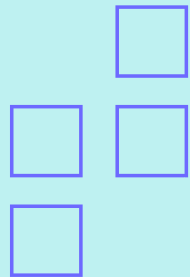


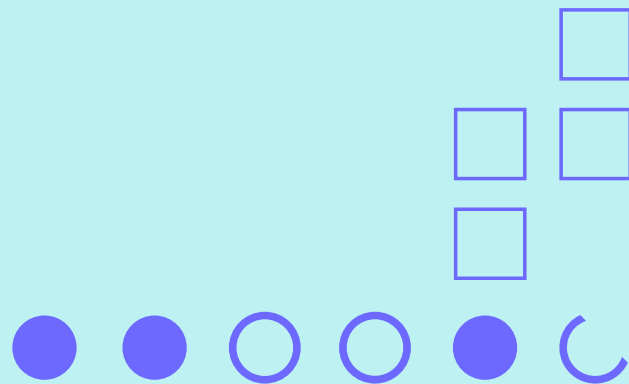
SAS und DevOps...

...und ein Blick auf das SAS Studio in SAS Viya



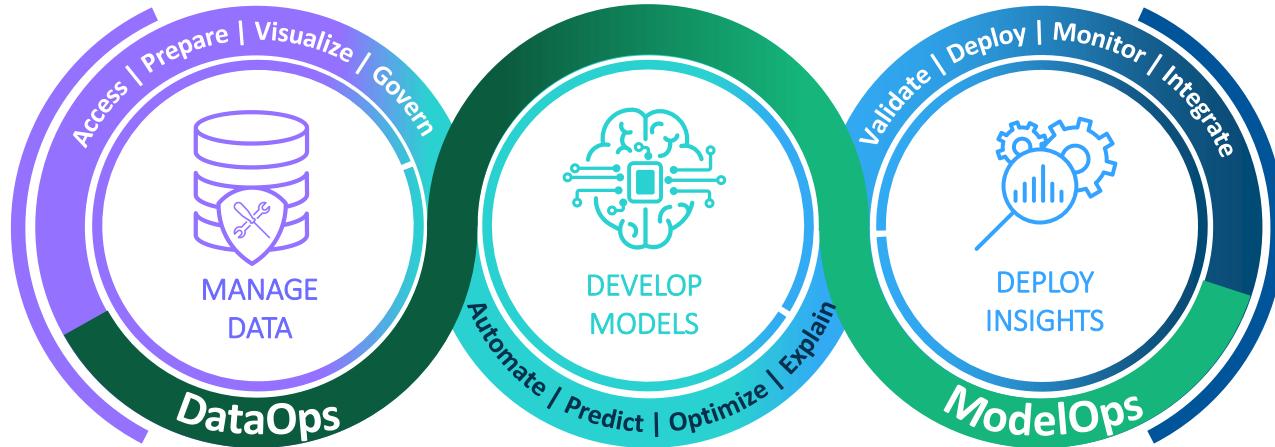


Ops, I did it .. again



Analytics Lifecycle

QUESTION



DECISION



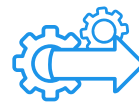
Statistics
Machine & Deep Learning



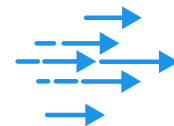
Forecasting &
Optimization



Deployment



Decision
Management



Computer & Machine Vision,
Audio Processing



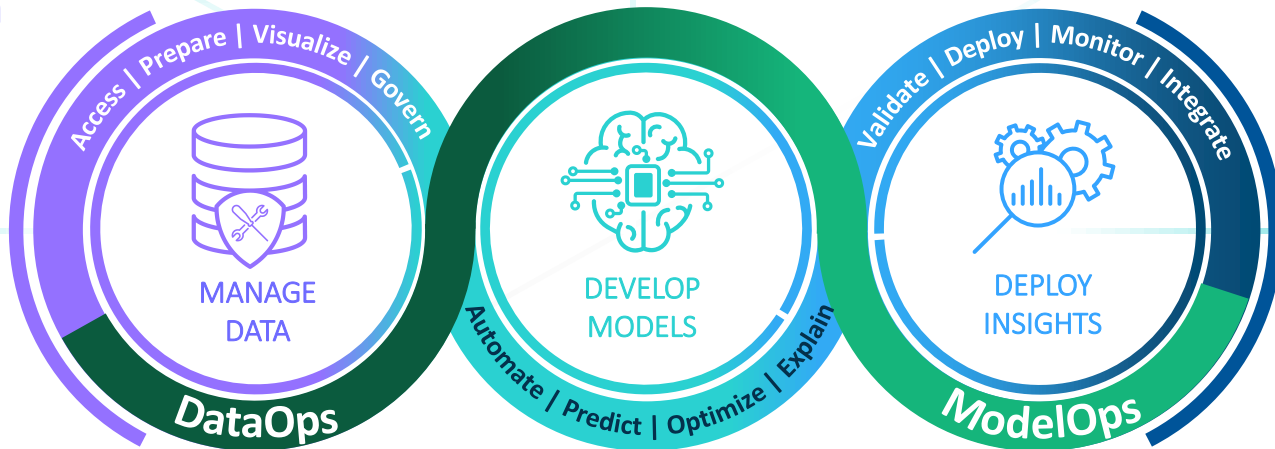
Natural Language Processing



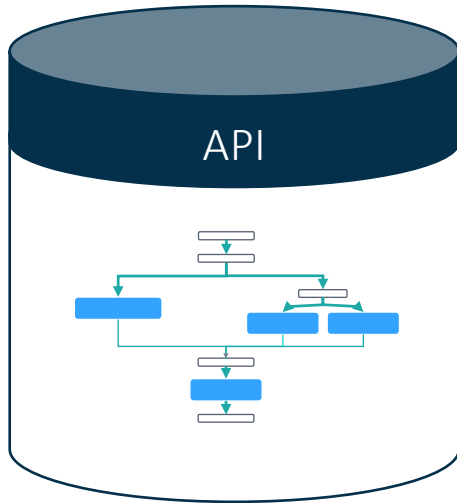
Visualization



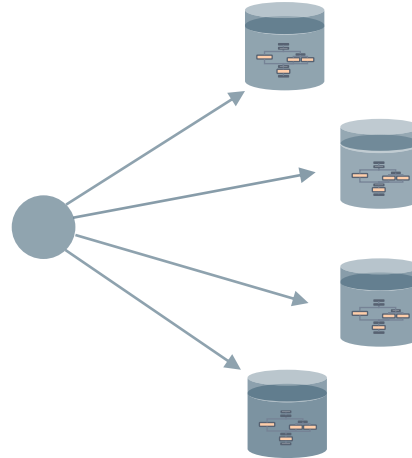
Data
Management



CONTAINERIZE



DEPLOY



INTEGRATE



8 wichtige Eigenschaften von SAS Viya

SAS Viya – Analytik All-in-one

Output und Ergebnisse

1



Analyseergebnisse in **Dashboards** aufbereiten und bereitstellen

