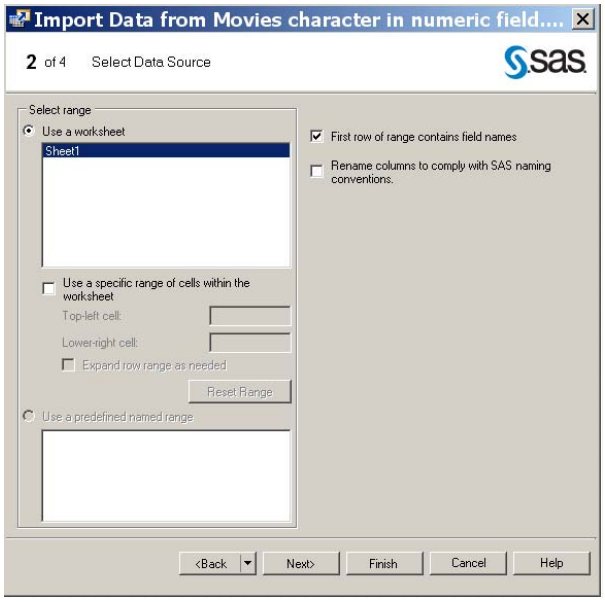
IMPORTING AN EXCEL SPREADSHEET WITH A CHARACTER IN A NUMERIC FIELD

More often than not, we are presented with spreadsheets that contain incorrect characters in a numeric field. The good news is that these kinds of errors are easy to spot. The bad news is that the field then gets converted to character rather than numeric upon import. Once the error is spotted there are multiple options to address this problem. In this example, it is assumed that we want to encode the value as missing and maintain the numeric format in the column.

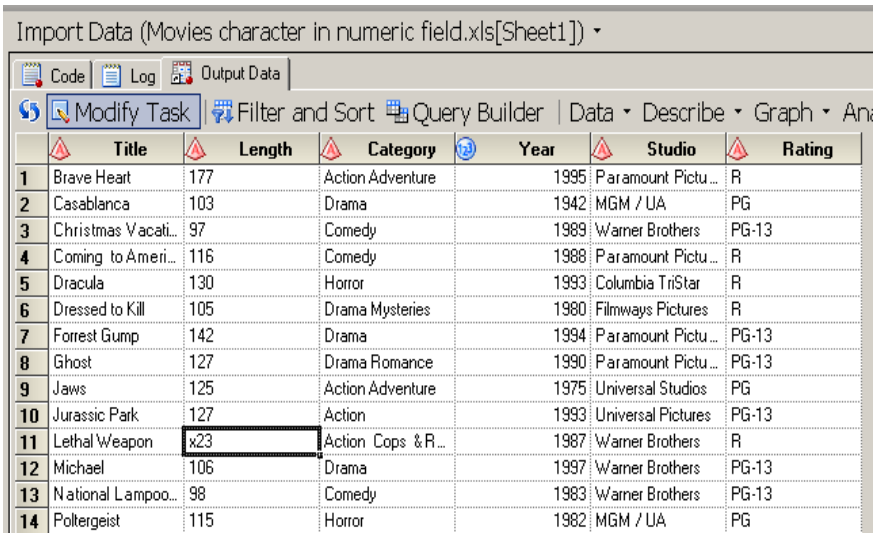
Enterprise Guide Makes This Easy!

We begin the import process as in the previous two examples.



