

# SAS Club 2023

Der Business Analytics Club für SAS User

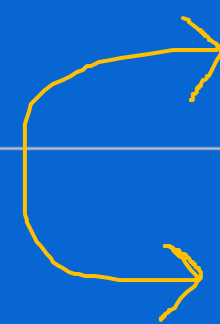
Wien, SAS Office Trabrennstraße  
19. Oktober 2023

Gerhard Svolba, Phillip Manschek, Jens-Ole Harden,  
Michael Weberberger (Premedia), Florian Stammer



# Agenda

14:15 - 14:20 Uhr	Begrüßung / Intro / News Gerhard Svolba, SAS
14:20 - 14:50 Uhr	Es geht auch anders! - Erstellung analytischer Modelle mit SAS Viya Gerhard Svolba, SAS
14:50 - 15:20 Uhr	SAS und Generative AI - Überblick, Entwicklungen und Anwendungsbeispiele aus dem Marketing Michael Weberberger, Premedia // Florian Stammer & Gerhard Svolba, SAS
15:20 - 15:35 Uhr	Die SAS Explore Konferenz in Las Vegas - Ein Vor-Ort Bericht Gerhard Svolba, SAS
15:35 - 15:55 Uhr	PAUSE
15:55 - 16:25 Uhr	Fuzzy Matching von Steuernummern in externen Datenquellen mit SAS Mihai Paunescu, Bundesministerium für Finanzen
16:25 - 16:50 Uhr	SAS Studio Analyst und die Erweiterungsmöglichkeiten mit Custom Steps Phillip Manschek, SAS
16:50 - 17:15 Uhr	SAS Tipps und Tricks Session Jens Ole Harden, SAS
ab 17:15 Uhr	Gemütliches Get-Together mit Buffet



# SAS Studio Analyst und die Erweiterungsmöglichkeiten mit Custom Steps

Phillip Manschek, SAS



# Agenda





# SAS Studio - Kernidee

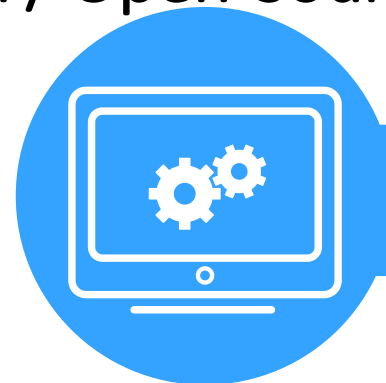
SAS Enterprise Guide



SAS DI Studio



SAS Display Manager /  
Python / Open-Source

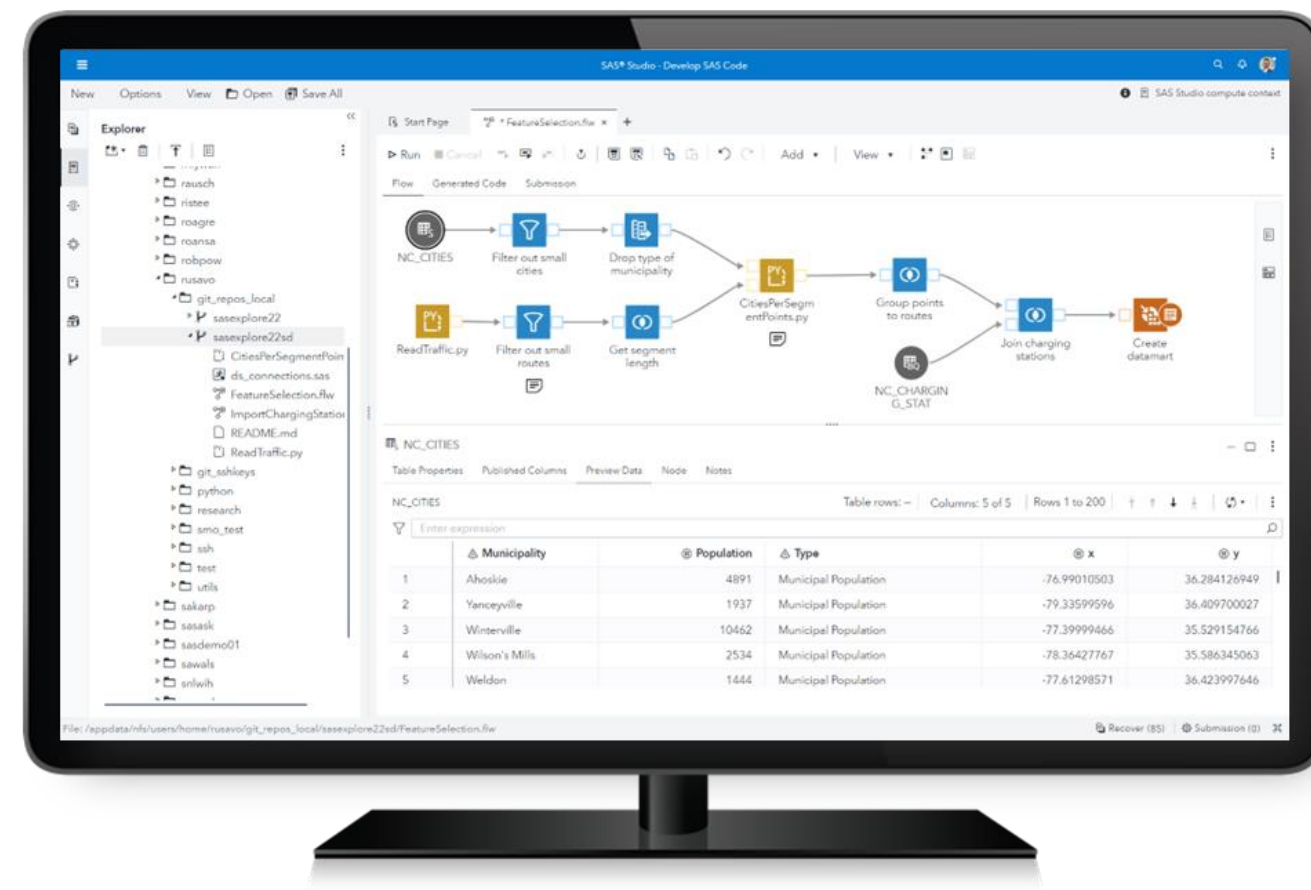


## SAS Studio



- Ein zentrales Web-Interface für alle Daten-Pipelines
- Vereinfachte Zusammenarbeit von Analysten, Data Scientists und Data Engineers
- Vollintegriert in das Daten- und Entwicklungssystem (Lineage, Git, Erweiterungsmöglichkeiten, Scheduling, ...)