2



Big Data Analytics –

Mit NLP, Computer Vision, Machine/Deep Learning für neue Anforderungen gerüstet sein

SAS in Action

```
%let id = SASClub22;  
proc transpose;  
proc report;  
proc summary;  
data _NULL_;
```

3

SAS Programmierung

und bestehende Auswertungen weiterhin nutzen und ausbauen

python™



Erhöhung der Produktivität und Einbeziehen von unterschiedlichen Benutzergruppen mit **NoCode/LowCode**

4

Integration von SAS und **Open Source**

5

Governance



6

Analyse-Code strukturieren, dokumentieren, verwalten und wiederverwenden



7

Unterstützung des statistischen Lebenszyklus:
Data Governance, Model Governance



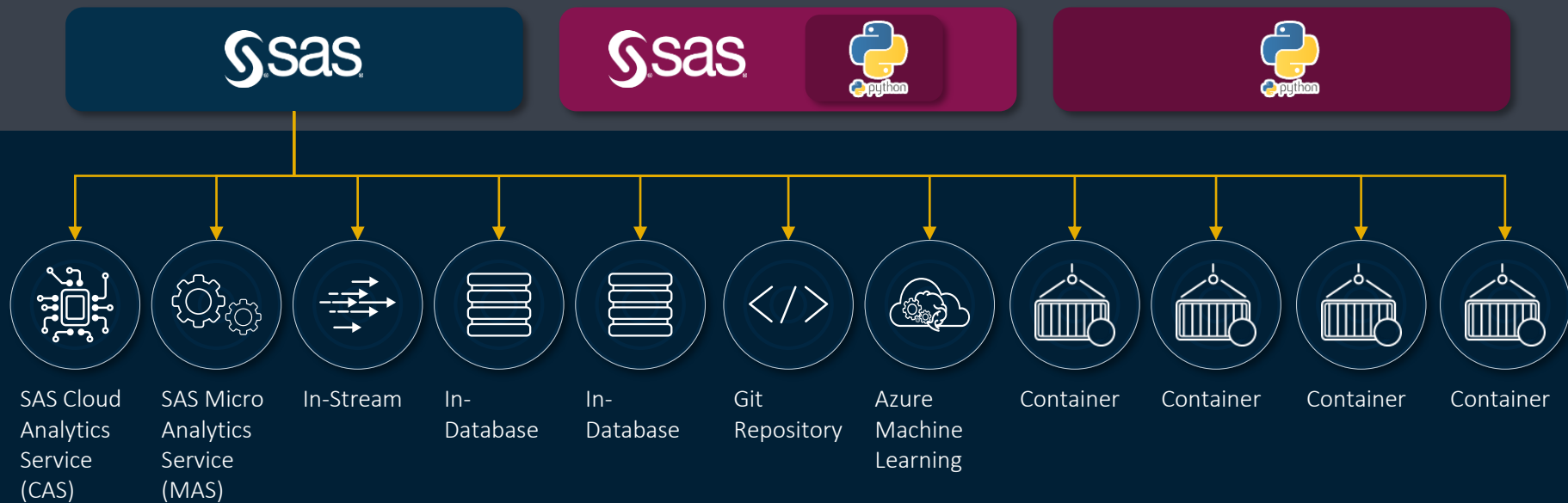
8

DevSecOps

Einbeziehung von Schutzbedarf

Publishing Destinations

Model source



https://go.documentation.sas.com/doc/en/mdlmgcdc/v_017/mdlmgug/n1nrmfpk1ysdt6n1a3ysrcljhuuy.htm



