

ASK THE EXPERT

How Do I Read and Write Excel Files Using SAS®?

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Chris leads the team of community managers for communities.sas.com, where SAS users gather and discuss SAS technologies, find answers to questions, share their experiences and provide feedback. He is also involved in SAS' strategy for user groups and other online communities with SAS customers. He gathers timely content for the user community, drawing more SAS experts into the conversations.

**WHEN SOMEONE SAYS
"I HAVE AN EXCEL DATABASE"**



Topics for this session

Working with XLSX files

Library access

- LIBNAME XSLX

Accessing Excel data
in a "natural" way
for SAS

Import / Export

- PROC IMPORT with DBMS=XLSX
- PROC EXPORT with DBMS=XLSX

Cogs in the machine for
treating Excel as inputs
and outputs of a
process

Excel reports

- ODS EXCEL, the output destination for reports

More control over
appearance and
behavior of your Excel
output

Topics we won't cover

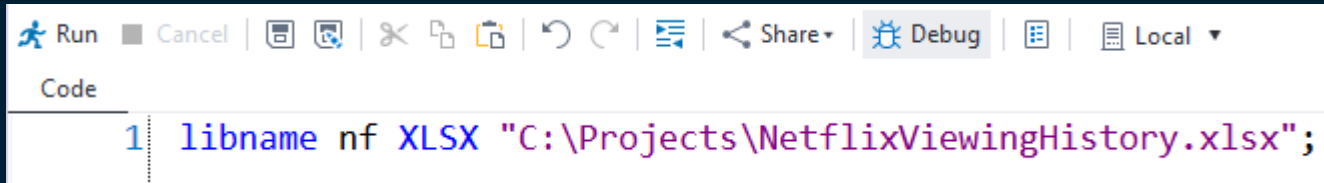
Legacy methods for working with Excel files

- PROC IMPORT and PROC EXPORT with DBMS = XLS | EXCEL | EXCELCS
- LIBNAME EXCEL | PCFILES (using PC Files Server technology)
- SAS Enterprise Guide tasks for Import Excel, Share to Excel

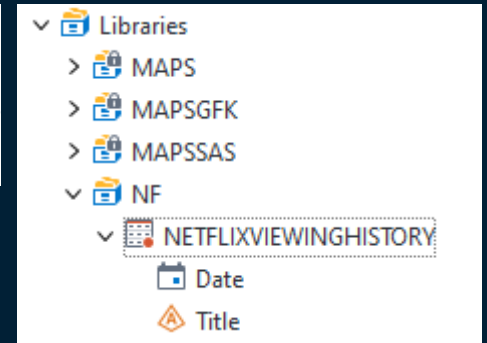
Using LIBNAME XLSX

Make your Excel file look/act like SAS data

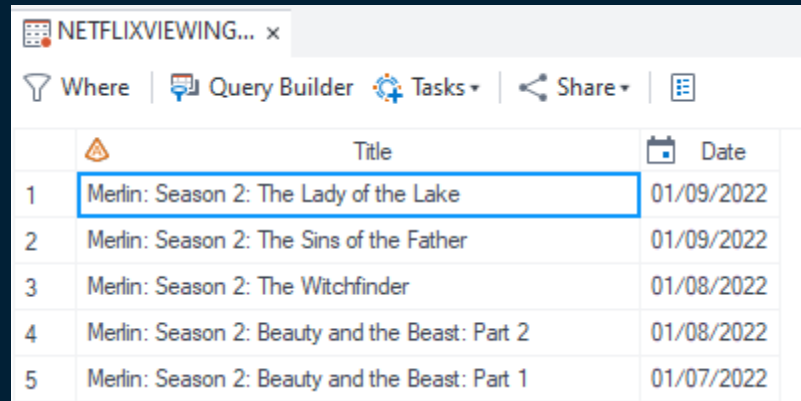
```
libname libref XLSX 'path-to-xlsx-file.xlsx';
```