# SAS Viya Integrated Development Environment



**Access 80+ On-prem and Cloud data sources**



**Use SAS & Python to get the best from both**



**Build Flows – single pane of glass of your data pipelines**



**Create your own transformations with Custom Steps**



**Collaborate and enable CI/CD with Git integration**



**Leverage advanced Orchestration & Scheduling**

# SAS Studio

Anwendungsgebiete

**Cloud first  
Strategie**



# SAS Studio

Anwendungsgebiete



**Cloud first  
Strategie**

**Kombination  
von  
Sprachen**

# SAS Studio

Anwendungsgebiete

**Cloud first  
Strategie**

**Erweiterbarkeit  
“data apps”**

**Kombination  
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# SAS Studio

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Sprachen**

**ETL**

# SAS Studio

Anwendungsgebiete

**Cloud first  
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**Erweiterbarkeit  
“data apps”**

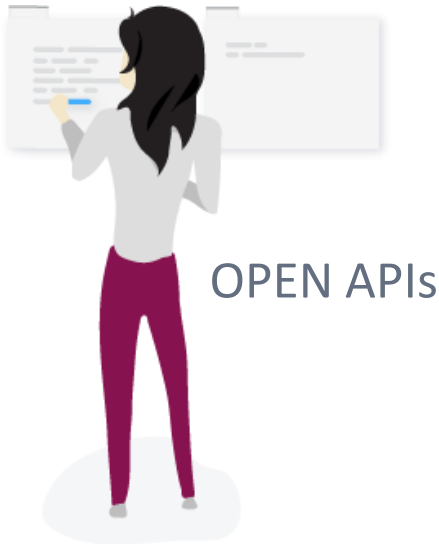
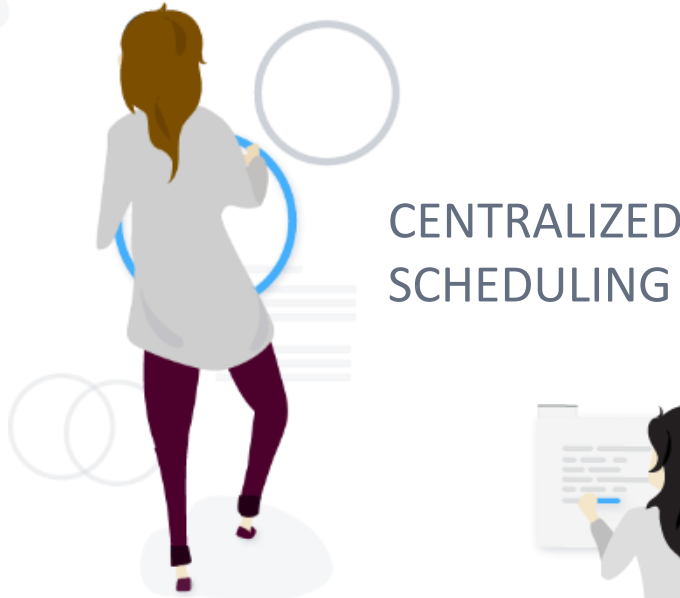
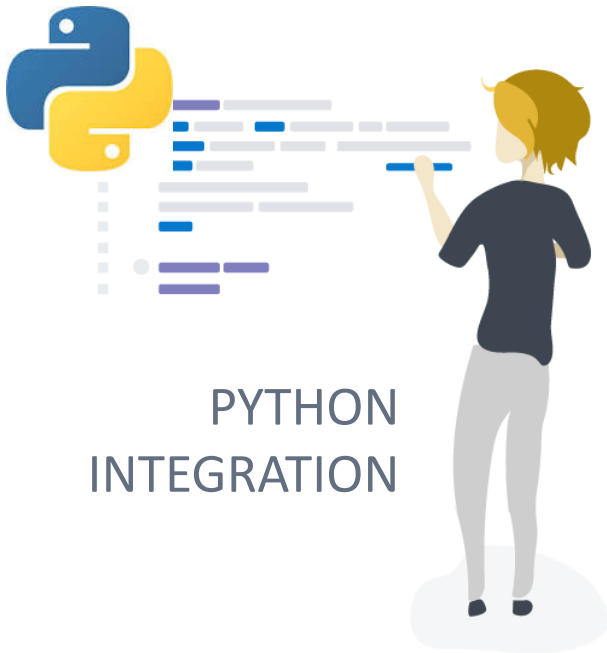
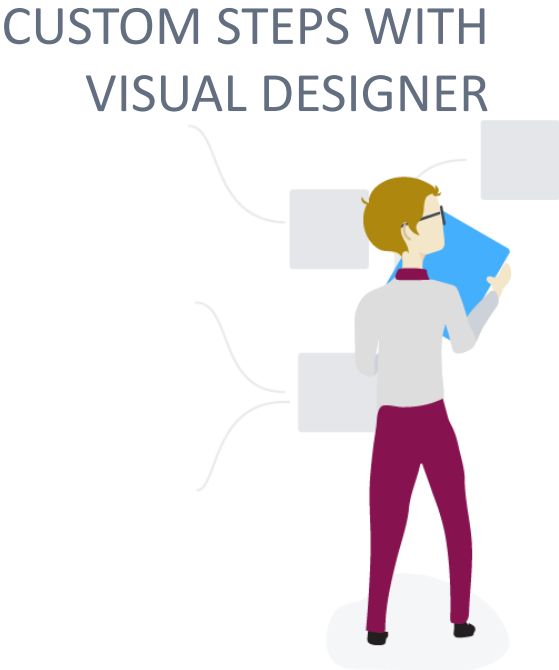
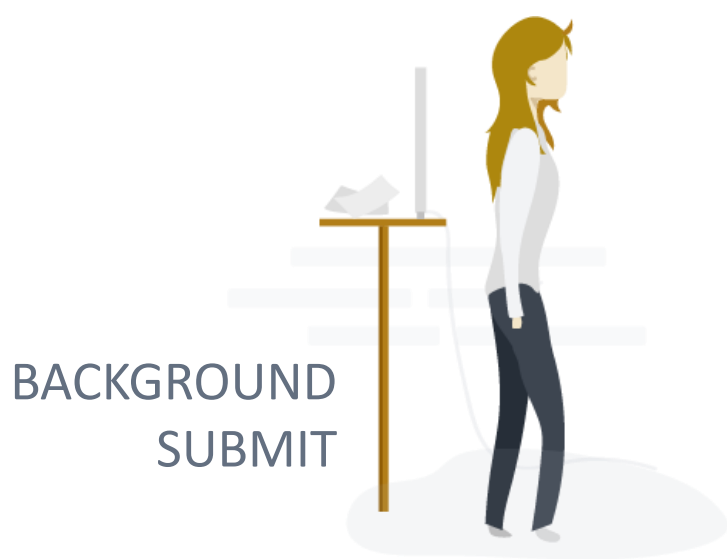
**Geänderte  
Arbeitsweisen**