Versionierung

Kollaboration & Nachvollziehbarkeit

- Integration mit Git für:
 - SAS Code Dateien
 - Python Code Dateien
 - Custom Steps
 - Flows
 - Modelle
 - Entscheidungen
 - Beliebige andere Dateien wie z.B. csv, txt, ...

Git Oberfläche

Start Page

test2 x +

test2
Current repository

master
Current branch

Pull master
Last pulled: Jul 20, 2021, 2:05:40 ...

Push master
Last pushed: Jul 20, 2021, 2:05:01 PM

Commit

History

	Message	Author	Date	Commit ID
✓ master origin/master	Custom Steps	David.Weik	Jun 23, 2021, 5:29:53 PM	58a2edc
	CAS API, Custom Step, Documentation	David.Weik	Jun 23, 2021, 1:38:45 PM	cf62aab
	Model Registration	David.Weik	Jun 10, 2021, 10:49:50 AM	e95fd77
	Schema for SWAT Binary	David.Weik	Jun 9, 2021, 5:10:53 PM	bc0f3ce
	Update JS example	David.Weik	Jun 8, 2021, 1:39:16 PM	db3a50c
	Selenium example	David.Weik	Jun 8, 2021, 8:51:44 AM	b260654
	Fixed typo	David.Weik	Jun 7, 2021, 6:30:08 PM	05ba154
	Update Readme	David.Weik	Jun 7, 2021, 6:26:15 PM	caea302
	Authorization Rules	David.Weik	Jun 7, 2021, 6:25:08 PM	c73a24b
	Update README.md	David.Weik	Jun 7, 2021, 12:01:32 PM	6ec0266
	Update README.md	David.Weik	Jun 7, 2021, 11:44:41 AM	98e5d77
	Example to call REST APIs via SAS and JavaScript	David.Weik	Jun 7, 2021, 10:01:39 AM	ada6f10
	Fix typos	David.Weik	Jun 4, 2021, 5:12:16 PM	c2e9ed8

Author: David.Weik

Jun 23, 2021, 5:29:53 PM

58a2edc51ca794af401d3d1287df556408a66c5f

Custom Steps

Parent: cf62aab

✓

SAS/Custom Steps/Microsoft Teams Channel ...

✓

SAS/Custom Steps/Microsoft Teams Channel ...

✓

SAS/Custom Steps/Microsoft Teams Channel ...

✓

SAS/Custom Steps/Microsoft Teams Channel ...

✓

SAS/Custom Steps/Microsoft Teams Channel ...

✓

SAS/Custom Steps/Microsoft Teams Channel ...

✓

SAS/Custom Steps/Microsoft Teams Channel ...

✓

SAS/Custom Steps/Microsoft Teams Channel ...

diff --git a/SAS/Custom Steps/Microsoft Teams Channel Message Simple/MicrosoftTeamsChannelMessageSimple.json b/SAS/Custom Steps/Microsoft Teams Channel Message Simple/MicrosoftTeamsChannelMessageSimple.json

@@ -0,0 +1,280 @@

+{

+ "creationTimeStamp": "2021-06-23T10:12:50.521Z",

+ "modifiedTimeStamp": "2021-06-23T10:12:51.080Z",

+ "createdBy": "sasdemo",

+ "modifiedBy": "sasdemo",

+ "links": [

+ {

+ "method": "GET",

+ "rel": "self",

+ "href": "/transfer/packages/d6f1cc83-b743-4105-98b4-644ae8761912",

+ "uri": "/transfer/packages/d6f1cc83-b743-4105-98b4-644ae8761912",

+ "type": "application/vnd.sas.transfer.package"

+ },

+ {

+ "method": "GET",

+ "rel": "alternate",

+ "href": "/transfer/packages/d6f1cc83-b743-4105-98b4-644ae8761912",

+ }

+ }

Recover (161)

Submission (0)

GIT_ Functions
GIT_BRANCH_CHKOUT Function
GIT_BRANCH_DELETE Function
GIT_BRANCH_MERGE Function
GIT_BRANCH_NEW Function
GIT_CLONE Function
GIT_COMMIT_FREE Function
GIT_COMMIT Function
GIT_COMMIT_GET Function
GIT_COMMIT_LOG Function
GIT_DELETE_REPO Function
GIT_DIFF_FILE_IDX Function
GIT_DIFF_FREE Function
GIT_DIFF Function
GIT_DIFF_GET Function
GIT_INDEX_ADD Function
GIT_INDEX_REMOVE Function
GIT_PULL Function
GIT_PUSH Function
GIT_RESET_FILE Function
GIT_RESET Function
GIT_STATUS_FREE Function
GIT_STATUS Function
GIT_STATUS_GET Function
GIT_VERSION Function

Git im Data Step

Warum klicken wenn ich programmieren kann!