A screenshot of the SAS code editor interface. The top toolbar includes buttons for Run, Cancel, Save, Copy, Paste, Undo, Redo, and a dropdown menu for Local. Below the toolbar, the code editor shows a single line of SAS code: `1 libname nf XLSX "C:\Projects\NetflixViewingHistory.xlsx";`



A screenshot of the SAS Libraries window. The 'Libraries' pane is expanded to show a folder named 'NF'. Inside the 'NF' folder, a library named 'NETFLIXVIEWINGHISTORY' is listed and highlighted with a dashed border. Below the library name, two variables are visible: 'Date' and 'Title'.



A screenshot of the SAS Data Viewer window titled 'NETFLIXVIEWING... x'. The window shows a table with two columns: 'Title' and 'Date'. The first row is highlighted with a blue border.

	Title	Date
1	Merlin: Season 2: The Lady of the Lake	01/09/2022
2	Merlin: Season 2: The Sins of the Father	01/09/2022
3	Merlin: Season 2: The Witchfinder	01/08/2022
4	Merlin: Season 2: Beauty and the Beast: Part 2	01/08/2022
5	Merlin: Season 2: Beauty and the Beast: Part 1	01/07/2022

LIBNAME XLSX with multiple sheets

Each sheet appears as a table in the library

Excel

	A	B	
1	Title	Date	
2	Merlin: Season 2: T	1/9/2022	
3	Merlin: Season 2: T	1/9/2022	
4	Merlin: Season 2: T	1/8/2022	
5	Merlin: Season 2: E	1/8/2022	
6	Merlin: Season 2: E	1/7/2022	
7	Merlin: Season 2: L	1/7/2022	

Parents Kids

SAS

```
Code
1 libname nf XLSX "C:\Projects\NetflixAll.xlsx";
2 proc datasets lib=nf;
3 quit;
```

#	Name	Member Type	DBMSTYPE
1	KIDS	DATA	TABLE
2	PARENTS	DATA	TABLE

- Libraries
 - MAPS
 - MAPSGFK
 - MAPSSAS
 - NF
 - KIDS
 - PARENTS
 - SASHELP

Important notes about LIBNAME XLSX

- 'XLSX' keyword is **required** on the LIBNAME statement
 - else SAS defaults to EXCEL engine, which requires drivers from Microsoft
- A column with "mixed" types (char and num) will result in character data
- XLSX is a **sequential** data engine. Operations that require random access are not supported
- Most database-related LIBNAME options do not apply
- While library is assigned, you cannot edit in Excel

PROC IMPORT with DBMS=XLSX

Provides more control for how Excel data is read

```
proc import
  datafile="file-path-name.xlsx"
  DBMS=XLSX
  out=outlib.data
  REPLACE /* optional */
  ;
  getnames=YES|NO;
  range= 'range-spec';
  sheet= 'sheetname';
run;
```

- Use to get spreadsheet data into SAS, and then work with it as SAS data.
- Read an entire sheet, a **named range**, or a specified range of cells
- "Don't replace" is default, so use REPLACE to overwrite a data set

Specify which sheet to import

Use the SHEET statement

```
Code
1 proc import
2   datafile="C:\Projects\NetflixAll.xlsx"
3   DBMS=XLSX
4   out=work.nf
5   REPLACE
6   ;
7 run;
```

Log Results (0) Output Data (1)

< Where Query Builder Tasks

	Title	Date
1	Jupiter's Legacy: Volume 1: How It All Ends	05/24/2021
2	Jupiter's Legacy: Volume 1: Omnes Pro Uno	05/24/2021
3	Jupiter's Legacy: Volume 1: Cover Her Face	05/24/2021
4	Jupiter's Legacy: Volume 1: What's the Use?	05/24/2021
5	Jupiter's Legacy: Volume 1: All the Devils Are Here	05/24/2021
6	Jupiter's Legacy: Volume 1: Painting the Clouds With Sunshine	05/23/2021

```
Code
1 proc import
2   datafile="C:\Projects\NetflixAll.xlsx"
3   DBMS=XLSX
4   out=work.nf
5   REPLACE
6   ;
7   SHEET='Kids';
8 run;
```