**Kombination  
von  
Sprachen**

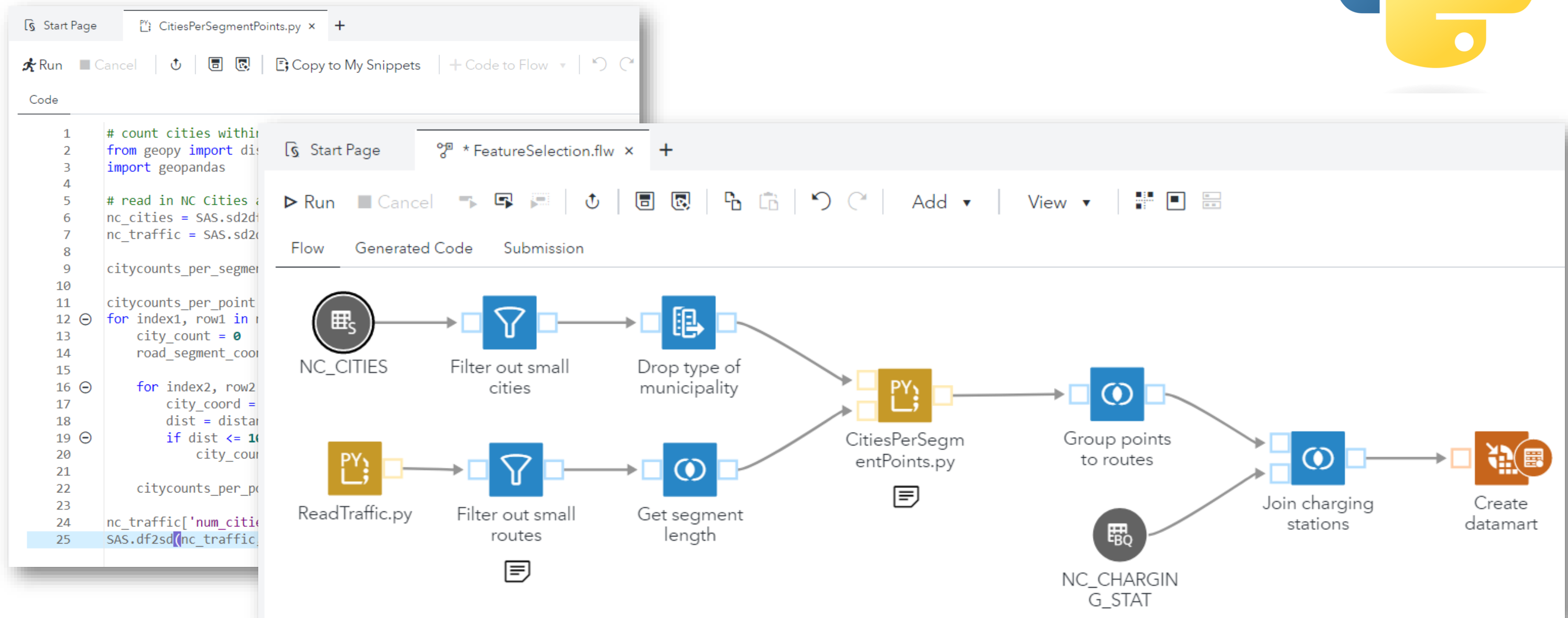
**ETL**



# What's new in Studio vs EG/DI



# SAS Studio – Python integration



# SAS Studio – Git integration



New Options View Open Save All

Git Repositories

Clone Add

Current Repo...

- sasdemo
  - ✓ dev
  - prod
  - main
- Other Repositories
  - sasexplore22
  - sasexplore22sd

sasdemo x ascii\_tree.sas +

sasdemo Current repository | dev Current branch | Pull dev Last pulled: Jun ... | Push dev Last pushed: Jun 20...

Commit History

Unstaged Changes (1)

- README.md

Staged Changes (1)

- demo/ascii\_tree.sas

Enter a commit comment

Commit

diff --git a/demo/ascii\_tree.sas b/demo/ascii\_tree.sas index c753...  
@@ -1,9 +1,9 @@  
-%let tree\_width=22;  
+%let tree\_width=12;  
data \_null\_;  
put @&tree\_width '@';  
-do i=0 to 21;  
+do i=0 to 11;  
b=substr(repeat('\*0',i),1,2\*i+1);  
put @(&tree\_width-i) b;  
end;

sasdemo (0) (2)

Recover (94) Submission (0)

Search or jump to... Pull requests Issues

avoio / sasdemo Private

Code Issues Pull requests Actions Projects

smaller

dev

avoio committed on Aug 1

Showing 1 changed file with 2 additions and 2 deletions.

4 demo/ascii\_tree.sas

...	...	@@ -1,9 +1,9 @@
1	-	%let tree_width=22;
	1	+ %let tree_width=12;
2	2	
3	3	data _null_;
4	4	put @&tree_width '@';
5	5	
6	-	do i=0 to 21;
	6	+ do i=0 to 11;
7	7	b=substr(repeat('*0',i),1,2*i+1);
8	8	put @(&tree_width-i) b;
9	9	end;



# SAS Studio – Deployment als job

The screenshot displays the SAS Studio interface. On the left, the Explorer pane shows the file structure, with 'rankflow.flw' selected under the 'Public' folder. A context menu is open over 'rankflow.flw', highlighting the 'Deploy as a job' option. The main workspace shows a flow diagram with steps: CLASS, Query, RESULT\_VIEW, Rank Data, and DEMO\_RANK. The 'Jobs and Flows' panel on the right shows a list of jobs, with 'rankflow\_job\_1' and 'rankflow\_job\_2' highlighted.

**Jobs and Flows**

Monitoring Scheduling

Jobs and Flows (28)

Search Name

Name	Scheduled
bot to crawl CATALOG_REGRE...	
COMMON_PROD	
Load metadata into the Inform...	
Program_Baseline	
rankflow_job_1	
rankflow_job_2	
Rebuild Catalog index "codefil...	
Rebuild Catalog index "dataflo...	

# SAS Studio - API

New open API endpoint for Code Generation for Flows and Programs

## SAS Studio Development

SAS Studio API

[Endpoints](#) [Details](#) [Authentication](#) [Usage Notes](#) [Error Codes](#)

### Root

**Gets the API object** [Get](#)

The API object contains a set of links for the supported endpoints.

### CodeGeneration

**Generates code for an item at the given location** [Post](#)

Given the location of a SAS program or the Studio flow file, return the code that SAS Studio would run.

## Request Samples

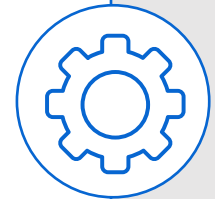
Code Samples

Payload

Python ▼

```
1 import requests
2
3 url = "http://example.com/studioDevelopment/code"
4
5 payload = {
6     "reference": {
7         "type": "content",
8         "path": "string",
9         "mediaType": "application/vnd.sas.dataflow"
10    },
11    "initCode": True,
12    "wrapperCode": True
13 }
14 headers = {
15     "accept": "application/vnd.sas.publish.code.generation.result",
16     "authorization": "Bearer <access-token-goes-here>",
17     "content-type": "application/json"
18 }
19
20 response = requests.post(url, json=payload, headers=headers)
21
22 print(response.text)
```