24 Funktionen um mit Git Code basiert
arbeiten zu können

```
data _null_;  
  rc= git_pull(  
    "your-local-repository",  
    "ssh-user-name",  
    "ssh-password",  
    "ssh-public-key",  
    "ssh-private-key");  
  rc= git_push(  
    "your-local-repository",  
    "ssh-user-name",  
    "ssh-password",  
    "ssh-public-key",  
    "ssh-private-key");  
run;
```

Linting für SAS

Einheitliches SAS-Code Bild

```
{  
  "noEncodedPasswords": true,  
  "hasDoxygenHeader": true,  
  "hasMacroNameInMend": true,  
  "hasMacroParentheses": true,  
  "indentationMultiple": 2,  
  "lowerCaseFileNames": true,  
  "maxLineLength": 80,  
  "noNestedMacros": true,  
  "noSpacesInFileNames": true,  
  "noTabIndentation": true,  
  "noTrailingSpaces": true  
}
```

Testen von SAS Code

Community-Getriebenes Test-Framework

A number of ready-made assertion macros are available in the `mp_assert` library.

- `mp_assert` - generic assertion
- `mp_assertcols` - Asserts the existence (or not) of certain columns
- `mp_assertcolvals` - Asserts the existence (or not) of particular column values
- `mp_assertdsobs` - Asserts the existence (or not) of dataset observations
- `mp_assertscope` - Compares before/after to detect scope leakage in a SAS Macro

GitOps

 .gitlab-ci.yml  2.67 KiB

Open in Web IDE



Replace

Delete

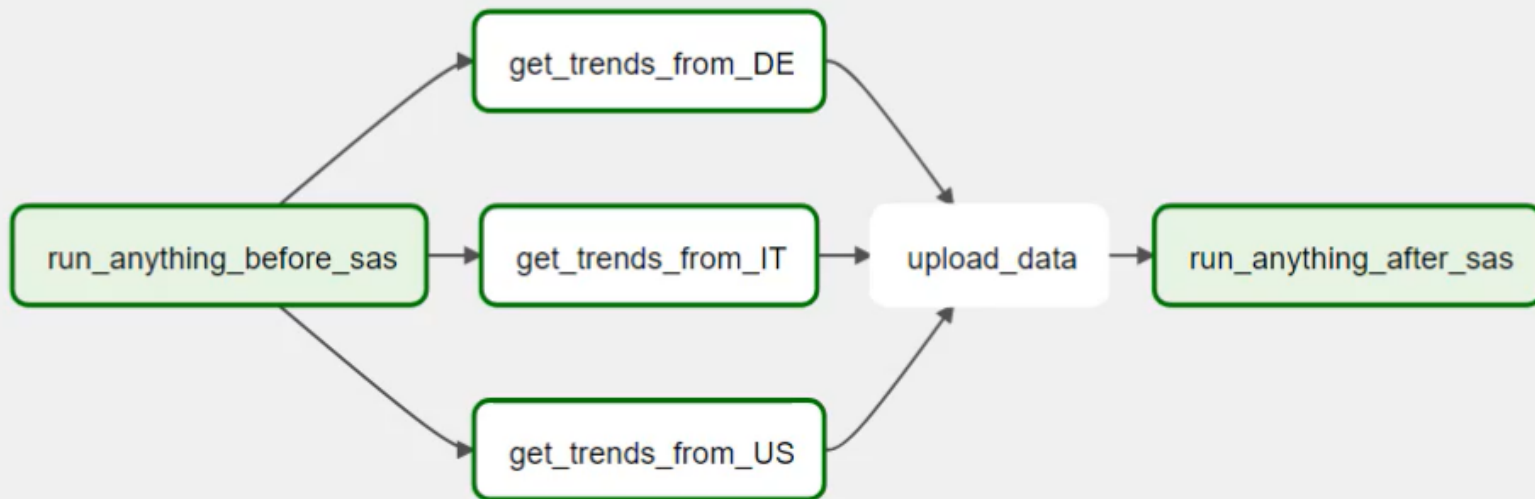


```
1 # This file is a template, and might need editing before it works on your project.
2 # To contribute improvements to CI/CD templates, please follow the Development guide at:
3 # https://docs.gitlab.com/ee/development/cicd/templates.html
4 # This specific template is located at:
5 # https://gitlab.com/gitlab-org/gitlab/-/blob/master/lib/gitlab/ci/templates/Getting-Started.gitlab-ci.yml
6
7 # This is a sample GitLab CI/CD configuration file that should run without any modifications.
8 # It demonstrates a basic 3 stage CI/CD pipeline. Instead of real tests or scripts,
9 # it uses echo commands to simulate the pipeline execution.
10 #
11 # A pipeline is composed of independent jobs that run scripts, grouped into stages.
12 # Stages run in sequential order, but jobs within stages run in parallel.
13 #
14 # For more information, see: https://docs.gitlab.com/ee/ci/yaml/index.html#stages
15
16 # Use 'pipelines for merge requests'
17 # Pipeline is run every time you make changes to the source branch for a merge request
18 # https://docs.gitlab.com/ee/ci/pipelines/merge_request_pipelines.html
19 workflow:
20   rules:
21     #- if: $CI_PIPELINE_SOURCE == 'merge_request_event'
22     - if: $CI_COMMIT_BRANCH == $CI_DEFAULT_BRANCH
23
24   stages:           # List of stages for jobs, and their order of execution
25     - build
26     - test
27     - deploy
28
29   build-job:        # This job runs in the build stage, which runs first.
30     stage: build
31     script:
32       - echo "Running SAS Studio Flow..."
33       - echo "Compiling the code..."
34       - echo "Compile complete."
35     #- pwd
36     #- echo CI_PROJECT_DIR=$CI_PROJECT_DIR
37     #- python3 main.py --sas-endpoint http://server.demo.sas.com --user sasdemo --password Orion123 --flow $CI_PROJECT_DIR/summary-flow.flw
38     #- python3 -m pip install requests
39     - python3 main.py --sas-endpoint $sas_endpoint --user $user --password $password --flow $CI_PROJECT_DIR/summary-flow.flw
40   artifacts:
41     name: "$CI_PIPELINE_ID-$CI_JOB_NAME"
42     paths:
43       - "*.log.txt"
44       - "*.list.txt"
```

