



# The Future of SAS Enterprise Guide and SAS Studio



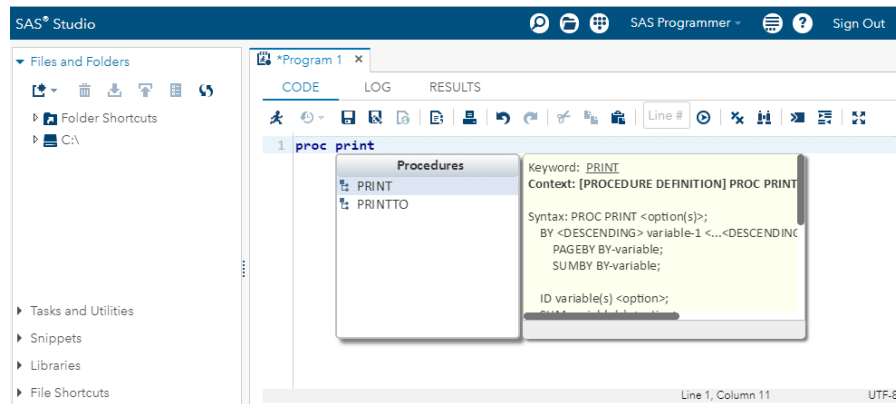
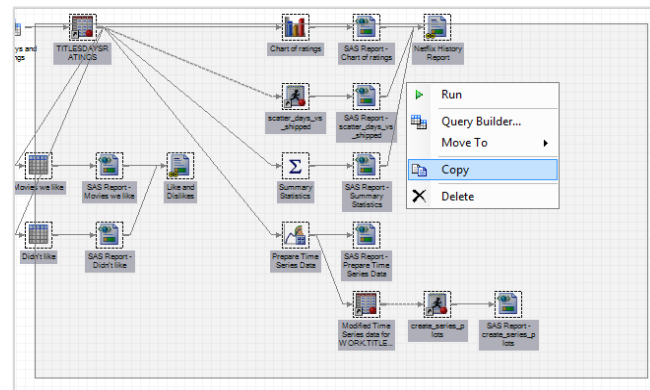
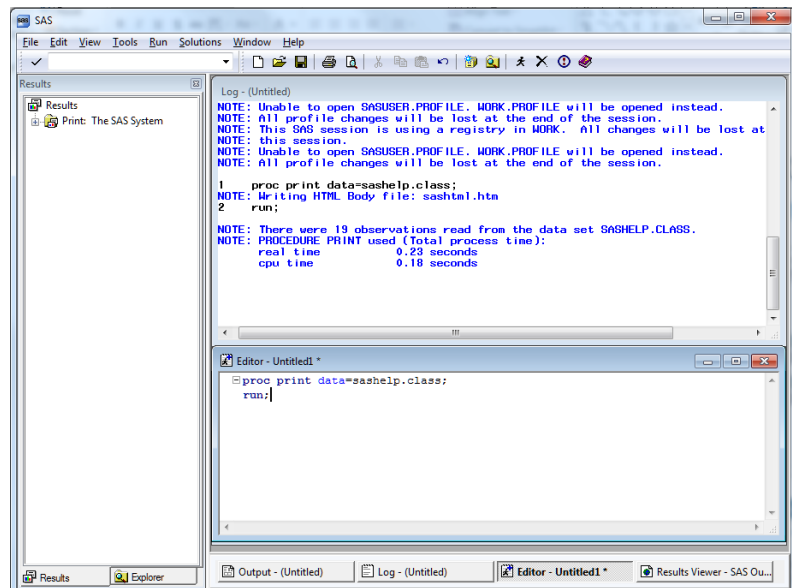
# Agenda

- Where we've come from
- Where we are
- Where are we going?
- What's coming in SAS Enterprise Guide
- What's coming in SAS Studio
- Roadmap



# Where We've Come From

## SAS Display Manager, SAS Enterprise Guide, SAS Studio



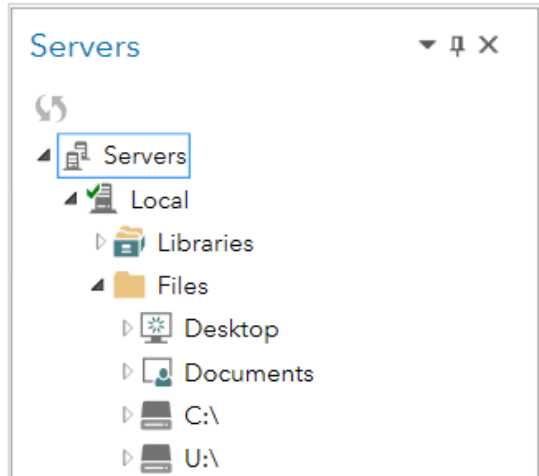




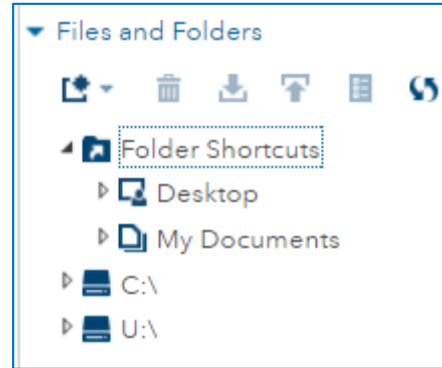
# Where We Are

## What's common between SAS Enterprise Guide and SAS Studio

- Common file navigation



SAS Enterprise Guide



SAS Studio

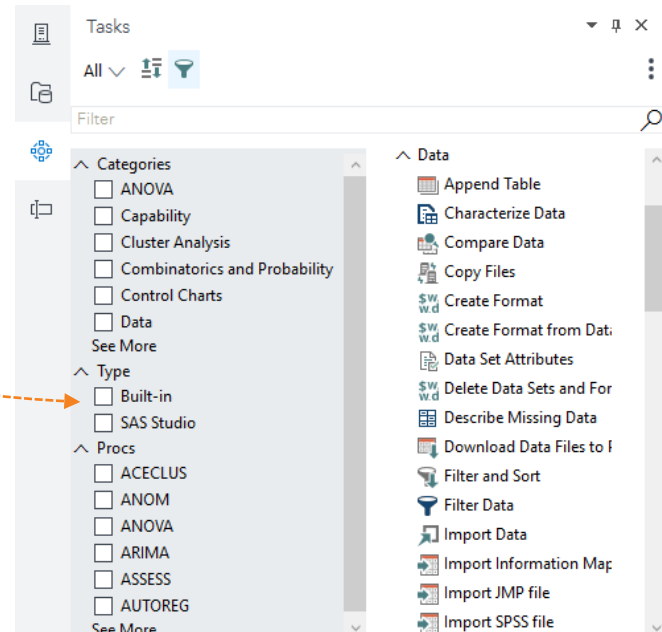
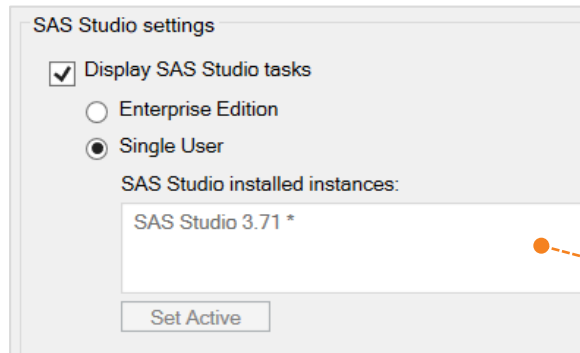




# Where We Are

## What's common between SAS Enterprise Guide and SAS Studio

- Use SAS Studio tasks in SAS Enterprise Guide

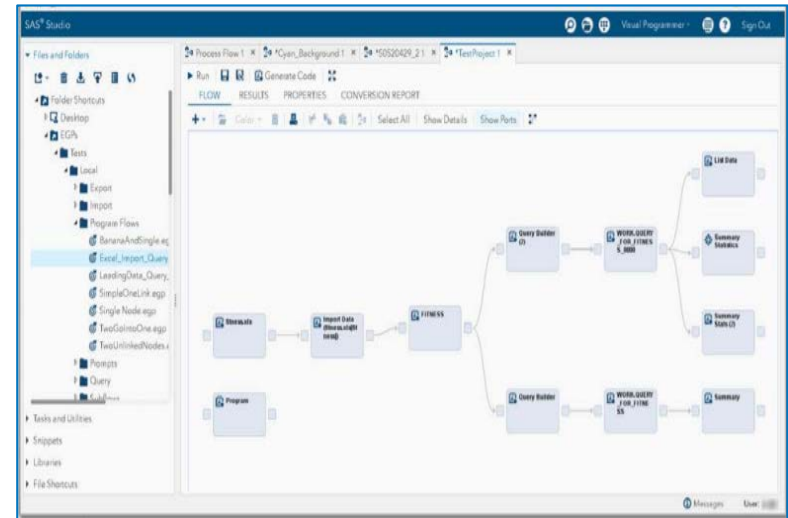
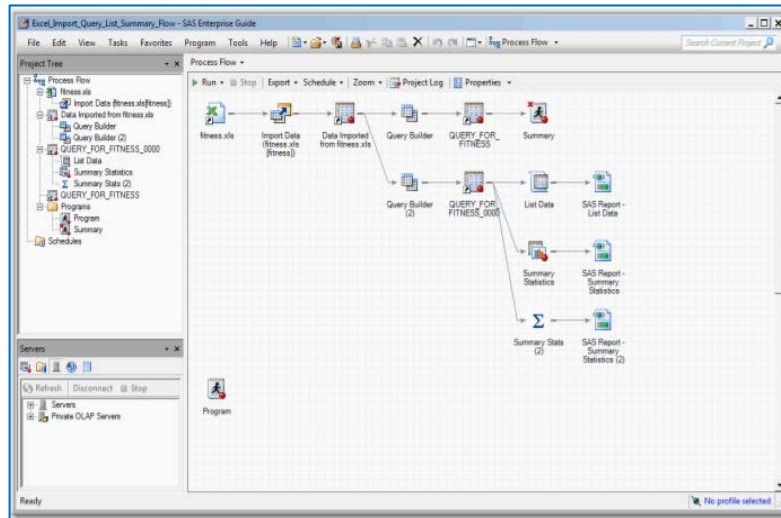