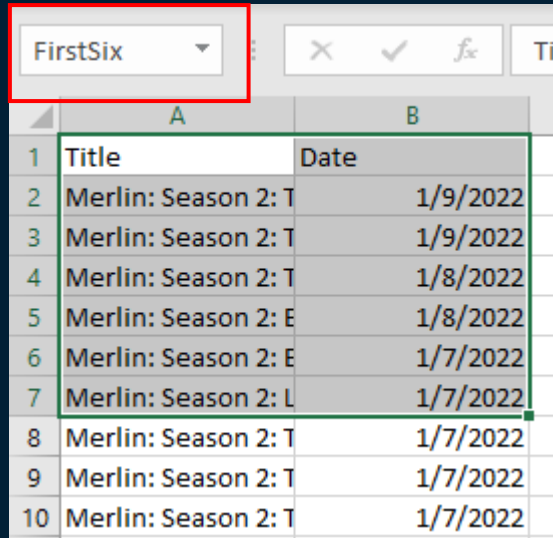
Log Results (0) Output Data (1)

< Where Query Builder Tasks

	Title	Date
1	Merlin: Season 2: The Lady of the Lake	01/09/2022
2	Merlin: Season 2: The Sins of the Father	01/09/2022
3	Merlin: Season 2: The Witchfinder	01/08/2022
4	Merlin: Season 2: Beauty and the Beast...	01/08/2022
5	Merlin: Season 2: Beauty and the Beast...	01/07/2022
6	Merlin: Season 2: Lancelot and Guineve...	01/07/2022

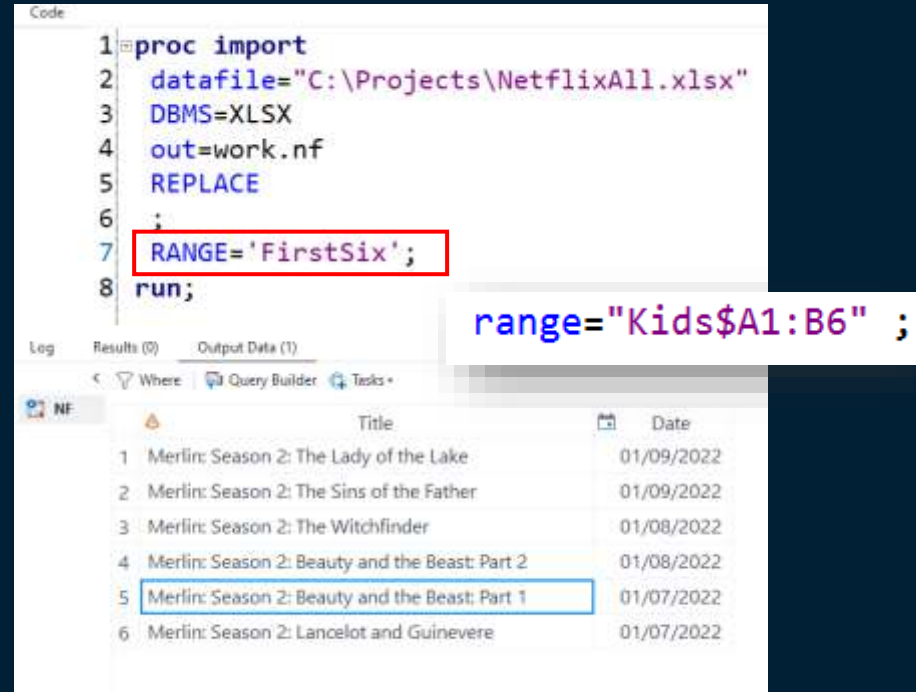
Import just a specific range

Use the RANGE statement for named range or cell range



The screenshot shows an Excel spreadsheet with a named range 'FirstSix' highlighted in red. The spreadsheet contains the following data:

	A	B
1	Title	Date
2	Merlin: Season 2: T	1/9/2022
3	Merlin: Season 2: T	1/9/2022
4	Merlin: Season 2: T	1/8/2022
5	Merlin: Season 2: E	1/8/2022
6	Merlin: Season 2: E	1/7/2022
7	Merlin: Season 2: L	1/7/2022
8	Merlin: Season 2: T	1/7/2022
9	Merlin: Season 2: T	1/7/2022
10	Merlin: Season 2: T	1/7/2022



The screenshot shows the SAS code editor and the resulting data table. The code uses the `RANGE='FirstSix';` statement to import a specific range from the Excel file. The resulting data table is shown below:

```
1 proc import
2   datafile="C:\Projects\NetflixAll.xlsx"
3   DBMS=XLSX
4   out=work.nf
5   REPLACE
6   ;
7   RANGE='FirstSix';
8 run;
```

range="Kids\$A1:B6" ;

	Title	Date
1	Merlin: Season 2: The Lady of the Lake	01/09/2022
2	Merlin: Season 2: The Sins of the Father	01/09/2022
3	Merlin: Season 2: The Witchfinder	01/08/2022
4	Merlin: Season 2: Beauty and the Beast: Part 2	01/08/2022
5	Merlin: Season 2: Beauty and the Beast: Part 1	01/07/2022
6	Merlin: Season 2: Lancelot and Guinevere	01/07/2022

Impact of VALIDVARNAME option

Do you want Excel-friendly names or SAS standard names?

LIBNAME XLSX and PROC IMPORT will enforce column name rules

	A	B
1	Show Title	Date Watched
2	Merlin: Season 2: T	1/9/2022
3	Merlin: Season 2: T	1/9/2022
4	Merlin: Season 2: T	1/8/2022
5	Merlin: Season 2: E	1/8/2022
6	Merlin: Season 2: E	1/7/2022
7	Merlin: Season 2: L	1/7/2022

	Show Title	Date Watched
1	Merlin: Season 2: The Lady of the Lake	01/09/2022
2	Merlin: Season 2: The Sins of the Father	01/09/2022
		01/08/2022
	part 2	01/08/2022

```
options validvarname=any;
```

	Show_Title	Date_Watched
1	Merlin: Season 2: The Lady of the Lake	01/09/2022
2	Merlin: Season 2: The Sins of the Father	01/09/2022
		01/08/2022
	part 2	01/08/2022

```
options validvarname=v7;
```