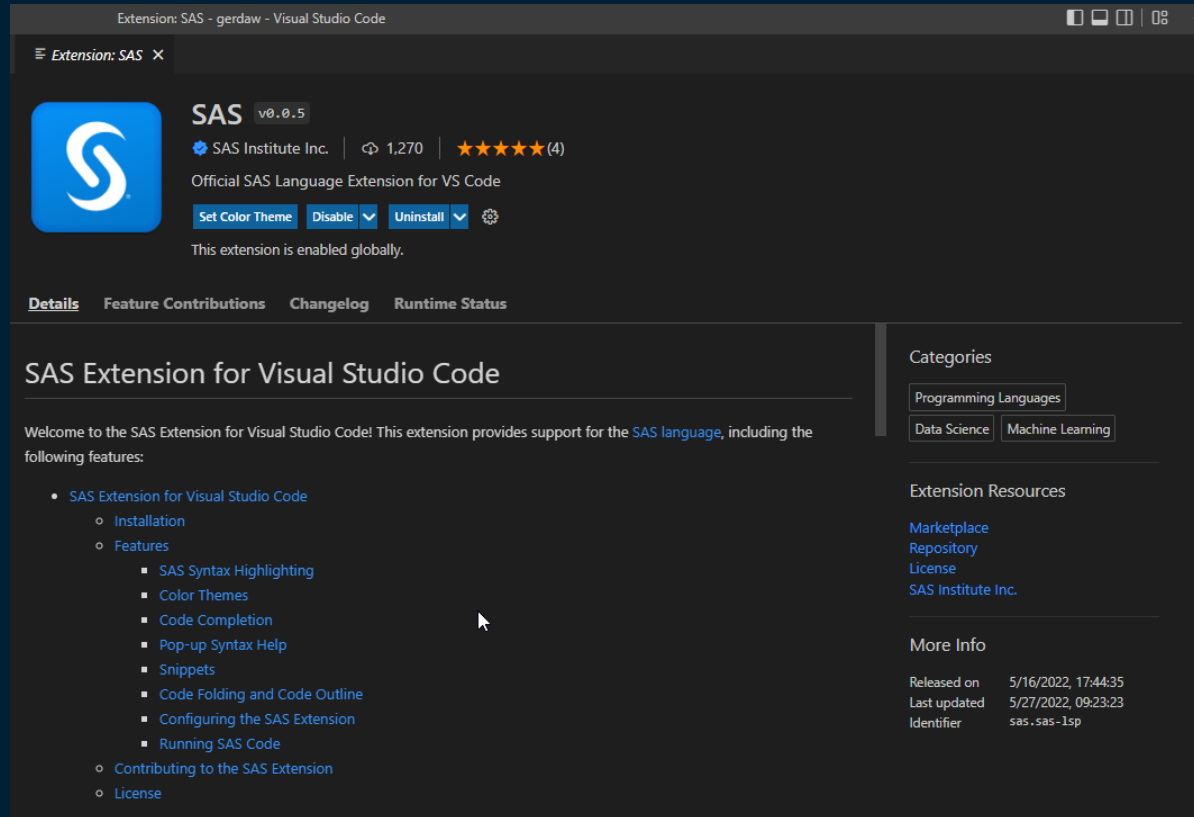
GitOps Visuell

Status	Pipeline	Triggerer	Stages
<div>✓ passed</div> <div>🕒 00:00:46</div> <div>📅 1 month ago</div>	<div>Merge branch 'feature1' into 'main'</div> <div>#526863794 🔗 main 🔗 d5a786b8 🌐</div> <div>latest</div>		<div>test: passed</div> <div>✓ ✓ ✓</div>