# Where We Are

## What's common between SAS Enterprise Guide and SAS Studio

- Convert EGP files to SAS Studio process flows (experimental for SAS Studio 3.6, production 3.7)





# Where Are We Going?

## Interoperability between SAS Enterprise Guide and SAS Studio

- Short Term:
  - Bring the SAS programmer features of SAS Studio into SAS Enterprise Guide
  - Bring the assistive / point-and-click features of SAS Enterprise Guide into SAS Studio
- Long Term:
  - Expand common assets beyond .sas files
  - Execution convergence – consistent way of executing jobs
- Ultimate Goal:
  - Users move seamlessly between the two leveraging the strengths of each – browser and rich-client





01 Develop code in  
SAS Enterprise  
Guide



02

Submit code



04

Submit code



03

Pick-up code in  
SAS Studio





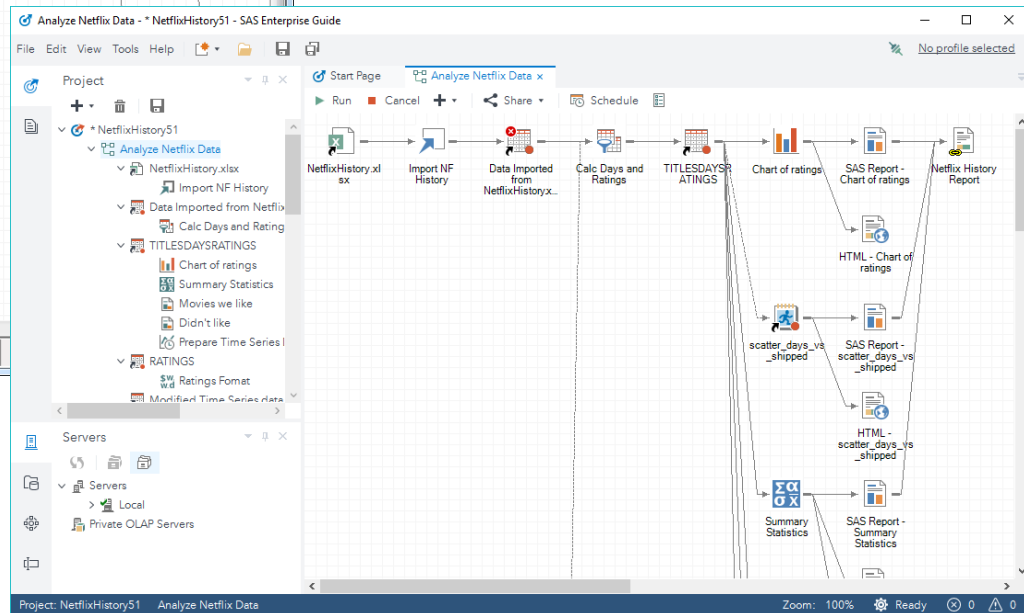
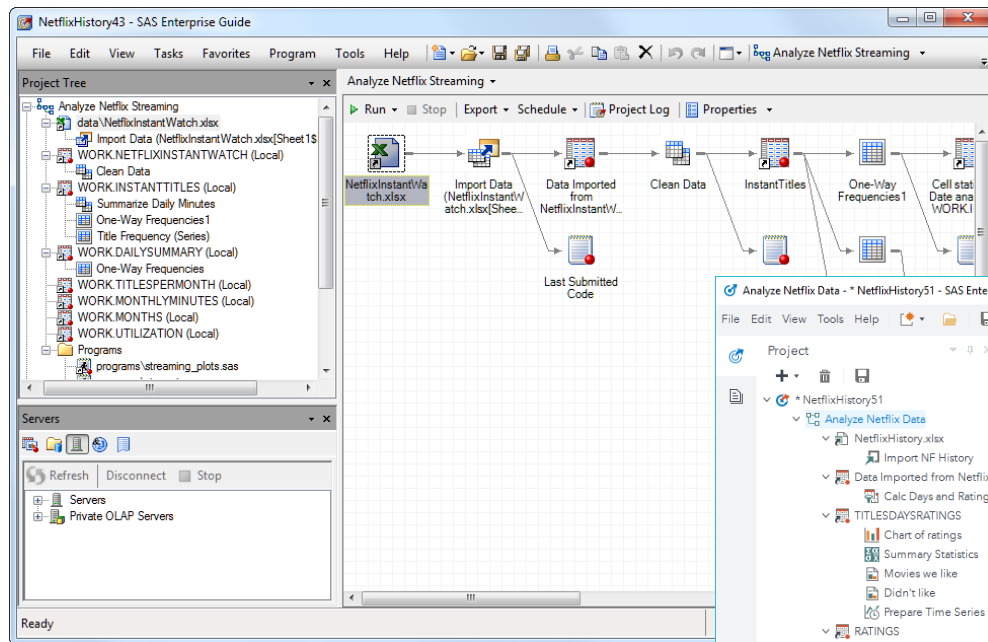
# What's Coming for SAS Enterprise Guide

## Major Release (8.1) Planned for 2019

- Refresh of the UI to match current SAS themes.
- Window docking management.
  - Drag and float or dock with drop zone previews
  - Tear-off views
  - Leverage multiple monitors
- Ability to create, edit, and save SAS code without requiring a project or process flow.

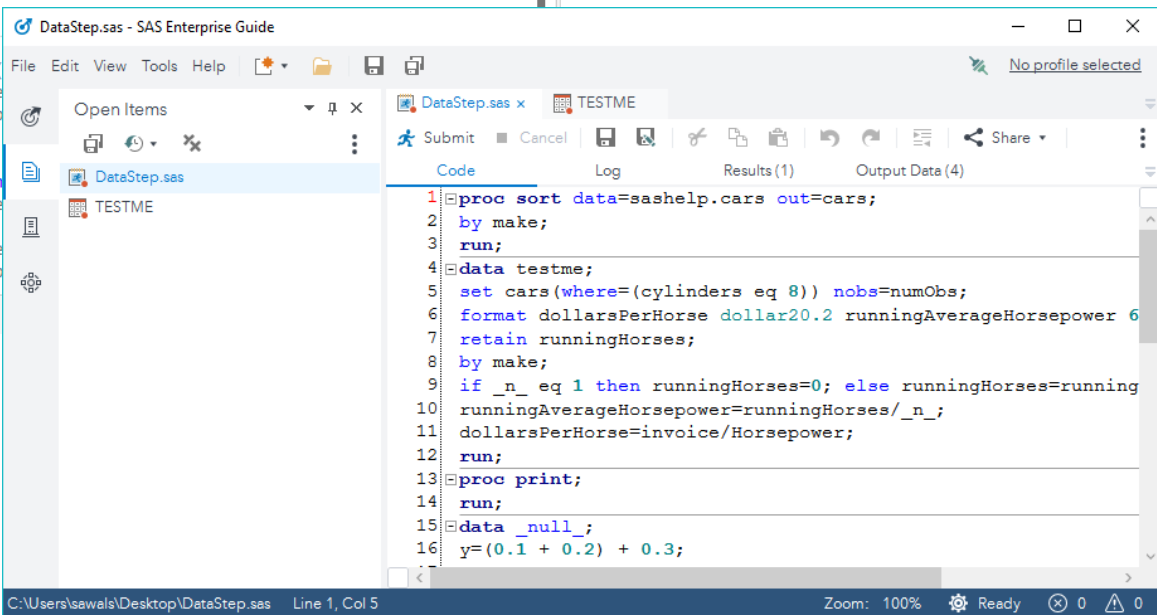
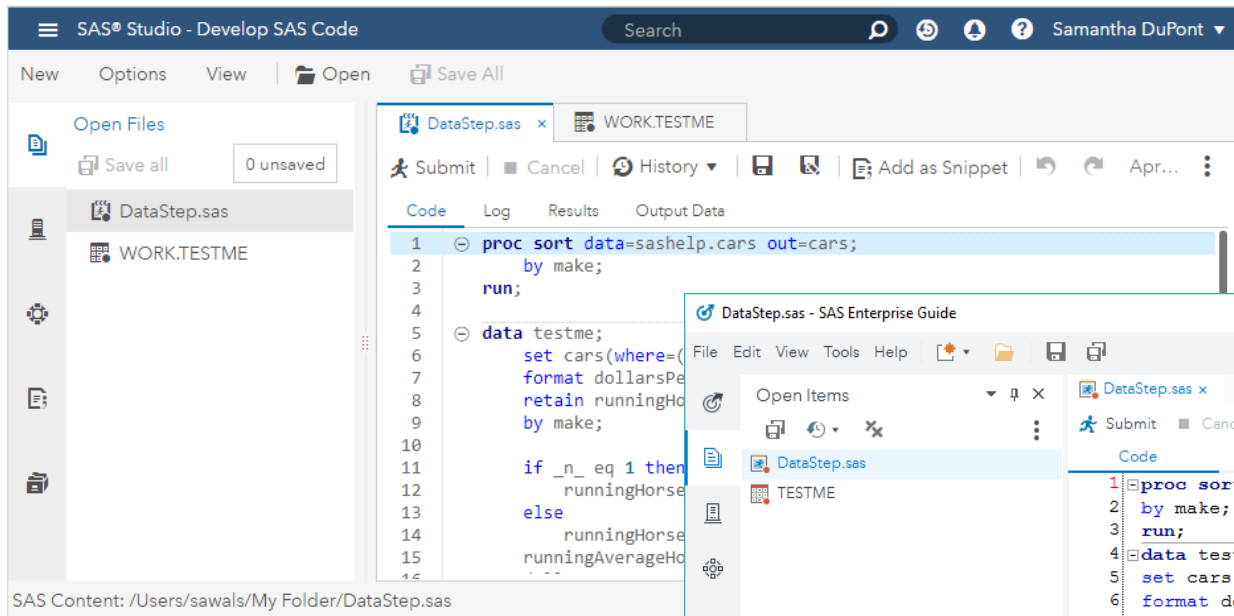