PROC EXPORT with DBMS=XLSX

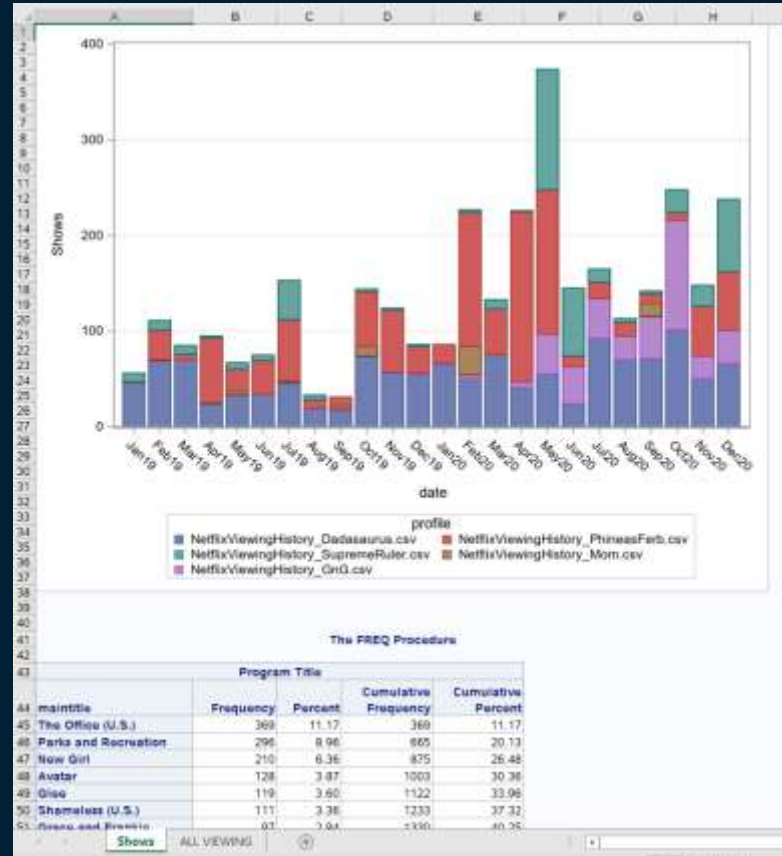
Just the data – rows and columns

```
proc export
  data=libref.data
  DBMS=XLSX
  outfile="path-to-file.xlsx"
  REPLACE /* optional */
  ;
  sheet= 'sheetname';
run;
```

- Can create a new XLSX or update an existing workbook
- Add or replace content with SHEET=, even if existing workbook not created by SAS
- SAS values should maintain precision – even if appearance is different
- SAS date and datetime values will convert to Excel date values

Use ODS EXCEL for report-style output

- Support for formatting, formulas, graphics and more
- This replaces tagsets.excelxp – use ODS EXCEL instead
- Always **creates** a new Excel file
- **Extensive** documentation available



Combine ODS EXCEL and PROC EXPORT

Create report-style workbooks with detailed data included

```
%let dest = C:/Projects/report.xlsx;  
ods excel(id=custom) file="&dest." options  
  ( sheet_interval='none' sheet_name='Shows');
```

```
ods graphics / width=768 height=600;  
proc sgplot data=viewing;  
  ...  
run;
```

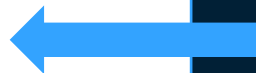
```
proc freq data=viewing ORDER=freq;  
  ...  
run;
```

```
ods excel(id=custom) close;
```

```
proc export data=viewing  
  outfile="&dest."  
  dbms=xlsx  
  replace;  
  sheet="ALL VIEWING";  
run;
```