Orchestrierung über Scheduler



SAS Erweiterung für VS Code



Extension: SAS - gerdaw - Visual Studio Code

SAS v0.0.5
SAS Institute Inc. | 1,270 | ★★★★★ (4)
Official SAS Language Extension for VS Code
Set Color Theme | Disable | Uninstall | ⚙️
This extension is enabled globally.

Details | Feature Contributions | Changelog | Runtime Status

SAS Extension for Visual Studio Code

Welcome to the SAS Extension for Visual Studio Code! This extension provides support for the [SAS language](#), including the following features:

- SAS Extension for Visual Studio Code
 - Installation
 - Features
 - SAS Syntax Highlighting
 - Color Themes
 - Code Completion
 - Pop-up Syntax Help
 - Snippets
 - Code Folding and Code Outline
 - Configuring the SAS Extension
 - Running SAS Code
 - Contributing to the SAS Extension
 - License

Categories
Programming Languages
Data Science | Machine Learning

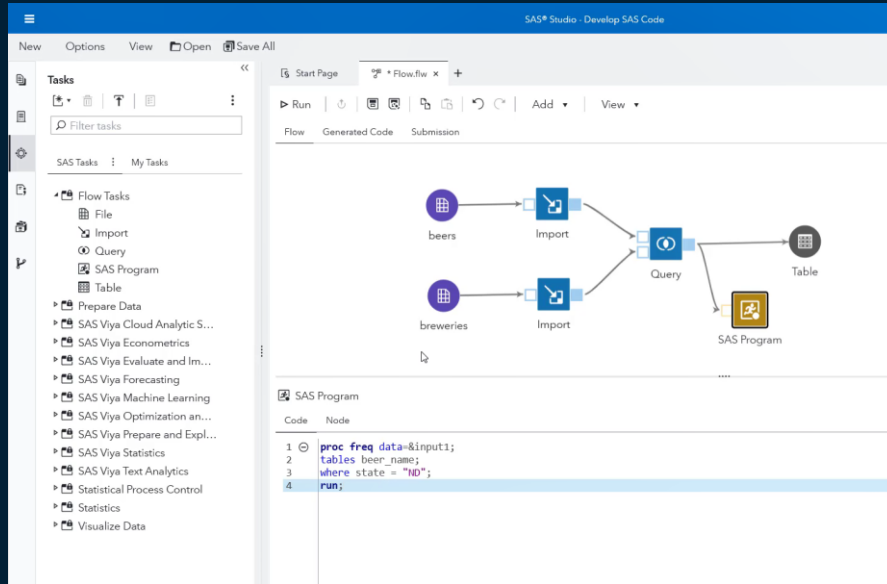
Extension Resources
[Marketplace](#)
[Repository](#)
[License](#)
[SAS Institute Inc.](#)

More Info
Released on 5/16/2022, 17:44:35
Last updated 5/27/2022, 09:23:23
Identifier sas.sas-lsp

SAS Studio

SAS Studio

Vereinheitlichter Flow Designer auf SAS Viya



Die Konvergenz von SAS Enterprise Guide und SAS Data Integration Studio richtet sich an Programmierer, Datenanalysten und ETL-Entwickler.