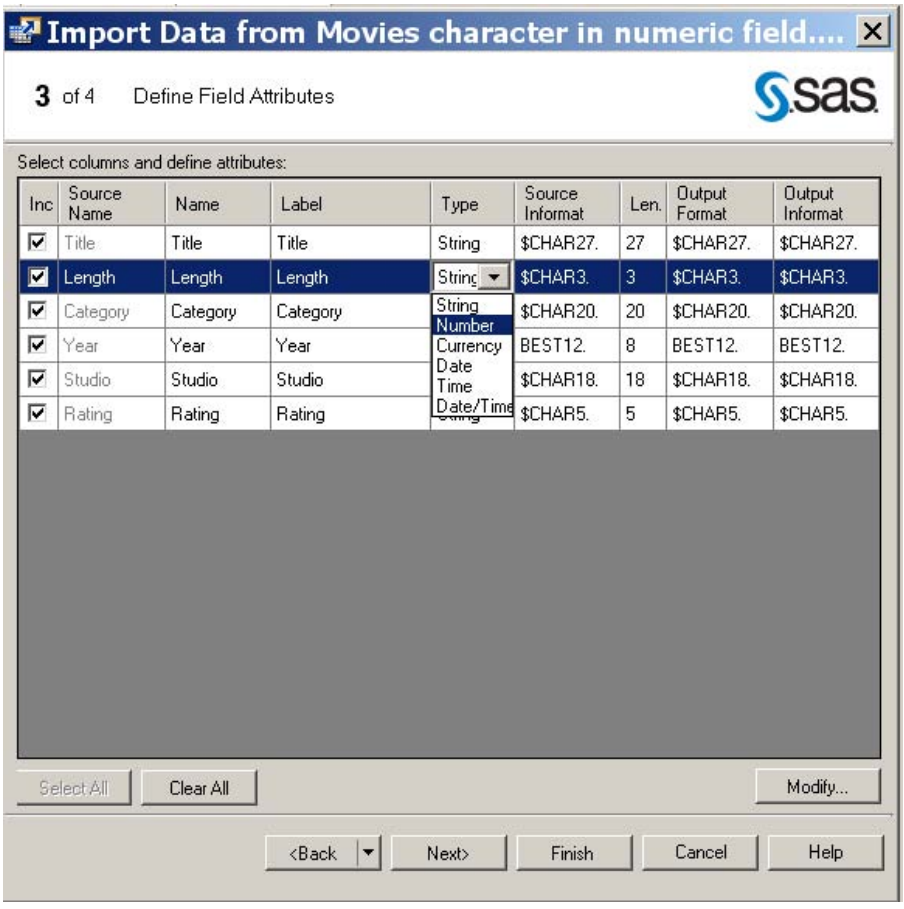


If we had clicked **the *Finish*** button after selecting the data source, we would have obtained the result below. Notice that the length in line 11 contains an "x", which results in the ***Length*** field being defined as character. Rather than trying to manipulate the data after the import to correct this problem, we will attempt to correct it during the import by either continuing on to step 3 or, if we had already imported the data, by modifying the ***Import Task.***