# Refresh the Look





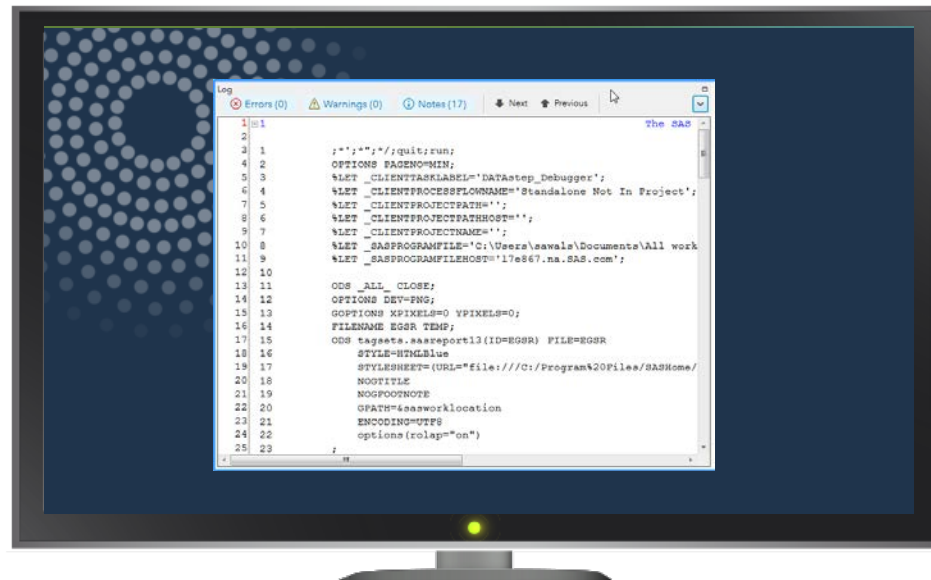
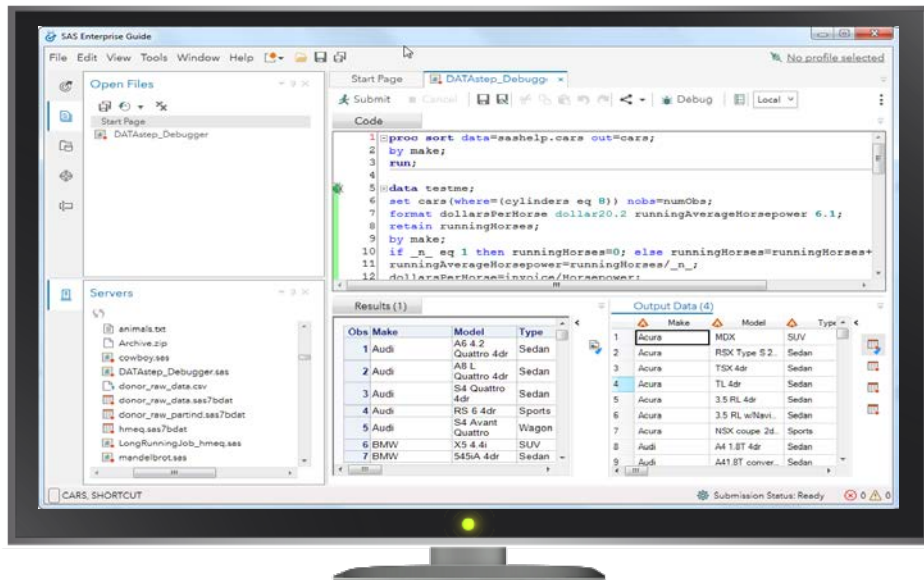
# Establish a Familial Resemblance Across SAS Products





# Lots of Pane Layout Flexibility

## Dock, Float, Stack





# Layout Major and Minor Tabs

CARS - SAS Enterprise Guide

File Edit View Tools Help

Open Items

- DataStep.sas
- TESTME
- A
- B
- CARS

DataStep.sas x

Submit Cancel

Output Data (4)

Code Log

Where Query Builder

	Name	Sex	Age	Height
1	Alice	F	13	56.5
2	Barbara	F	13	65.3
3	Carol	F	14	62.8
4	Jane	F	12	59.8
5	Janet	F	15	62.5
6	Joyce	F	11	51.3
7	Judy	F	14	64.3
8	Louise	F	12	56.3
9	Marv	F	15	66.5

CARS

TESTME

A

B

B x

TESTME x

CARS x

Where Query Builder

	Name	Sex	Age
1	Alice	F	
2	Barbara	F	
3	Carol	F	
4	Jane	F	
5	Janet	F	
6	Joyce	F	
7	Judy	F	
8	Louise	F	
9	Marv	F	

	Make	Model	Type
1	Audi	A6 4.2 Quattro...	Sedan
2	Audi	A8 L Quattro 4dr	Sedan
3	Audi	S4 Quattro 4dr	Sedan
4	Audi	RS 6 4dr	Sports
5	Audi	S4 Avant Quatt...	Wagon
6	BMW	X5 4.4i	SUV
7	BMW	545iA 4dr	Sedan
8	BMW	745i 4dr	Sedan

	Make	Model	Type
1	Acura	MDX	SUV
2	Acura	RSX Type S 2dr	Sedan
3	Acura	TSX 4dr	Sedan
4	Acura	TL 4dr	Sedan
5	Acura	3.5 RL 4dr	Sedan
6	Acura	3.5 RL w/Navig...	Sedan
7	Acura	NSX coupe 2dr...	Sports
8	Audi	A4 1.8T 4dr	Sedan
9	Audi	A41 8T converti	Sedan

Local: WORK.CARS

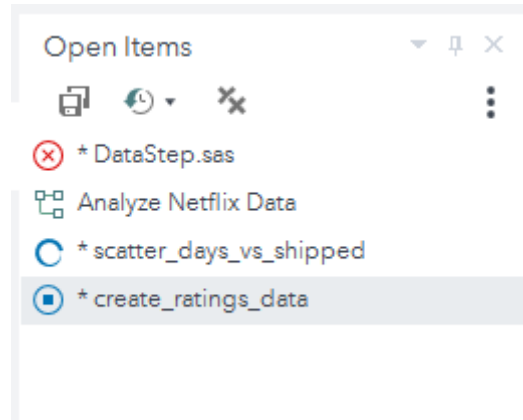
Zoom: 100% Ready





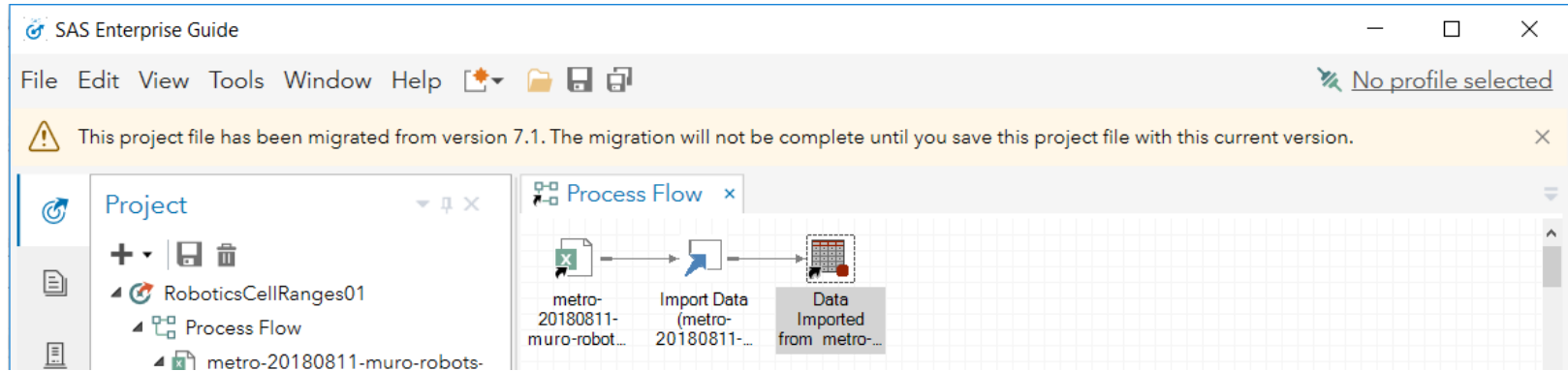
# Open Files

- See status of files that are open – queued to be submitted, submitting, need to be saved
- Organize tabs – close, rearrange