# SAS Studio – laufend neue Steps



## Transform Data

- Transpose Data
- Union Rows
- Rank Data
- Select Random Sample



## Visualize

- Bar Chart
- Line Chart, Bar-Line Chart
- Box Plot
- Scatter Plot



## Refine & Enrich

- Mask Data
- Remove Duplicates
- Geocode Data
- Verify with Loqate



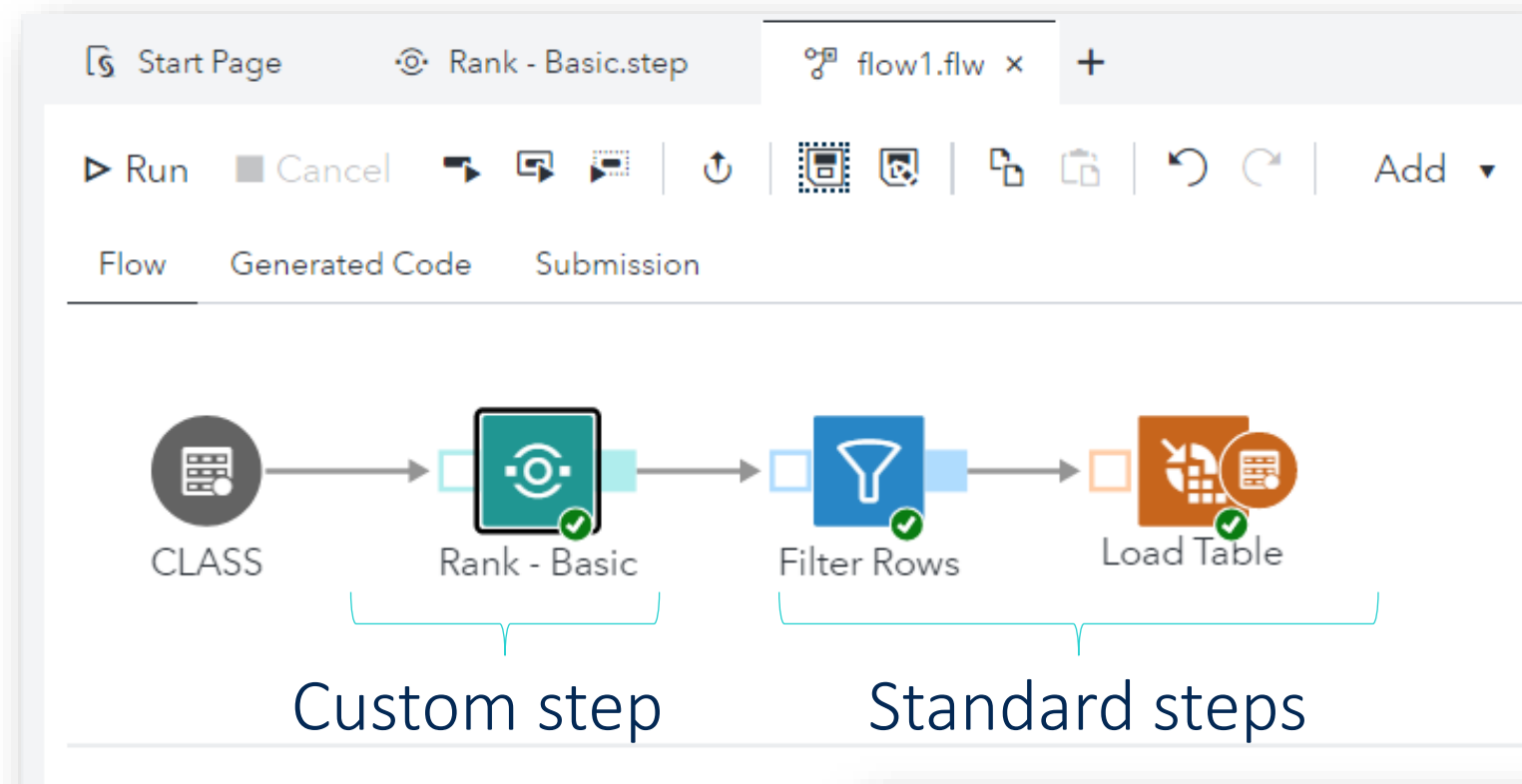
## Run Statistics

- Summary Statistics
- One-Way Frequencies
- Table Analysis
- Distribution Analysis

# Agenda



# Design your own Steps with “Custom Steps”



Rank - Basic

Rank Options Node Notes

Select a column to rank: \*

⊕ Age

☐ Create a new column for the ranked column

Rank - Advanced.step

Designer Prompt UI Program

Control Library

- + Add Page
- Rank Options
- Filter controls
- COMMON
  - Check Box
  - Color Picker
  - Date and Time Picker
  - Drop-down List
  - File or Folder Selec...
  - List
  - Numeric Stepper
  - Radio Button Group

Select an input table: SASHELP.CLASS

Select columns to rank: \*

⊕ Add numeric column(s)

Select how to handle tied values: \*

Mean

Specify the output table: \*

☒ Create new columns for each of the ranked columns

Properties: Input Table

ID: \*

inTable

Label:

Select an input table:

☒ Required

☒ Make control read-only

☒ Hide control at runtime

Default library: \*

SASHELP

Default table: \*

CLASS

Placeholder text:

1 Date Picker Control

2 Color Picker Control

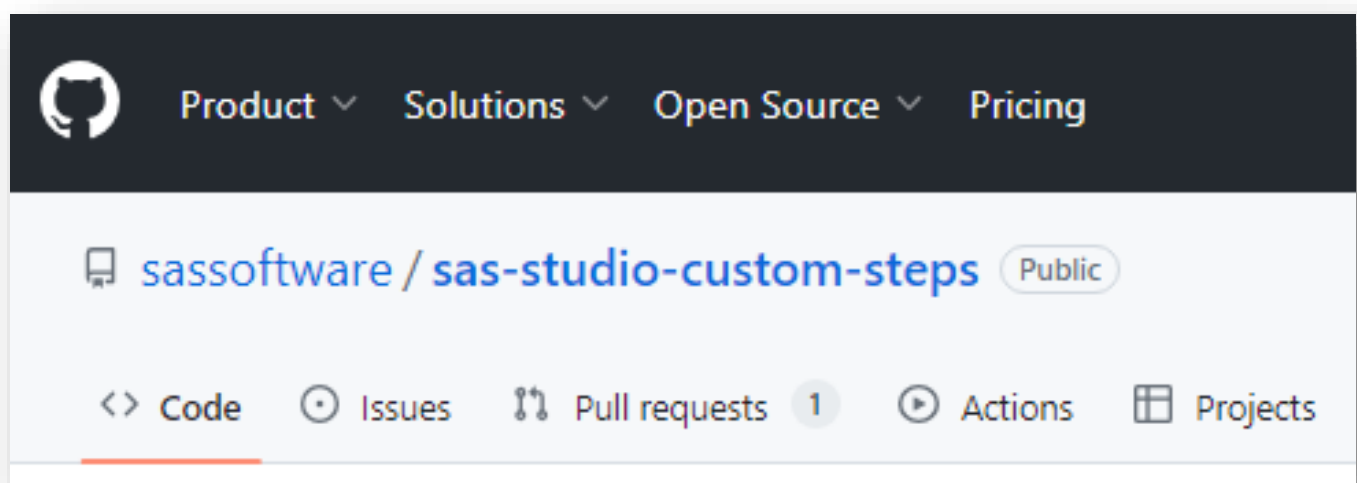
3 Read-only & hidden table/column selector controls