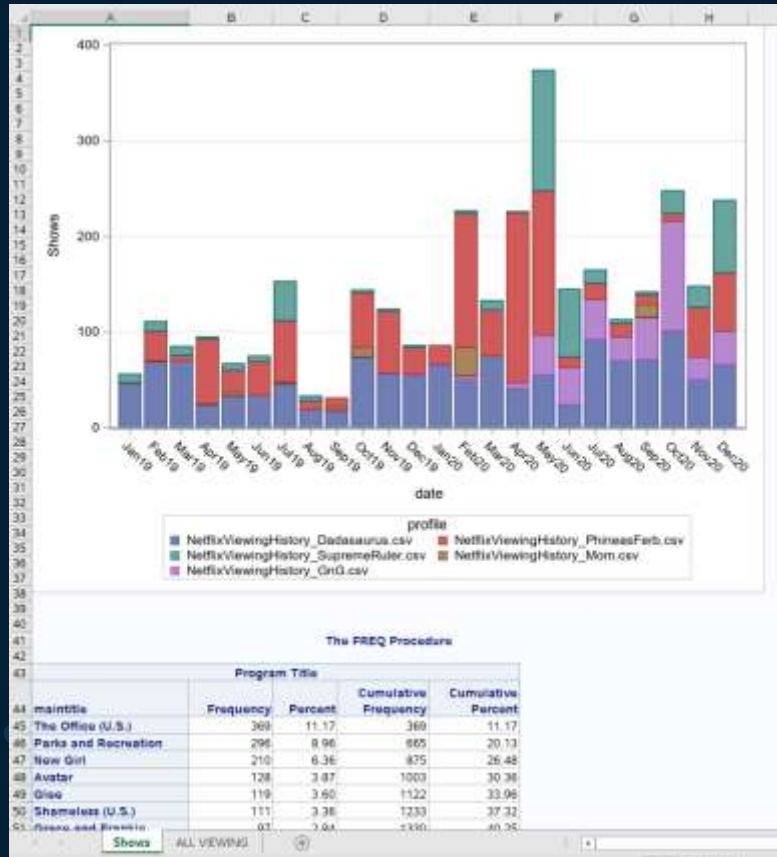


Create Excel file with
graph and PROC output



Update existing Excel file
to add new sheet for
detail data

ODS EXCEL and PROC EXPORT example



title	date	maintitle	episode	season	profile
1 Jupiter's Legacy: Volume 1: How it All Ends	24-May-21	Jupiter's Legacy	How it All Ends	Netflix/Vi	
2 Jupiter's Legacy: Volume 1: Omnes Pro Uno	24-May-21	Jupiter's Legacy	Omnes Pro Uno	Netflix/Vi	
3 Jupiter's Legacy: Volume 1: Cover Her Face	24-May-21	Jupiter's Legacy	Cover Her Face	Netflix/Vi	
4 Jupiter's Legacy: Volume 1: What's the Use?	24-May-21	Jupiter's Legacy	What's the Use	Netflix/Vi	
5 Jupiter's Legacy: Volume 1: All the Devils Are He	24-May-21	Jupiter's Legacy	All the Devils Ar	Netflix/Vi	
6 Jupiter's Legacy: Volume 1: Painting the Clouds I	23-May-21	Jupiter's Legacy	Painting the Clo	Netflix/Vi	
7 Jupiter's Legacy: Volume 1: Paper and Stone	23-May-21	Jupiter's Legacy	Paper and Stone	Netflix/Vi	
8 Jupiter's Legacy: Volume 1: By Dawn's Early Light	23-May-21	Jupiter's Legacy	By Dawn's Early	Netflix/Vi	
9 Tiger King: Murder, Mayhem and Madness: Link	18-May-21	Tiger King	Limited Series	Netflix/Vi	
10 Barbie Life in the Dreamhouse: Season 1: Best o	13-May-21	Barbie Life in the Dream	Best of Kan	Season Netflix/Vi	
11 Scarface	11-May-21	Scarface		Netflix/Vi	
12 My Neighbor Totoro	10-May-21	My Neighbor Totoro		Netflix/Vi	
13 Head's Mating Castle	10-May-21	Head's Mating Castle		Netflix/Vi	
14 John Mulaney: The Comeback Kid	10-May-21	John Mulaney		Netflix/Vi	
15 The Circle: Season 2: Alliances Are Formed	9-May-21	The Circle	Alliances Are F	Season Netflix/Vi	
16 New Girl: Season 5: Goosebumps Walkaway	4-May-21	New Girl	Goosebumps W	Season Netflix/Vi	
17 Back to the Future	3-May-21	Back to the Future		Netflix/Vi	
18 John Wick	20-Apr-21	John Wick		Netflix/Vi	
19 Spirited Away	26-Apr-21	Spirited Away		Netflix/Vi	
20 The Circle: Season 2: Back and More Savage Th	14-Apr-21	The Circle	Back and More	Season Netflix/Vi	
21 Castle in the Sky	11-Apr-21	Castle in the Sky		Netflix/Vi	
22 Braintail: Season 1: Social Media	10-Apr-21	Braintail	Social Media	Season Netflix/Vi	
23 New Girl: Season 5: The Decision	30-Mar-21	New Girl	The Decision	Season Netflix/Vi	
24 New Girl: Season 5: Wig	30-Mar-21	New Girl	Wig	Season Netflix/Vi	
25 Spotlight	29-Mar-21	Spotlight		Netflix/Vi	
26 Nate Bargatze: The Greatest Average American	19-Mar-21	Nate Bargatze		Netflix/Vi	
27 Breaking Bad: Season 2: Seven Thirty-Seven	15-Mar-21	Breaking Bad	Seven Thirty-Se	Season Netflix/Vi	