# Better Notifications That Don't Get in Your Way





# Output Data Performance Options

- New options for controlling what output data to open automatically

When generating tables in a program, automatically open:

Last table ▾

☒ Unlock open data after inactivity (minutes):

☐ Unlock all open data before running code

☐ Automatically refresh open data tabs after running code

DataStep.sas x

Submit Cancel Save Copy Paste Print Refresh Undo Redo Share Debug Changes Commit History

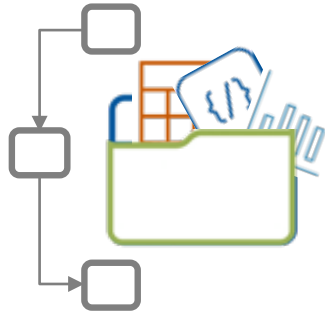
Code Log Results (1) Output Data (4)

Where Query Builder Open with Task

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize
1	Audi	A6 4.2 Quattro...	Sedan	Europe	All	\$49,690	\$44,936	4
2	Audi	A8 L Quattro 4dr	Sedan	Europe	All	\$69,190	\$64,740	4
3	Audi	S4 Quattro 4dr	Sedan	Europe	All	\$48,040	\$43,556	4
4	Audi	RS 6 4dr	Sports	Europe	Front	\$84,600	\$76,417	4
5	Audi	S4 Avant Quatt...	Wagon	Europe	All	\$49,090	\$44,446	4
6	BMW	X5 4.4i	SUV	Europe	All	\$52,195	\$47,720	4
7	BMW	545iA 4dr	Sedan	Europe	Rear	\$54,995	\$50,270	4
8	BMW	745i 4dr	Sedan	Europe	Rear	\$69,195	\$63,190	4
9	BMW	745Li 4dr	Sedan	Europe	Rear	\$73,195	\$66,830	4
10	Cadillac	Escalade	SUV	USA	Front	\$52,795	\$48,377	5
11	Cadillac	SRX V8	SUV	USA	Front	\$46,995	\$43,523	4
12	Cadillac	Deville 4dr	Sedan	USA	Front	\$45,445	\$41,650	4
13	Cadillac	Deville DTS 4dr	Sedan	USA	Front	\$50,595	\$46,362	4
14	Cadillac	Seville SLS 4dr	Sedan	USA	Front	\$47,955	\$43,841	4
15	Cadillac	XLR convertible...	Sports	USA	Rear	\$76,200	\$70,546	4
16	Cadillac	Escalade EXT	Truck	USA	All	\$52,975	\$48,541	4
17	Chevrolet	Suburban 1500...	SUV	USA	Front	\$42,735	\$37,422	5
18	Chevrolet	Tahoe LT	SUV	USA	All	\$41,465	\$36,287	5
19	Chevrolet	Camaro 2dr	Sports	USA	Rear	\$44,535	\$39,060	5



# Adding Files to a Project Automatically



I love the way EG adds  
files to projects and  
process flows for me



## Project and Process Flows

Reset

☒ When an item is opened automatically add to the project

### General

☐ Enable automatic file addition to projects

Option to automatically add  
items to a project

A screenshot of the SAS Enterprise Guide interface. The left pane shows a project tree with the following structure:

- Project
  - \* NetflixHistory51
    - Analyze Netflix Data
      - NetflixHistory.xlsx
        - Import NF History
      - \* Data Imported from NetflixHistory51
        - Calc Days and Ratings
      - \* TITLEDAYS RATINGS
        - Chart of ratings
        - Summary Statistics
        - Movies we like
        - Didn't like
        - Prepare Time Series Data
      - RATINGS
        - \* Modified Time Series data for samclass.pdf
        - Text
      - Programs
        - create\_ratings\_data
        - scatter\_days\_vs\_shipped
        - create\_series\_plots
        - DataStep.sas
      - Analyze Netflix Streaming

The right pane shows a code editor with the following SAS code:

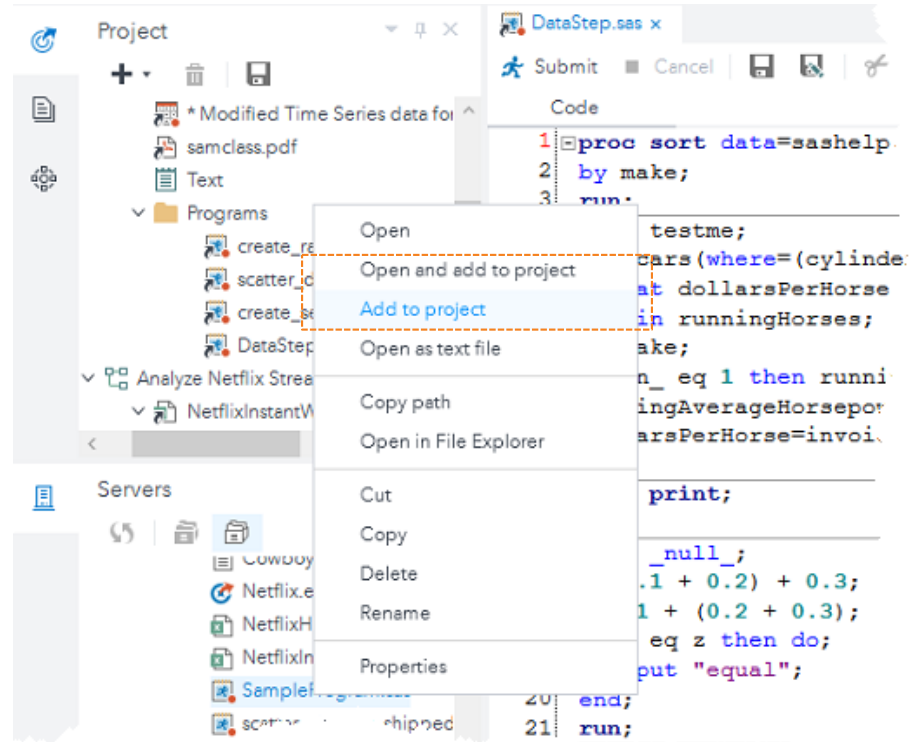
```
1 proc sort data=sashelp.c  
2 by make;  
3 run;  
4 data testme;  
5 set cars (where=(cylinder  
6 format dollarsPerHorse d  
7 retain runningHorses;  
8 by make;  
9 if _n_ eq 1 then running  
10 runningAverageHorsepower  
11 dollarsPerHorse=invoice/  
12 run;  
13 proc print;  
14 run;  
15 data _null_;  
16 y=(0.1 + 0.2) + 0.3;  
17 z=0.1 + (0.2 + 0.3);  
18 if y eq z then do;  
19 put "equal";  
20 end;  
21 run;  
22 data a;  
23 set sashelp.class;  
24 if sex eq "F";
```