4 Column exclusion

5 Versioning with Git

# Enjoy the work from the community!

[sas-studio-custom-steps](#) GitHub repository



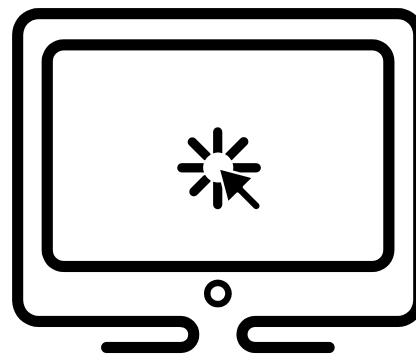
New steps



Contributors

Import - ADLS File Reader	Added missing version update to Custom Step About tab	3 months ago
Import - Data Ingestion Auto Pilot DI...	Update README.md	last month
Import - Extract Table from PDF	changing to accomodate Wilbram's feedback, take 2	4 months ago
Import - Google Sheets	Implement Feedback	6 months ago
Import - HTML Table	Update Import - HTML Table.step	last month
Lookup	Merge branch 'main' of github.com:torbenjuul/sas-studio-custom-steps	last year
NLP - Extract Rule Configuration	NLP - Extract Rule Configuration: minor code cleanup	3 weeks ago
NLP - Identify Language	NLP - Identify Language : reference to CAS action	6 months ago
NLP - Predefined Sentiment Analysis	WH feedback - minor correction	4 months ago
NLP - Profile Text	Renamed NLP - Profile Text folder name plus minor edits	6 months ago
NLP - Score Text Classifier	Post WH Friday Feedback	5 months ago
NLP - Train Text Classifier	Post WH Friday Feedback	5 months ago
Python Virtual environments	Renamed as per standard	10 months ago
R Runner	Update README.md	5 days ago
Rank Columns - Starter template	First Public Release to Public	last year
SCD Loader	Cleaned up code i SCD Loader	last year
Send SMTP Email	updated code to clear macro	4 months ago
Send Teams Message	Add Changes to README	2 months ago
Surrogate Key Generator	Spelling	last year
Synthetic Data Generation	PR #80 bullet formatting	last week

# Download Individual Custom Step



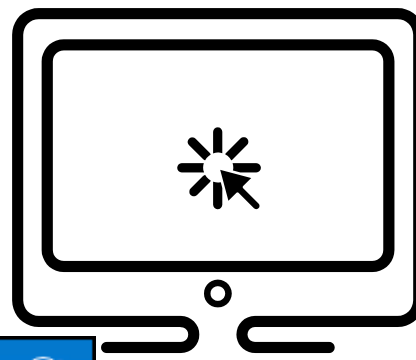
The screenshot shows the GitHub interface for the repository `sassoftware / sas-studio-custom-steps`. The file `GeoDistance with Rounding / GeoDistance with Rounding.step` is selected. The file's content is displayed as a JSON object:

```
1 {"creationTimeStamp":"2022-09-29T15:13:54.199Z","modifiedTimeStamp":"2022-09-29T15:56:49.025Z","createdBy":"maquee","modifiedBy":"maquee","name":"GeoDistance with Rounding"}
```

A blue callout box with the text "Click to download the .step file" points to the download icon (a square with a downward arrow) in the file's toolbar.



# Upload a Custom Step



The screenshot shows the SAS Studio interface. The top bar is blue with the text "SAS® Studio - Develop Code and Flows". Below the bar is a menu bar with "New", "Options", "View", "Open", and "Save All". The left pane is the "Explorer" pane, which is open to the "SAS Explore 2023" folder. A context menu is open over the "SAS Explore 2023" folder, showing options like "Collapse all", "Sort by", "New folder", "Add shortcut", "Insert as path", "Search in", "Rename", "Delete", "Move to", "Copy to", "Upload files", "Refresh", and "Properties". The "Upload files" option is highlighted with a yellow box. A blue callout box with the text "Click to upload the .step file" points to the "Upload files" option. The main workspace area shows a "Let's get to work!" message and a list of actions: "Program in SAS", "Build a flow", "Import data", and "Query data".

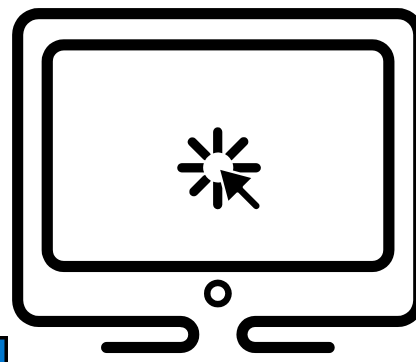
Let's get to work!  
Get started with a new program, flow, or query your data.

- Program in SAS
- Build a flow
- Import data
- Query data

Click to upload the .step file



# Preview Custom Step in Designer

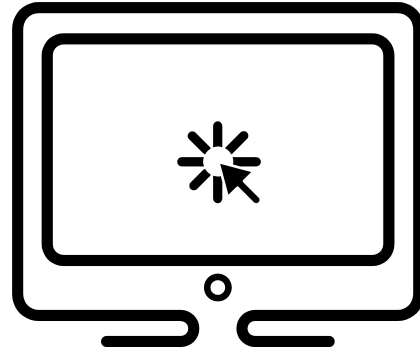


The screenshot displays the SAS Studio interface for developing code and flows. The top menu bar includes 'New', 'Options', 'View', 'Open', and 'Save All'. The left pane shows the 'Steps' list with 'GeoDistance with Rounding' selected. A context menu is open over this step, with 'Edit in Designer' highlighted. The main workspace shows the 'Calculate Geo Distance' step in the Designer view, with tabs for 'Calculate Geo Distance', 'Options', and 'About'. The 'Calculate Geo Distance' tab is active, showing configuration options like 'Input table', 'Calculate distance in' (Kilometers/Miles), and 'Lat/Long Columns'. The 'Preview' button is located in the top right corner of the step's configuration area.

Click to Edit  
in Designer  
the selected  
custom step

Click to  
Preview the  
custom step

# Run a Custom Step in Stand-Alone Mode



SAS Studio - Develop Code and Flows

Steps

- Anonymous and Mask Data
- GeoDistance with Rounding**
- Send SMTP Email

Run Cancel

Calculate Geo Distance Options About

Input table \*  
SASDM.LATLONG

Calculate distance in:  
☐ Kilometers  
☒ Miles

Lat/Long Columns

Location 1 \*  
☐ country\_latitude  
☐ country\_longitude

Location 2 \*  
☐ location\_latitude  
☐ location\_longitude

Output table \*  
SASDM.DISTANCE

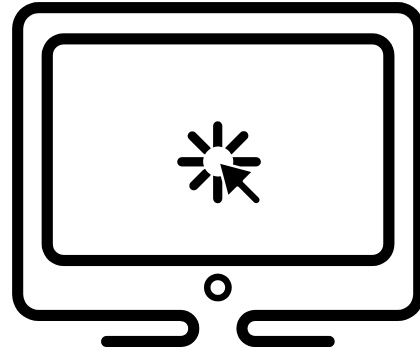
Output Data (1)