28 Shameless (U.S.): Season 4: Strangers on a Tra	12-Mar-21	Shameless (U.S.)	Strangers on a	Season Netflix/Vi	
29 Shameless (U.S.): Season 4: Like Father, Like D	12-Mar-21	Shameless (U.S.)	Like Father, Lik	Season Netflix/Vi	
30 Paul Blart: Mall Cop	9-Mar-21	Paul Blart		Netflix/Vi	
31 Shameless (U.S.): Season 4: My Oldest Daught	4-Mar-21	Shameless (U.S.)	My Oldest Daug	Season Netflix/Vi	
32 Shameless (U.S.): Season 4: Simple Pleasur	3-Mar-21	Shameless (U.S.)	Simple Pleasur	Season Netflix/Vi	
33 Shameless (U.S.): Season 3: Survival of the F	3-Mar-21	Shameless (U.S.)	Survival of the F	Season Netflix/Vi	
34 Shameless (U.S.): Season 3: Order Room Sen	3-Mar-21	Shameless (U.S.)	Order Room Se	Season Netflix/Vi	
35 Black Mirror: Season 5: Smithereens	26-Feb-21	Black Mirror	Smithereens	Season Netflix/Vi	
36 Black Mirror: Season 4: Nosedive	26-Feb-21	Black Mirror	Nosedive	Season Netflix/Vi	
37 Black Mirror: Season 4: Melahed	26-Feb-21	Black Mirror	Melahed	Season Netflix/Vi	
38 Shameless (U.S.): Season 3: CWI Wrongs	25-Feb-21	Shameless (U.S.)	CWI Wrongs	Season Netflix/Vi	
39 Shameless (U.S.): Season 3: Frank the Plumber	24-Feb-21	Shameless (U.S.)	Frank the Plum	Season Netflix/Vi	
40 Shameless (U.S.): Season 3: When There's a W	24-Feb-21	Shameless (U.S.)	When There's a	Season Netflix/Vi	
41 Shameless (U.S.): Season 3: A Long Way from I	23-Feb-21	Shameless (U.S.)	A Long Way to	Season Netflix/Vi	
42 Shameless (U.S.): Season 3: Cascading Failur	23-Feb-21	Shameless (U.S.)	Cascading Fail	Season Netflix/Vi	
43 Shameless (U.S.): Season 3: The Sins of My Ca	19-Feb-21	Shameless (U.S.)	The Sins of My	Season Netflix/Vi	
44 Shameless (U.S.): Season 3: The Helpl	17-Feb-21	Shameless (U.S.)	The Helpl	Season Netflix/Vi	
45 Shameless (U.S.): Season 3: May I Trim Your He	16-Feb-21	Shameless (U.S.)	May I Trim Your	Season Netflix/Vi	
46 Shameless (U.S.): Season 3: The American Dea	16-Feb-21	Shameless (U.S.)	The American D	Season Netflix/Vi	
47 Shameless (U.S.): Season 3: El Gran Cañon	16-Feb-21	Shameless (U.S.)	El Gran Cañon	Season Netflix/Vi	
48 Shameless (U.S.): Season 2: Fiona Interrupte	16-Feb-21	Shameless (U.S.)	Fiona Interrupte	Season Netflix/Vi	
49 Ratched: Season 1: The Bucket List	15-Feb-21	Ratched	The Bucket List	Season Netflix/Vi	



DEMO

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Q&A

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Thank you
for joining us for
this SAS webinar