# Add Files to a Project Manually



I love the idea of a projects and process flows, but I want to add files myself

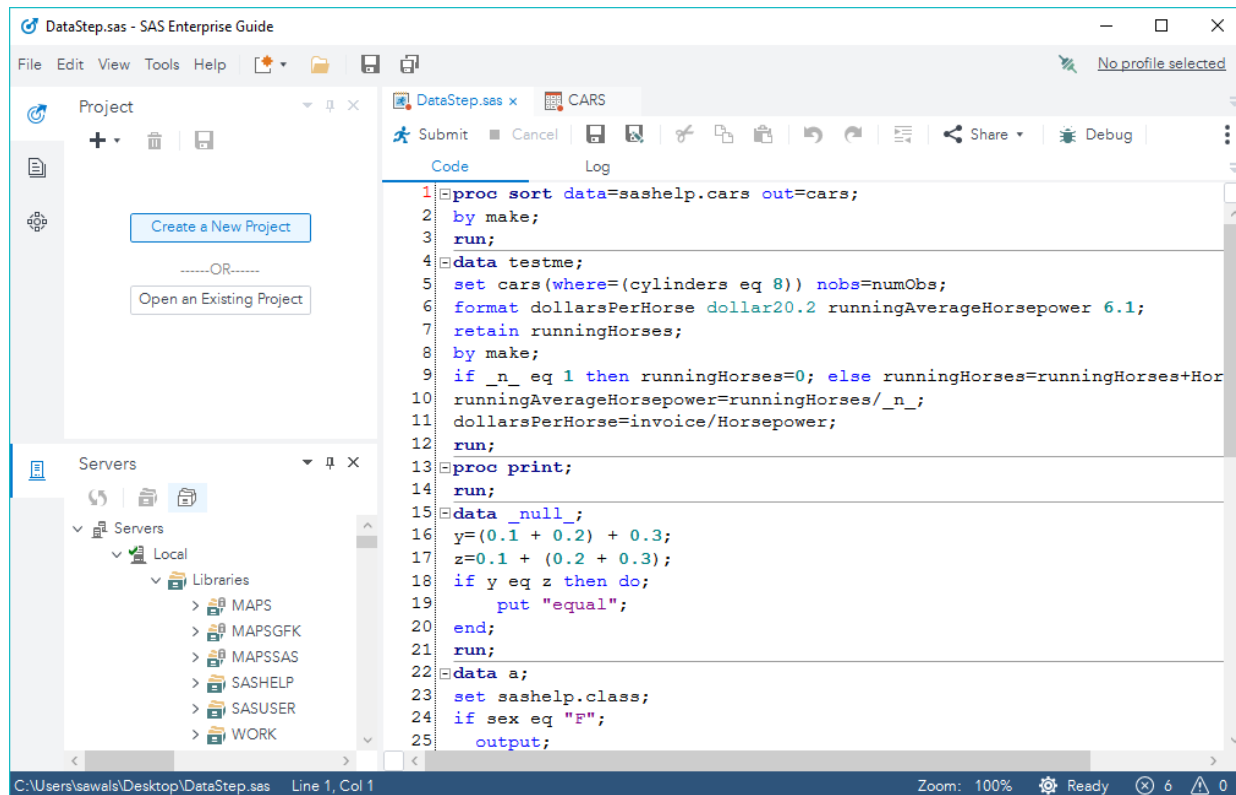




# No Project!



I just want to program – not  
interested in projects or  
process flows







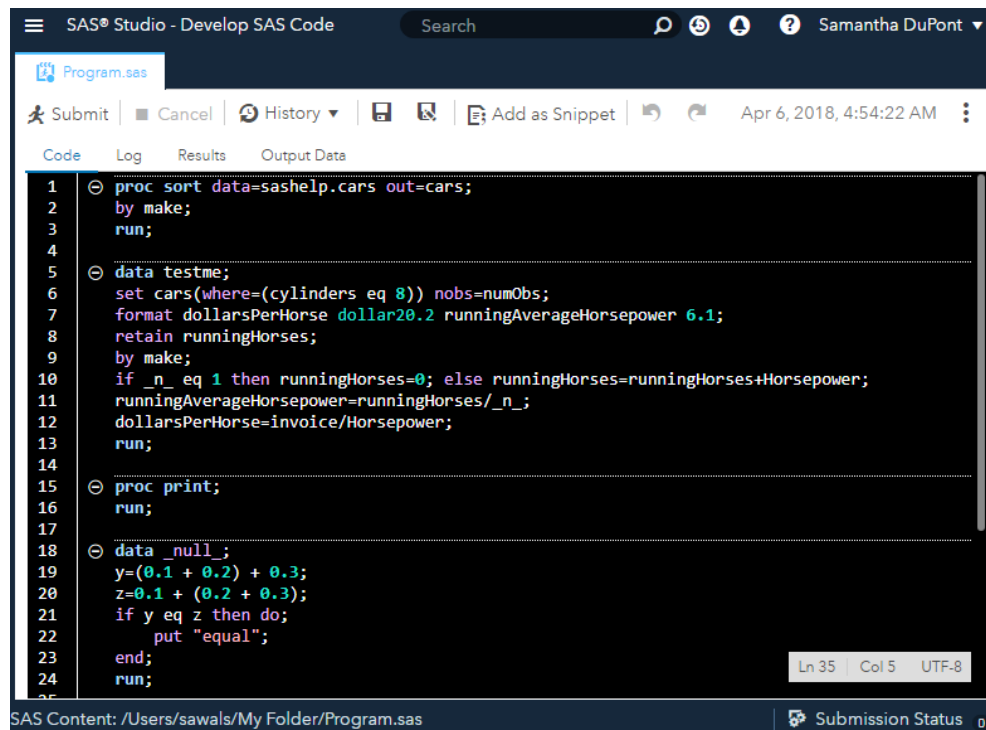
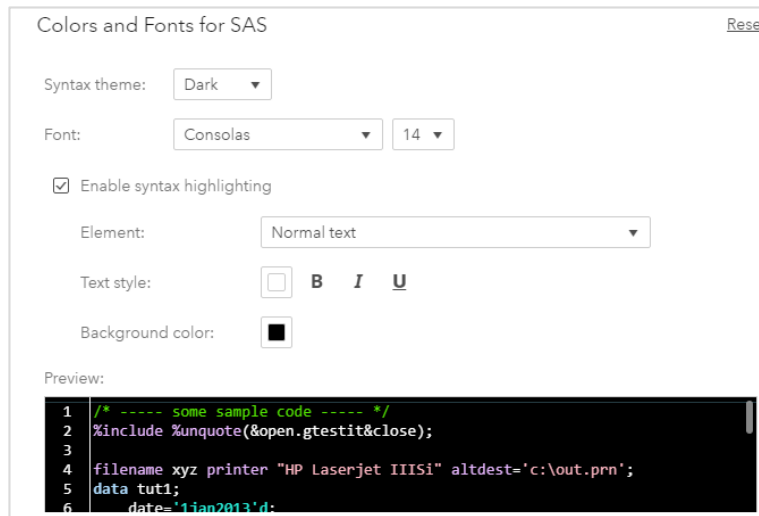
# What's Coming for SAS Studio

## Major release (5.x) planned for 2019

- Re-write of UI and mid-tier to take advantage of new technology and SAS standards
- High feature requests
  - Customize code editor appearance
  - Organize and search assets
  - Snippet abbreviations
  - Append log
  - Interactive perspective, improved



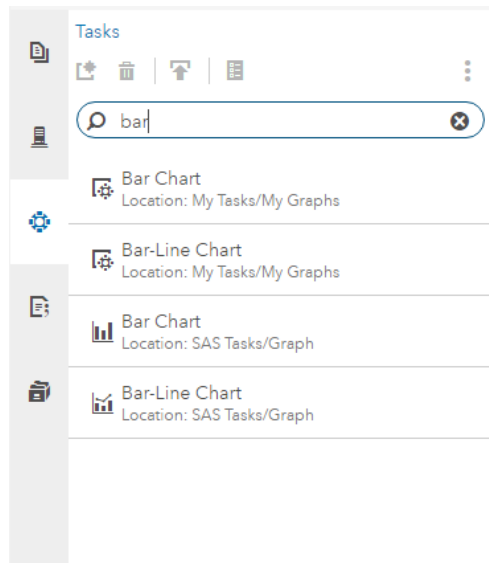
# Customize Editor Appearance & Behavior



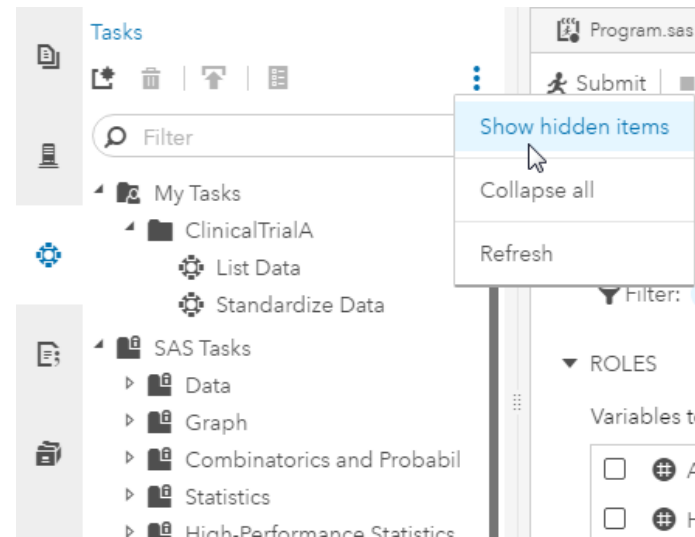
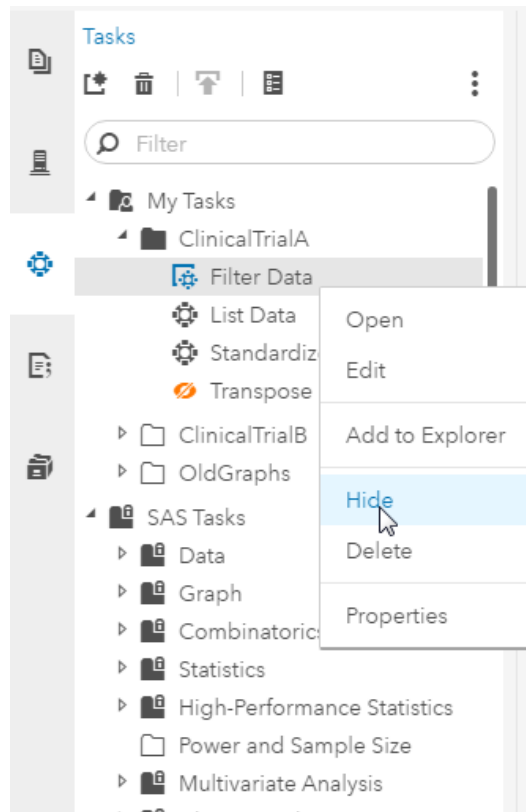