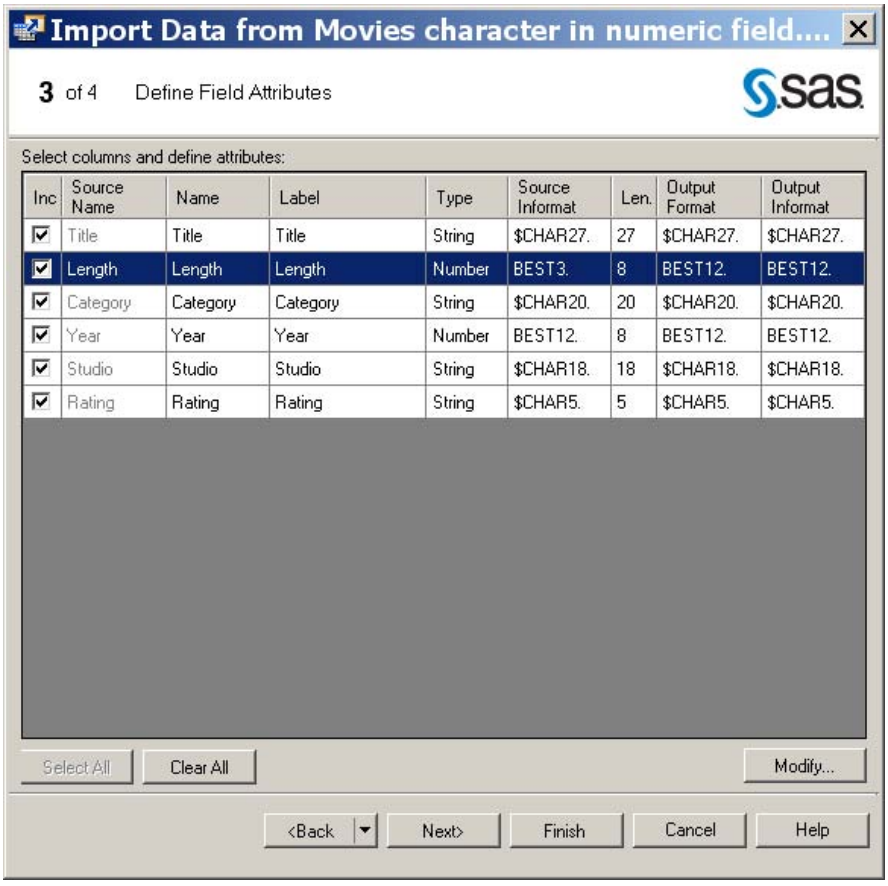


	Title	Length	Category	Year	Studio	Rating
1	Brave Heart	177	Action Adventure	1995	Paramount Pictu...	R
2	Casablanca	103	Drama	1942	MGM / UA	PG
3	Christmas Vacati...	97	Comedy	1989	Warner Brothers	PG-13
4	Coming to Ameri...	116	Comedy	1988	Paramount Pictu...	R
5	Dracula	130	Horror	1993	Columbia TriStar	R
6	Dressed to Kill	105	Drama Mysteries	1980	Filmways Pictures	R
7	Forrest Gump	142	Drama	1994	Paramount Pictu...	PG-13
8	Ghost	127	Drama Romance	1990	Paramount Pictu...	PG-13
9	Jaws	125	Action Adventure	1975	Universal Studios	PG
10	Jurassic Park	127	Action	1993	Universal Pictures	PG-13
11	Lethal Weapon	x23	Action Cops & R...	1987	Warner Brothers	R
12	Michael	106	Drama	1997	Warner Brothers	PG-13
13	National Lampoo...	98	Comedy	1983	Warner Brothers	PG-13
14	Poltergeist	115	Horror	1982	MGM / UA	PG

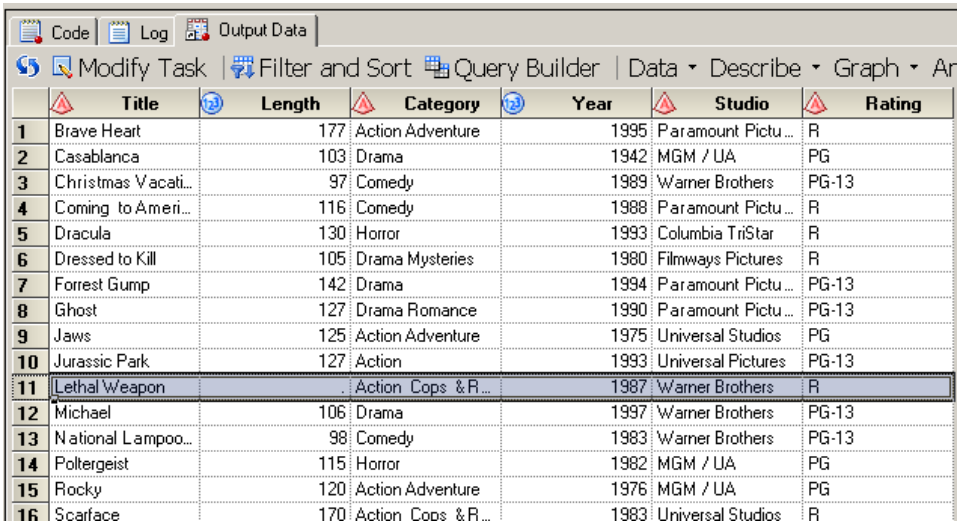
On step 3 of the ***Import Task*** the user is given the opportunity to view and/or modify the ***Field Attributes.*** As a result of the "x" in the ***Length*** column on line 11, the Type for ***Length*** is "string". Ideally we would like this column to be "numeric" and the value in the field to be coded as missing (.). In the Type designation for Length, we use the pull-down menu and change the type to Number.