DISTANCE Table rows: 37 Columns: 7 of 7 Rows 1 to 37

	location_longitude	distance_in_Miles
1	-78.755821	4174.58
2	-78.755821	7316.92
3	-78.755821	8394.2
4	-78.755821	5198.59
5	-78.755821	6866.21
6	-78.755821	837.53
7	-78.755821	1415.75
8	-78.755821	1906.78
9	-78.755821	4354.56
10	-78.755821	4978.34
11	-78.755821	4509.83
12	-78.755821	7534.18
13	-78.755821	6143.1
14	-78.755821	3822.74
15	-78.755821	1493.47
16	-78.755821	4707.58
17	-78.755821	6871.55
18	-78.755821	9093.05
19	-78.755821	4184.11
20	-78.755821	4653.22

Click to Open  
in a tab the  
selected  
custom step

# Use Custom Steps in a SAS® Studio Flow



SAS Studio - Develop Code and Flows

New Options View Open Save All

SAS Studio compute context

Steps

Type to filter list

SAS Steps Shared

- Anonymize and Mask Data
- GeoDistance with Rounding
- Send SMTP Email

Calculate Distance.flw

Run Cancel

Flow Generated Code Submitted Code and Results

Calculate GeoDistance

LATLONG GeoDistance with Rounding DISTANCE

Send Email

Send SMTP Email

Send SMTP Email

Email Message Information Options Email Setup About Node Notes

Refresh Edit

From: systeminfo@sas.com

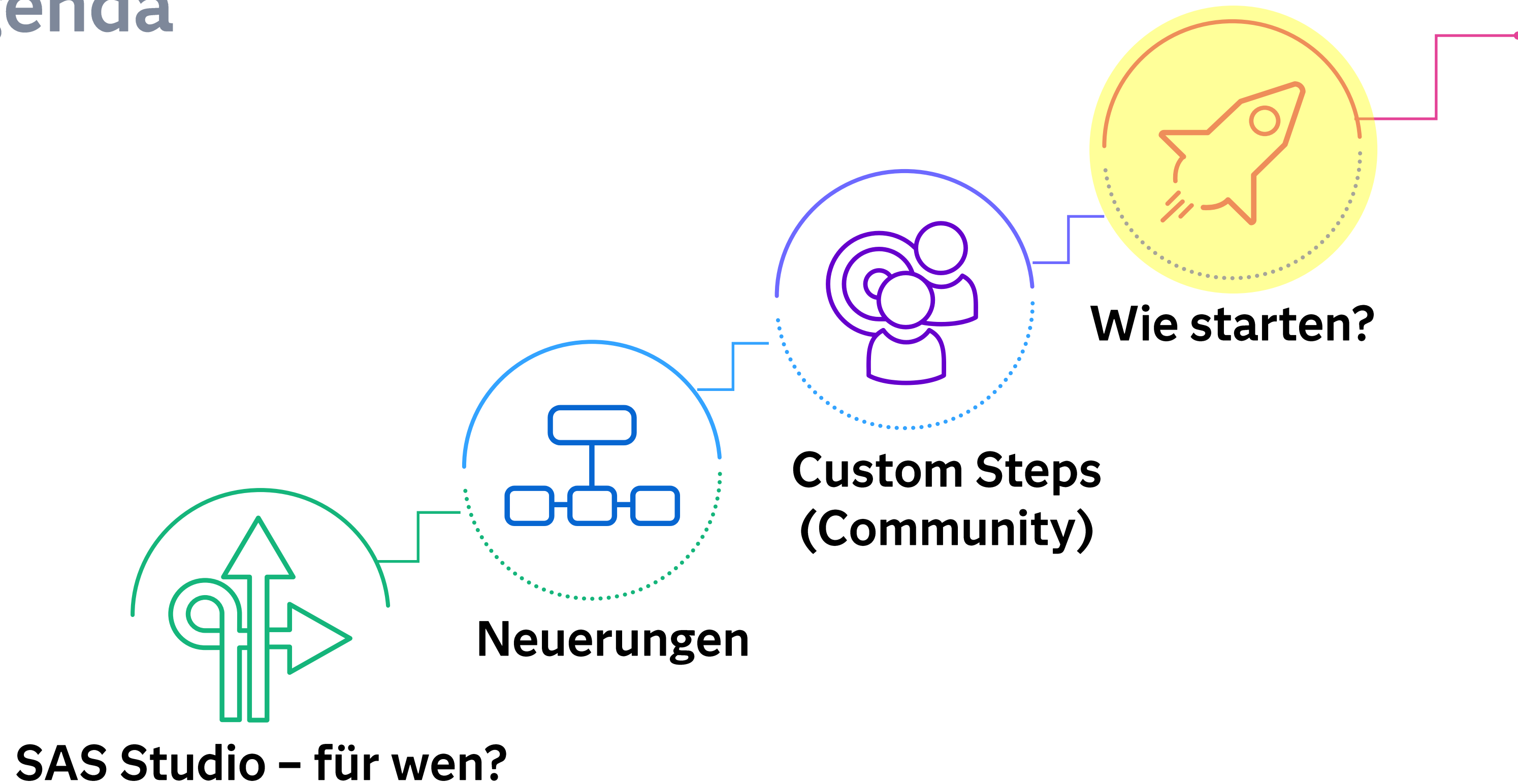
To: \* marykathryn.queen@sas.com

> Copy recipients

Subject: \* Distance Table is Ready for Viewing

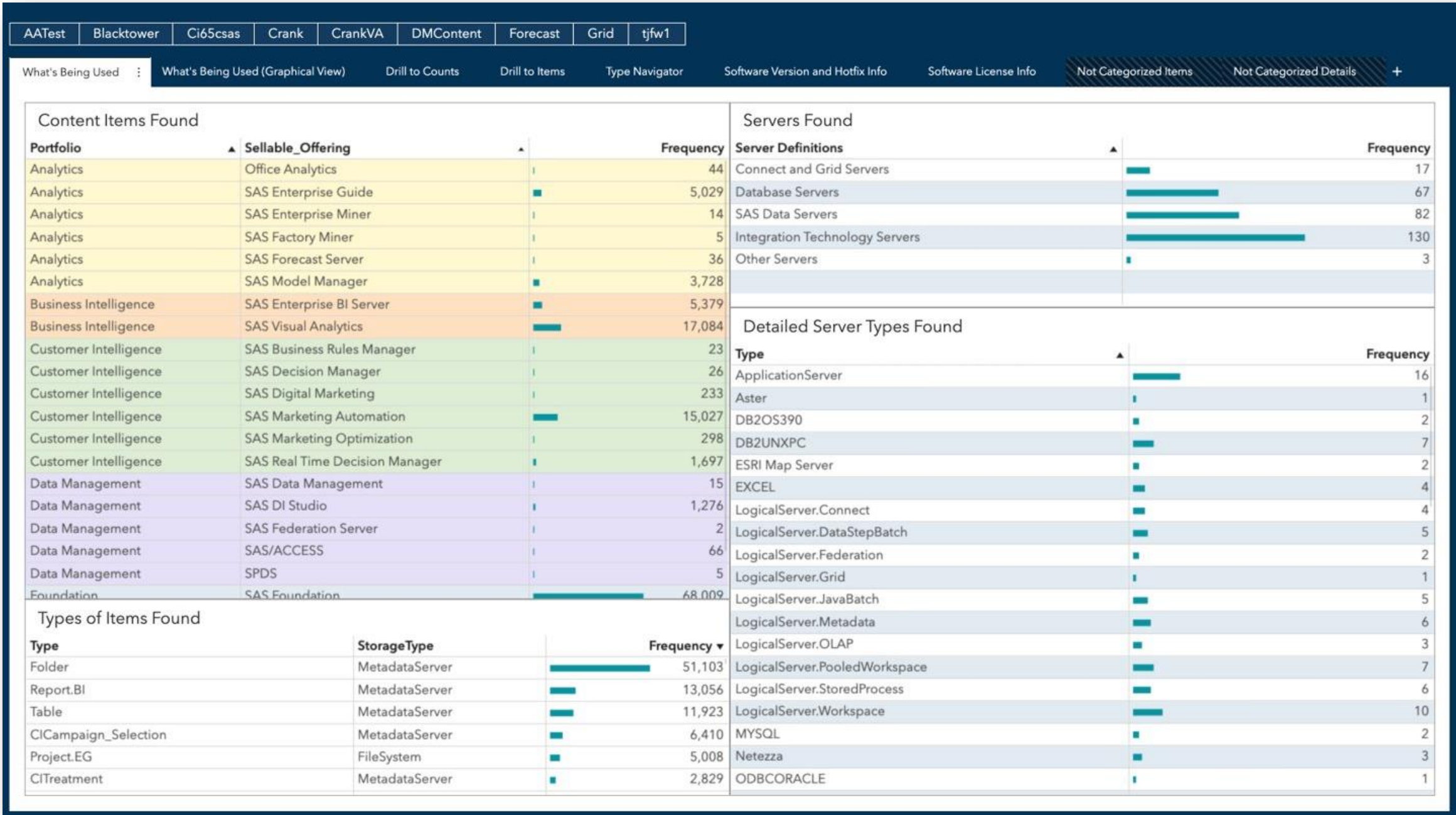
Body: \* The calculated distance table is ready for viewing in the SASDM library!

# Agenda



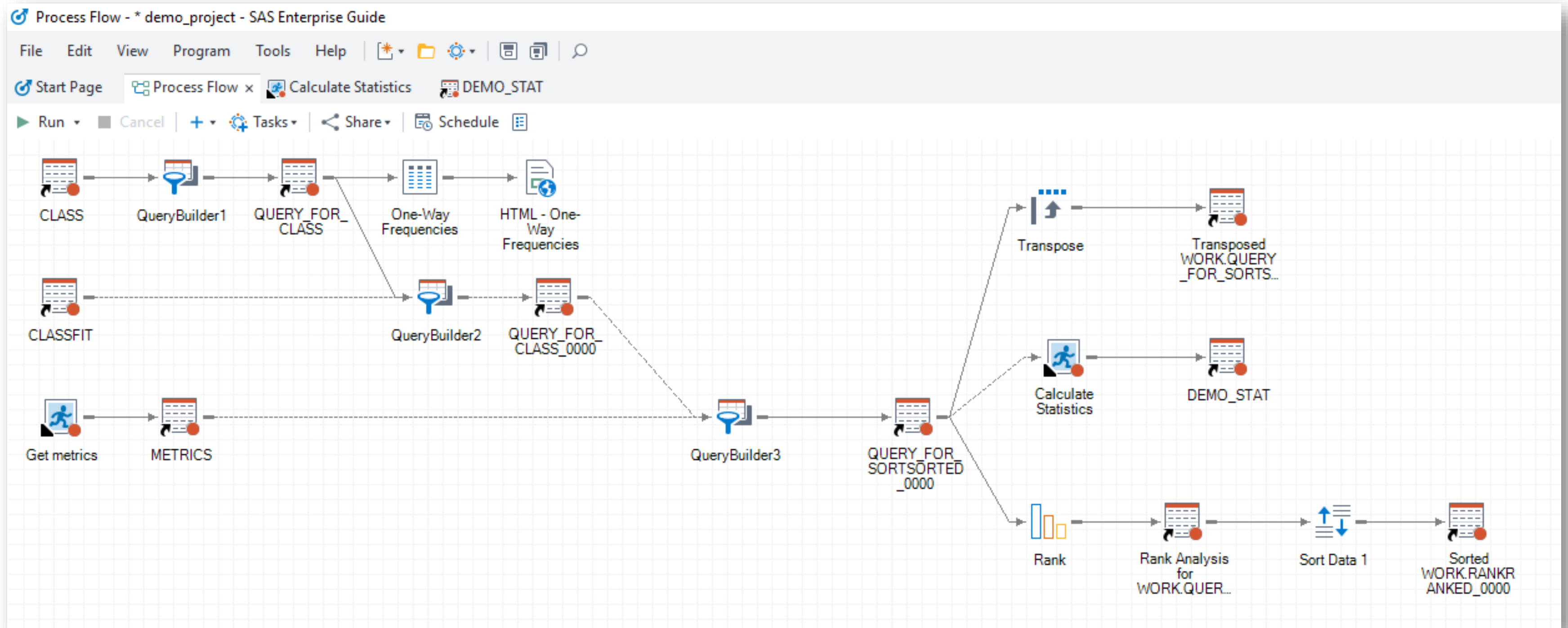
# SAS 9 Content Assessment

A collection of applications to estimate the state and readiness of SAS 9 system for migration