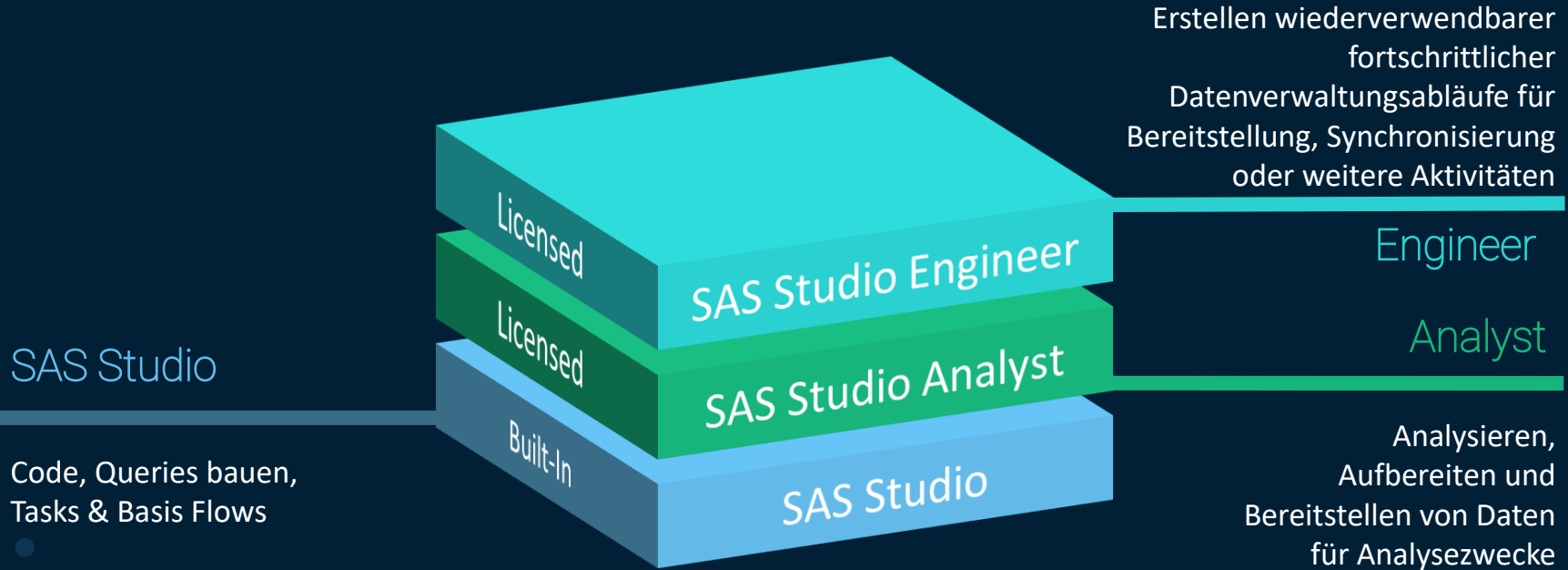
Funktionale Äquivalenz

Funktionsgleichheit und neue Funktionen

Umstellung von SAS 9.4

SAS Studio – Rollenbasierte Nutzung

Integrierte Entwicklungsumgebung für Analytik und Datenmanagement



SAS Studio

Übersicht über die Features der drei Stufen



SAS STUDIO (PROGRAMMIERER)

Code Editor

GIT Integration

Tasks, Snippets und Queries

Datei Import

Flow Designer inklusive Table,
File, Import, SAS Program,
Query, Sort



SAS STUDIO ANALYST

SAS Studio (Programmierer)

Erweiterter Flow Designer
inklusive

- Data Movements (CRUD)
- Data Preparation for Analytics
- Custom Steps & Prompts
- Data Quality