Once the type is changed to Number, the user then has the choice to change the Informat and Formats. In this example we will use the defaults of BEST3. and BEST12.



Now when the file is imported, the ***Length*** field is numeric, and the value in the 11th observation is set to missing.



	Title	Length	Category	Year	Studio	Rating
1	Brave Heart	177	Action Adventure	1995	Paramount Pictu...	R
2	Casablanca	103	Drama	1942	MGM / UA	PG
3	Christmas Vacati...	97	Comedy	1989	Warner Brothers	PG-13
4	Coming to Ameri...	116	Comedy	1988	Paramount Pictu...	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 Pictu...	PG-13
8	Ghost	127	Drama Romance	1990	Paramount Pictu...	PG-13
9	Jaws	125	Action Adventure	1975	Universal Studios	PG
10	Jurassic Park	127	Action	1993	Universal Pictures	PG-13
11	Lethal Weapon	.	Action Cops &R...	1987	Warner Brothers	R
12	Michael	106	Drama	1997	Warner Brothers	PG-13
13	National Lampoo...	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 &R...	1983	Universal Studios	R

The code generated by Enterprise Guide to read in the Movies data set with the character in a numeric field is shown below. The original generated code prior to the change to the field attributes for ***Length*** is shown with the lines that Enterprise Guide changed highlighted in yellow and the modifications shown to the right.

```
DATA WORK.Movies_character_in_numeric_fie1;
    LENGTH
        Title             $ 27
        Length            $ 3---------→ Length  8
        Category          $ 20
        Year                8
        Studio            $ 18
        Rating            $ 5 ;
    FORMAT
        Title             $CHAR27.
        Length            $CHAR3. ---------→ Length  BEST12.
        Category          $CHAR20.
        Year              BEST12.
        Studio            $CHAR18.
        Rating            $CHAR5. ;
    INFORMAT
        Title             $CHAR27.
        Length            $CHAR3. ---------→ Length  BEST12.
        Category          $CHAR20.
        Year              BEST12.
        Studio            $CHAR18.
        Rating            $CHAR5. ;
    INFILE 'C:\Documents and Settings\Mira\Local Settings\Temp\
SEG4020\Movies character in numeric field-03c43d06f1ba4bf6aa0f081a96be5d38.txt'
        LRECL=72
        ENCODING="WLATIN1"
        TERMSTR=CRLF
        DLM='7F'x
        MISSOVER
        DSD ;
    INPUT
        Title             : $CHAR27.
        Length            : $CHAR3. ---------→ Length : BEST3.
        Category          : $CHAR20.
        Year              : BEST32.
        Studio            : $CHAR18.
        Rating            : $CHAR5. ;
RUN;
```

CONCLUSION

In this discussion we have seen how Enterprise Guide helps the user overcome some common problems associated with importing Excel spreadsheets. By providing wizards and the ability to manipulate the field characteristics, Enterprise Guide provides the user with the tools to create analytic data sets without writing SAS code from scratch.

TRADEMARK CITATIONS

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Mira Shapiro has been a SAS user since 1979 and is currently serving as SAS User Liaison for DC-SUG, a Washington-DC SAS Users Group. She has used SAS throughout her career as a Capacity Planner, Consultant and Biostatistician. She holds a BA in Statistics / Computer Science and an MS in Public Health / Biostatistics and works on analytics and pre-sales projects across multiple industries.

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 Advisory Board member. As the author of four books including PROC SQL: Beyond the Basics Using SAS, Kirk has written more than four hundred peer-reviewed papers, been an Invited speaker and trainer at more than four hundred SAS International, regional, local, and special-interest user group conferences and meetings throughout North America, and is the recipient of 17 "Best" contributed paper awards. His popular SAS Tips column, "Kirk's Korner of Quick and Simple Tips", appears regularly in several SAS User Group newsletters and Web sites, and his fun-filled SASword Puzzles is featured in SAScommunity.org.

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