# Organization

## Filter Tasks and Snippets in Pane



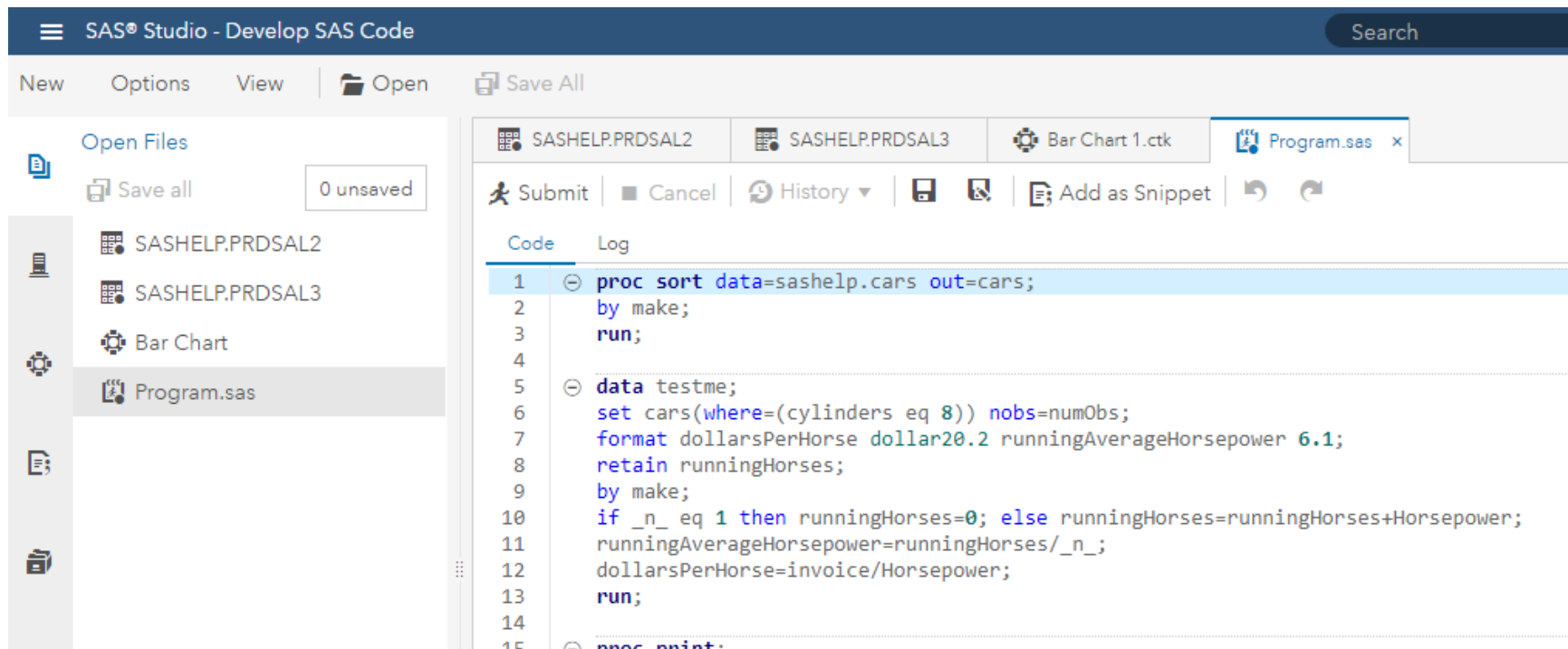
## Hide/Show Tasks and Snippets





# Organization

## View Open Tabs At-A-Glance



The screenshot displays the SAS Studio interface. The top bar shows 'SAS® Studio - Develop SAS Code' and a search bar. Below this is a menu bar with 'New', 'Options', 'View', 'Open', and 'Save All'. The left sidebar contains an 'Open Files' section with a 'Save all' button and a '0 unsaved' indicator. The file list includes 'SASHELP.PRDSAL2', 'SASHELP.PRDSAL3', 'Bar Chart', and 'Program.sas'. The main editor area shows the 'Program.sas' file with the following SAS code:

```
1 proc sort data=sashelp.cars out=cars;
2   by make;
3   run;
4
5 data testme;
6   set cars(where=(cylinders eq 8)) nobs=numObs;
7   format dollarsPerHorse dollar20.2 runningAverageHorsepower 6.1;
8   retain runningHorses;
9   by make;
10  if _n_ eq 1 then runningHorses=0; else runningHorses=runningHorses+Horsepower;
11  runningAverageHorsepower=runningHorses/_n_;
12  dollarsPerHorse=invoice/Horsepower;
13  run;
14
15 proc print;
```





# Snippet Abbreviations

## @ is the trigger

Properties

Name: \*

Score Header

Abbreviation:

@ sh

Define your abbreviation

TAB or ENTER inserts snippet

Submit Cancel History Add as Snippet

Code Log

1 @

Snippet Abbreviations

- bp
- bp
- dp
- sh

Preview snippet

```
/* SAS TEST
/* NAME: TESTSCOR
/* TITLE: SCORE DOCUMENTATION EXAMPLE 3
/* PRODUCT: STAT
/* SYSTEM: ALL
/* KEYS: SCORE
/* PROCS: SCORE PRINT
/* DATA:
/* SUPPORT:
/* REF:
/* MISC:
/* UPDATE:
/* ORSEP:
/* ORSEPPOWER;
```

Submit Cancel History Add as Snippet

Code Log

```
1 /******
2 /* SAS TEST
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4 /* NAME: TESTSCOR
5 /* TITLE: SCORE DOCUMENTATION EXAMPLE 3
6 /* PRODUCT: STAT
7 /* SYSTEM: ALL
8 /* KEYS: SCORE
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# Organization

## Improved Search

The screenshot displays the SAS Studio interface. The top window shows the 'SASHELP.CLASS' dataset with 5 columns and 19 rows. Below it, a search view is open, showing results for the search term 'class'. The search results table lists two files: 'CLASS' and 'CLASSFIT', both located in the 'SASHELP' library. A blue arrow originates from the 'CLASS' entry in the search results and points to the 'SASHELP.CLASS' tab in the main window, illustrating the 'Open files directly from the Search view' feature.

**SASHELP.CLASS Data Table:**

	Name	Sex	Age	Height	Weight
1	Alfred	M	14	69	112.5
2	Alice	F	13	56.5	84
3	Barbara	F	13	65.3	98
4	Carol	F	14	62.8	102.5

**Search Results Table:**

Name	Path	Modified	Size	Type
CLASS	SASHELP.CLASS	12/6/2017, 9:43:22 AM		Table
CLASSFIT	SASHELP.CLASSFIT	12/6/2017, 9:51:09		Table

Open files  
directly from the  
Search view



# Control How the Log Behaves

The screenshot shows the SAS Studio interface with the Log tab selected. The top toolbar contains buttons for Submit, Cancel, History, and a 'Clear log' button. The Log tab displays a list of messages, including notes about data sets SASHELP.CARS and WORK.CARS, and a code block with SAS code and its execution results. A 'Submission' timestamp is visible at the bottom.

Submit | Cancel | History | Add as Snippet | Clear log

Code Log Results Output Data

Errors (0) Warnings (0) Notes (16)

NOTE: There were 428 observations read from the data set SASHELP.CARS.  
NOTE: The data set WORK.CARS has 428 observations and 15 variables.  
NOTE: PROCEDURE SORT used (Total process time):  
NOTE: There were 87 observations read from the data set WORK.CARS.

real time 0.00 seconds  
cpu time 0.01 seconds

```
123  
124 data b;  
125 set sashelp.class;  
126 where sex eq "F";  
127 run;  
NOTE: There were 9 observations read from the data set SASHELP.CLASS.  
WHERE sex='F';  
NOTE: The data set WORK.B has 9 observations and 5 variables.  
NOTE: DATA statement used (Total process time):  
real time 0.00 seconds  
cpu time 0.00 seconds
```

128  
129 OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;  
140

Submission: Apr 6, 2018, 5:39:48 AM