# Automated migration

## Export

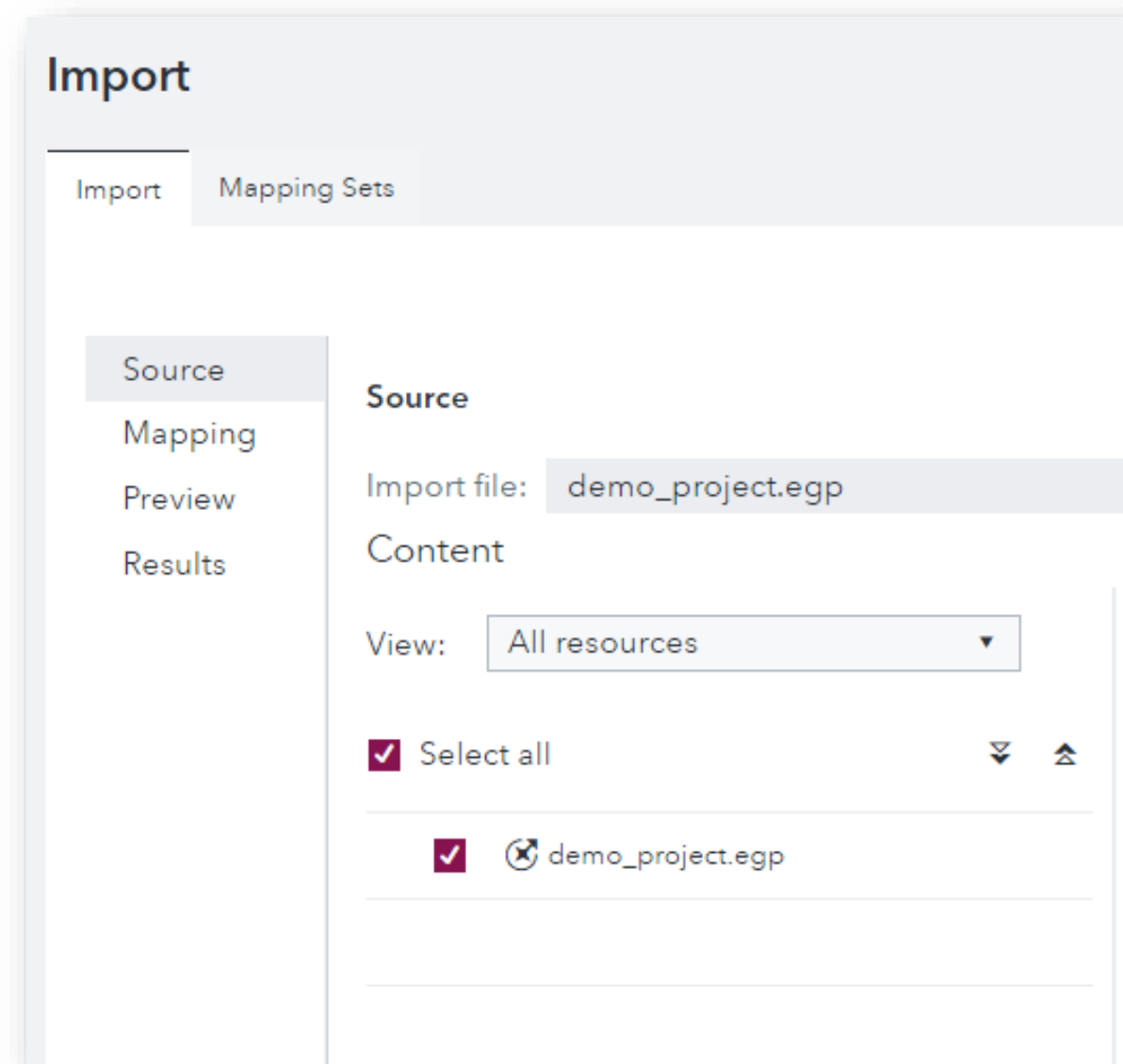




# Automated migration

## Import

### SAS Environment Manager

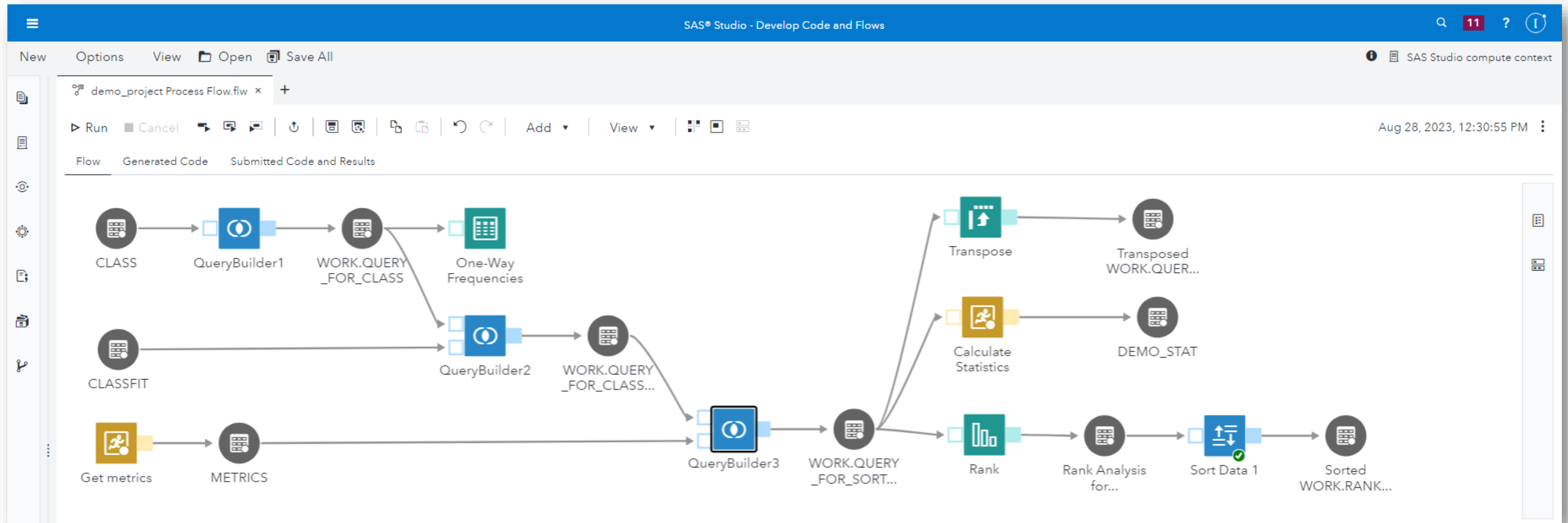


### Command Line Utility (CLI)



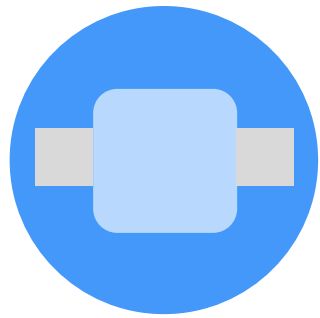
# Automated migration

## Compare, refactor, run





# What's Coming?



## More Steps

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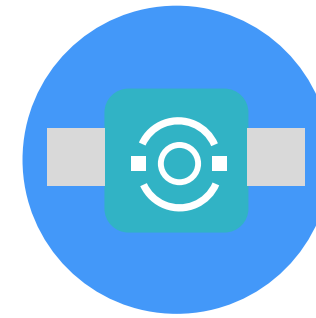
Data Visualization, Data Quality Steps, Look Up



## New UI

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Revamped User Interface with new data viewer, data connection browser



## More Custom Steps

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Extended controls, SAS Tasks Conversion



## More Integration

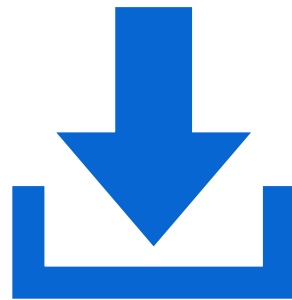
---

With SAS Information Catalog, Data Quality, Model Studio/Manager, Intelligent Decisioning, In-Database

# Resources



[GitHub Repository for  
Sharing SAS® Studio  
Custom Steps](#)



[Download ALL Custom  
Steps from the GitHub  
Repository](#)



[SAS Community  
Articles on Custom  
Steps](#)



[Custom Step  
Documentation](#)

# Closing Remarks

- Download Section der SAS Clubs
  - <https://github.com/gerhard1050/DACH-SASUserGroups/tree/SAS-Club>
- Playlist Viya-Verse von David Weik
  - <https://www.youtube.com/@DavidWeik/playlists>
- Ask-the-expert
  - [https://www.sas.com/de\\_de/learn/ask-the-expert-webinars.html](https://www.sas.com/de_de/learn/ask-the-expert-webinars.html)
- Einladungen zum SAS-Club