```
1 OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;  
72  
73 OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
```

Append the log; clear at will

Timestamp – click to open the code, log, results, data for that submission





# Managing Your Session

## Submission Status

Click to open the code, log, results, data for that submission

Submission Status <span>×</span>					
<div>All   Errors   Warnings   Pending    Clear all    Cancel all</div>					
Status	Name	Type	Run Time	Submitted	Completed
✓	<a href="#">Program.sas</a>	Program	2s	4/6/2018, 5:39:42 AM	4/6/2018, 5:39:44 AM
✓	<a href="#">Program.sas</a>	Program	2s	4/6/2018, 5:39:48 AM	4/6/2018, 5:39:51 AM
✓	<a href="#">Program.sas</a>	Program	2s	4/6/2018, 5:39:53 AM	4/6/2018, 5:39:56 AM
✗	<a href="#">Program.sas</a>	Program	2s	4/6/2018, 5:46:08 AM	4/6/2018, 5:46:10 AM



# Interactive Perspective

## Append log and results, recall last submitted code

The screenshot displays the SAS Studio - Develop SAS Code interface. The top menu bar includes 'New', 'Options', 'View', 'Open', and 'Save All'. A search bar and user profile 'Samantha DuPont' are on the right. The left sidebar shows 'Open Files' with 'ProgramIML.sas' listed. The main editor window shows the code for 'ProgramIML.sas' with line numbers 1 through 9. The code is as follows:

```
1 proc iml;  
2   VarName="Sex";  
3   submit VarName;  
4  
5 proc freq data=Sashelp.Class;  
6   table &VarName / out=OutFreq;  
7   run;  
8  
9   endsubmit;
```

Below the code editor, the 'Log' and 'Results' tabs are visible. The 'Log' tab is active, showing a message: 'NOTE: IML Ready'. A context menu is open over the log, with options: 'Clear log', 'Clear results', 'Open in a browser tab', and 'Print'.





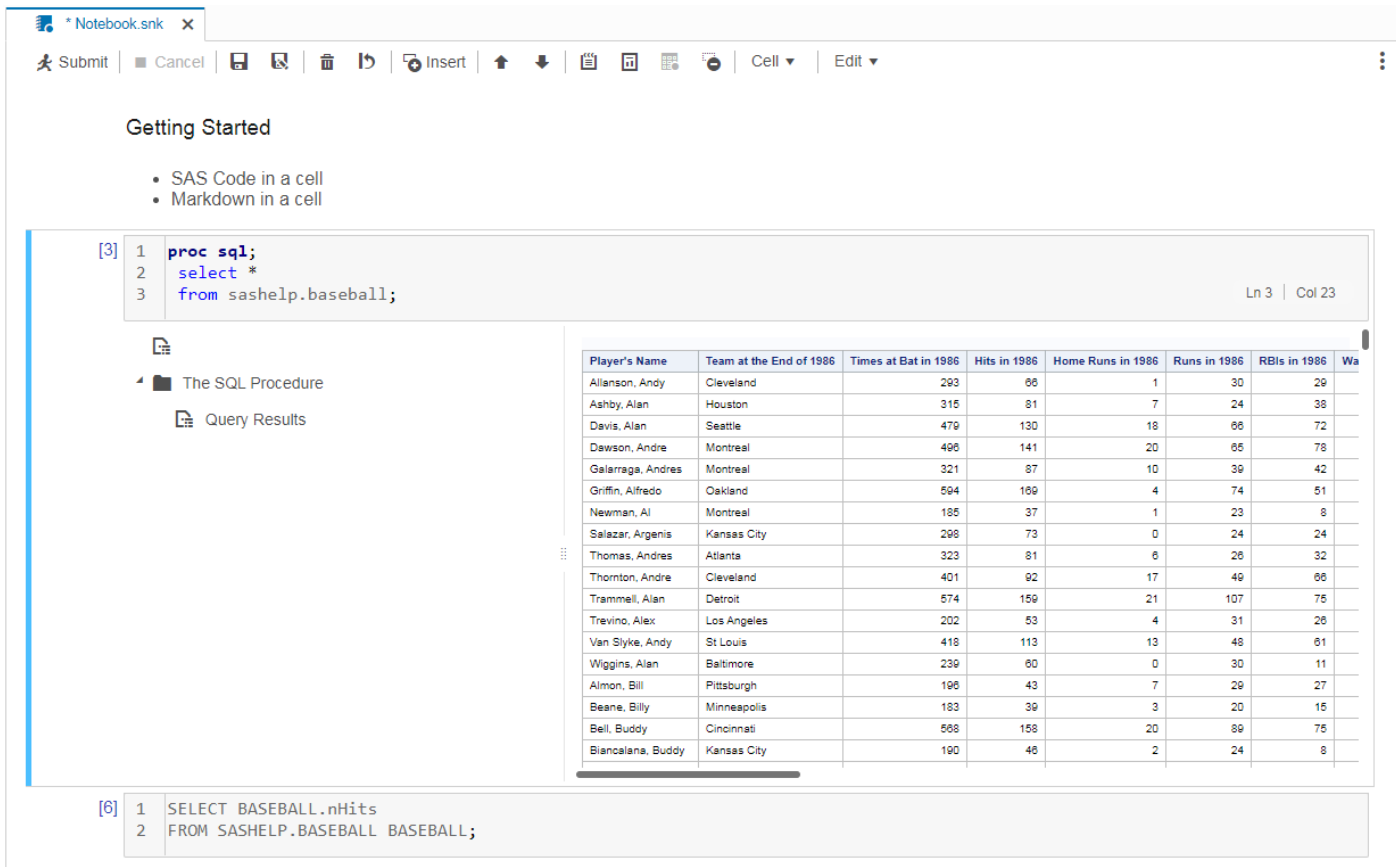
# Working with Tables

## Filter in-place

SASHELP.BASEBALL						
SASHELP.BASEBALL						
Columns: 24 of 24   Rows: 1 to 90 of 90 (filtered)						
nAtBat>500						
	Name	Team	nAtBat	nHits	nHome	nRuns
1	Griffin, Alfredo	Oakland	594	169	4	74
2	Trammell, Alan	Detroit	574	159	21	107
3	Bell, Buddy	Cincinnati	568	158	20	89
4	Buckner, Bill	Boston	629	168	18	73
5	Butler, Brett	Cleveland	587	163	4	92
6	Doran, Bill	Houston	550	152	6	92
7	Dwight, Brian	California				



# Notebooks in SAS Studio



The image shows a screenshot of the SAS Studio Notebook interface. At the top, there's a toolbar with icons for Submit, Cancel, Save, Print, Delete, Undo, Redo, Insert, and navigation arrows. Below the toolbar, the notebook title is '\* Notebook.snk'. The main content area is titled 'Getting Started' and contains a bulleted list: 'SAS Code in a cell' and 'Markdown in a cell'. Below this, there's a code cell labeled '[3]' containing SAS code: 'proc sql; select \* from sashelp.baseball;'. To the right of the code, it says 'Ln 3 | Col 23'. Below the code cell, there's a sidebar with a tree view showing 'The SQL Procedure' and 'Query Results'. The 'Query Results' section is expanded, showing a table of baseball statistics for 1986. The table has columns: Player's Name, Team at the End of 1986, Times at Bat in 1986, Hits in 1986, Home Runs in 1986, Runs in 1986, RBIs in 1986, and Wa. The table lists 20 players and their statistics.

Getting Started

- SAS Code in a cell
- Markdown in a cell

[3] 1 `proc sql;`  
2 `select *`  
3 `from sashelp.baseball;` Ln 3 | Col 23

The SQL Procedure

Query Results

Player's Name	Team at the End of 1986	Times at Bat in 1986	Hits in 1986	Home Runs in 1986	Runs in 1986	RBIs in 1986	Wa
Allanson, Andy	Cleveland	293	66	1	30	29	
Ashby, Alan	Houston	315	81	7	24	38	
Davis, Alan	Seattle	479	130	18	66	72	
Dawson, Andre	Montreal	496	141	20	65	78	
Galarraga, Andres	Montreal	321	87	10	39	42	
Griffin, Alfredo	Oakland	594	169	4	74	51	
Newman, Al	Montreal	185	37	1	23	8	
Salazar, Argenis	Kansas City	298	73	0	24	24	
Thomas, Andres	Atlanta	323	81	6	26	32	
Thornton, Andre	Cleveland	401	92	17	49	66	
Trammell, Alan	Detroit	574	159	21	107	75	
Trevino, Alex	Los Angeles	202	53	4	31	26	
Van Slyke, Andy	St Louis	418	113	13	48	61	
Wiggins, Alan	Baltimore	239	60	0	30	11	
Almon, Bill	Pittsburgh	196	43	7	29	27	
Beane, Billy	Minneapolis	183	39	3	20	15	
Bell, Buddy	Cincinnati	568	158	20	89	75	
Biancalana, Buddy	Kansas City	190	46	2	24	8	

[6] 1 `SELECT BASEBALL.nHits`  
2 `FROM SASHELP.BASEBALL;`



# More Features Planned

## Enhanced Query tool

- Expression builder for Where and Having
- More operators in Joins
- Calculated columns

Add Calculated Column

Filter

Selected Columns

- ZAIR

Tables

- ZAIR
  - AIR
  - SALARY
  - ACCOUNT
  - BUDGET
  - ACTUAL
  - DATE
  - QTR
  - DEPT
  - ACCOUNT

Calculated Columns

- Name of calc

Properties

Column name:  Length:

Column label:  Format:

Program.sas Query.cqy

Submit Cancel

Columns

Filter

Join 1

(t1) SASHELP.PRDSAL2 (t2) SASHELP.PRDSAL3

t1.COUNTRY t2.COUNTRY

= (Is equal to)  
≠ (Is not equal to)  
> (Is greater than)  
< (Is less than)  
≥ (Is greater than or equal to)  
≤ (Is less than or equal to)

Code Log

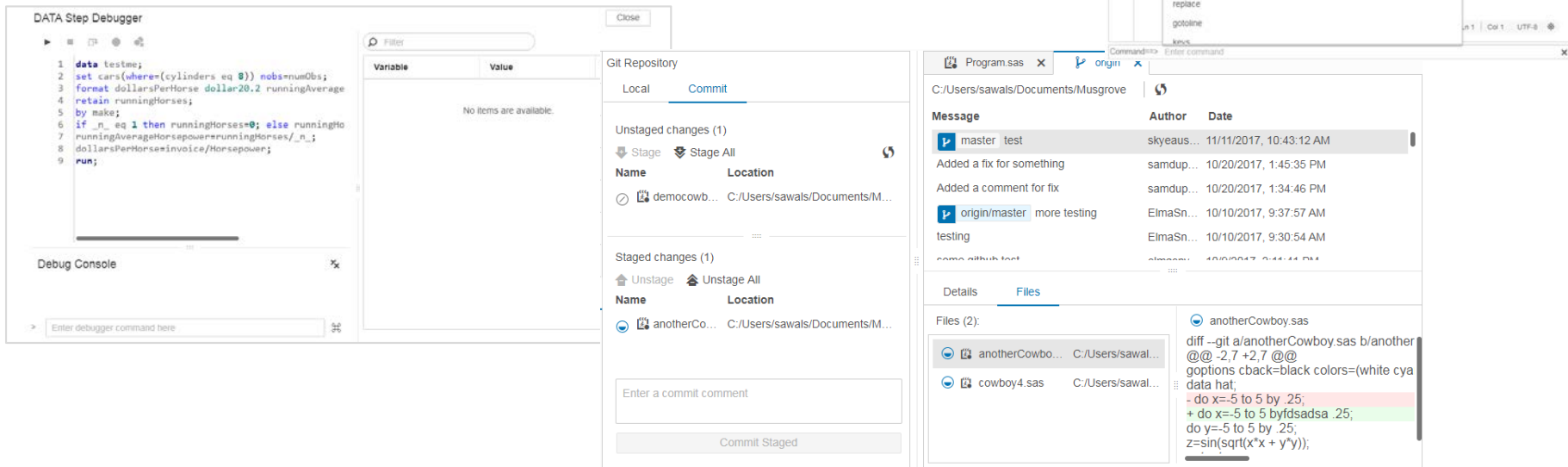
```
1 %web_drop_table(WORK, QUERY);  
2  
3 PROC SQL;  
4   CREATE TABLE WORK.QUERY AS  
5   SELECT  
6     t1.COUNTRY,  
7     t1.'STATE'n,  
8     t1.COUNTRY  
9   FROM
```

Read Only Ln 1 Col 1



# More Features Planned

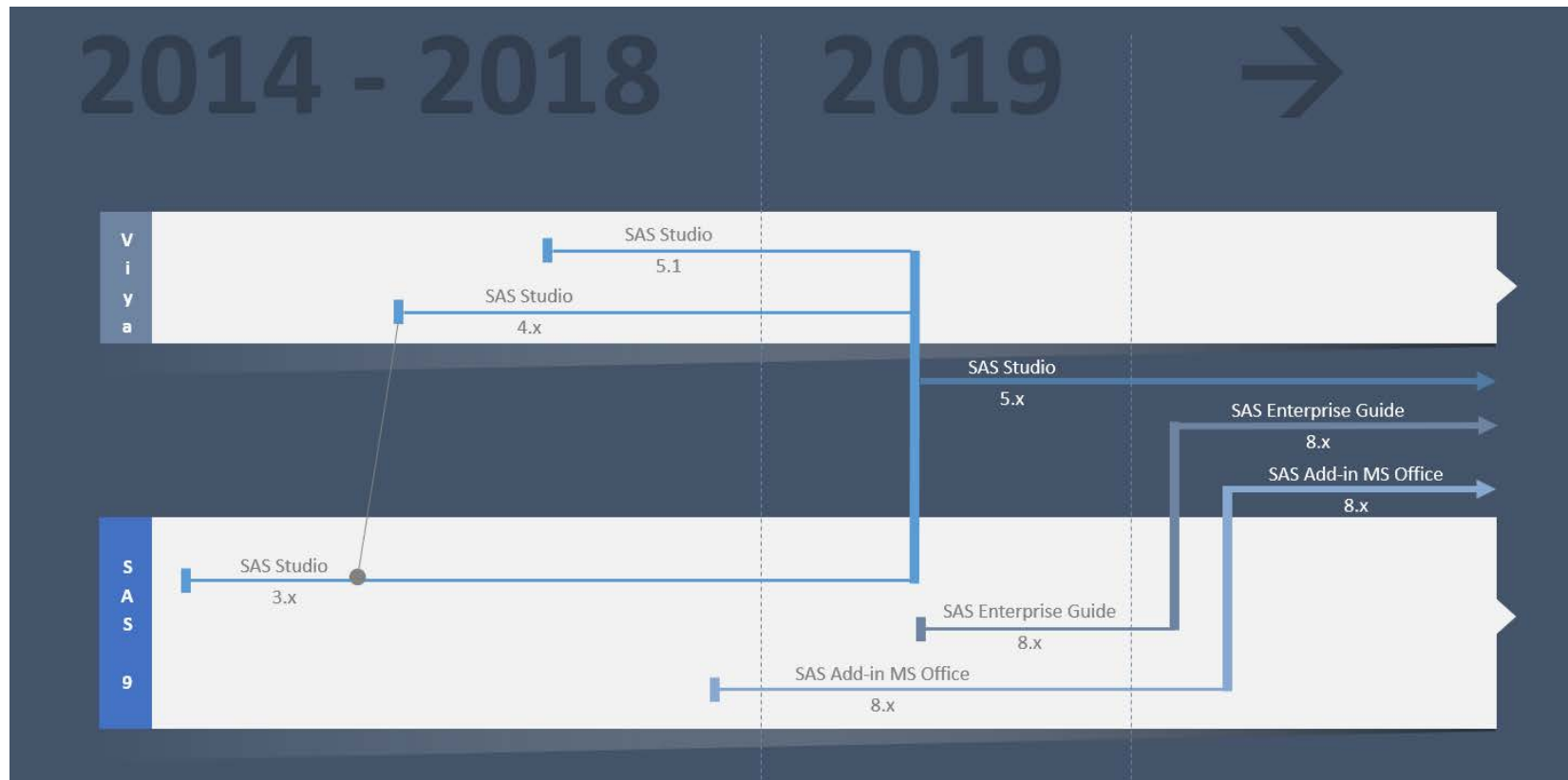
- DATA step debugger
- Integration with Git for source management
- Command Interface







# Roadmap





# Be a Part of the Discussion

## Connect with us on SAS Communities

- [SAS Studio community](#) – find it under SAS Programming
- [SAS Enterprise Guide community](#) – find it under Business Intelligence
- [SASware ballot ideas](#)

The screenshot shows the SAS Support Communities homepage. At the top, the SAS logo is followed by the tagline 'THE POWER TO KNOW'. Navigation links include 'Products & Solutions', 'Industries', 'Support', 'Learn', 'Partners', 'Connect', and 'About SAS'. A 'Communities' button is highlighted. The main banner area says 'Welcome to SAS Support Communities' and includes a 'Join Now' button. Below the banner is a search bar with a 'Community' dropdown and a 'Search' button. A 'Find a Community' button is also present. The 'Latest Activity' section shows a list of posts with details like title, location, author, views, and likes. On the right, there are statistics for members, online users, and posts, along with a 'Post a Question' button.

Featured Posts	Popular Posts	Unanswered Questions
<b>Code Like It Matters: Best Practices from Software Engineering, Applied to SAS Programming</b> In: SAS Communities Library   Latest Post by: paulkaefer	1847 Views	10 Likes
<b>Fun with SAS Visual Analytics Graphics: Challenge accepted!</b> In: SAS Visual Analytics   Latest Post by: Rensho_sas	2111 Views	9 Likes
<b>Concatenate function using underlying/assigned format</b> In: SASware Ballot Ideas   Latest Post by: Reza	125 Views	7 Likes
<b>Re: SAS problem solving skill</b> In: General SAS Programming   Latest Post by: Reza	314 Views	7 Likes
<b>Enhanced RENAME syntax to handle variable lists</b> In: SASware Ballot Ideas   Latest Post by: Reza	224 Views	11 Likes

MEMBERS: 149,288  
ONLINE: 341  
POSTS: 381,515

Post a Question