SAS STUDIO ENGINEER

SAS Studio Analyst

Information Catalog

In-DB Technologies
Teradata, Hadoop, Spark

Erweiterter Flow Designer
inklusive ETL spezifische Flow
Steps & Optionen

Code Optimization

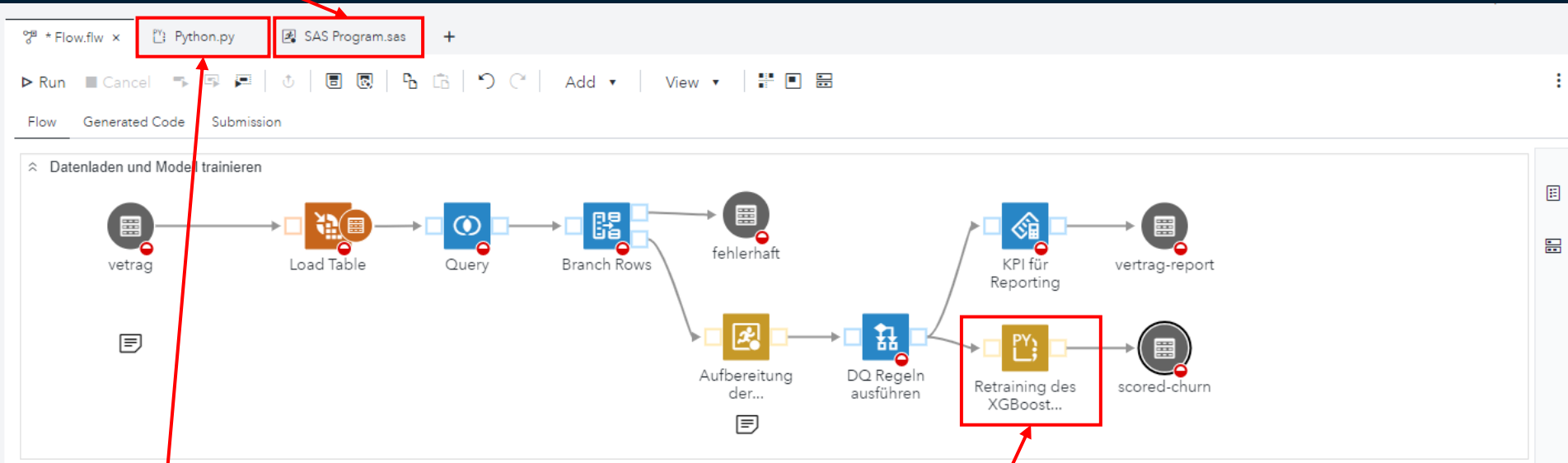
SAS Studio

Kombination von visuellen Prozessflüssen mit Code-Editoren

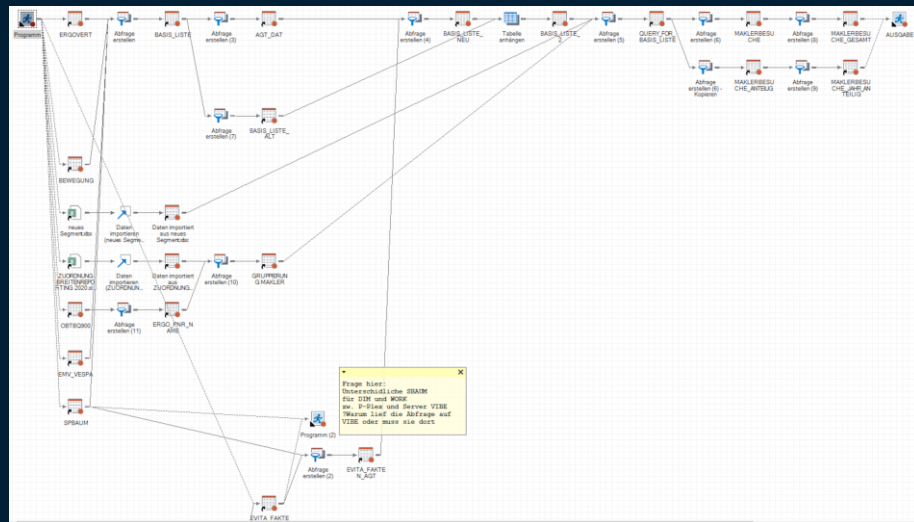
SAS Code Editor

Python Code Editor

Python Programm als
Schritt im Flow

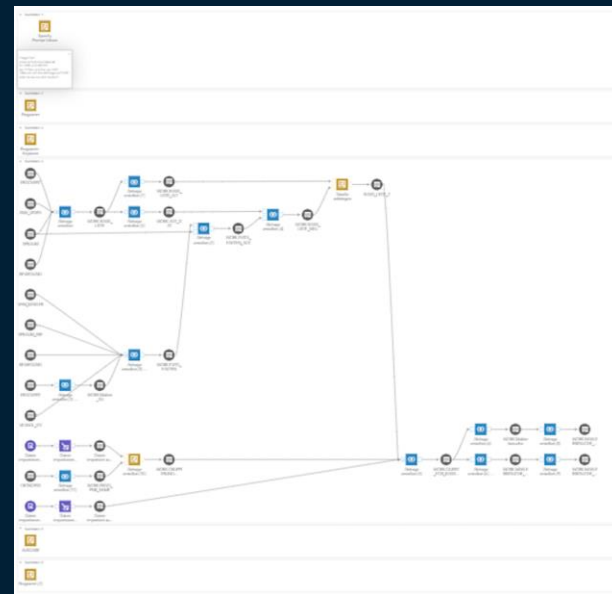


SAS Enterprise Guide



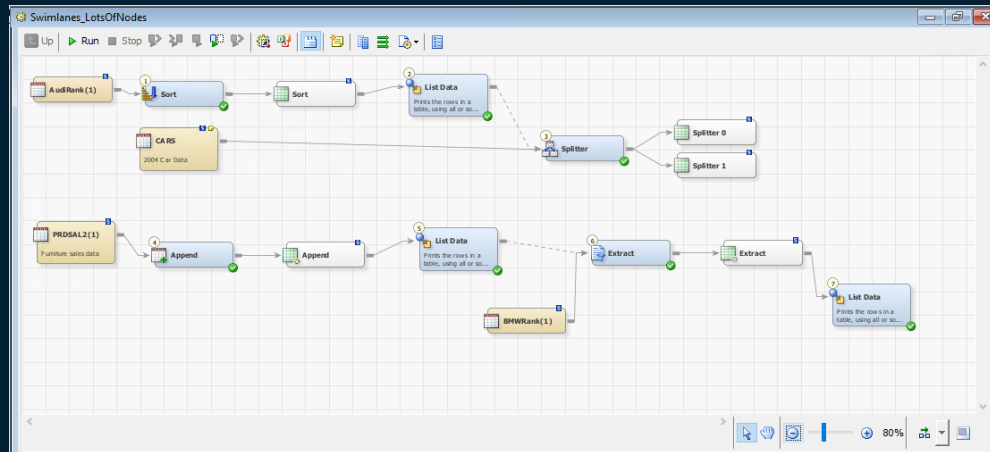
SAS 9

SAS Studio



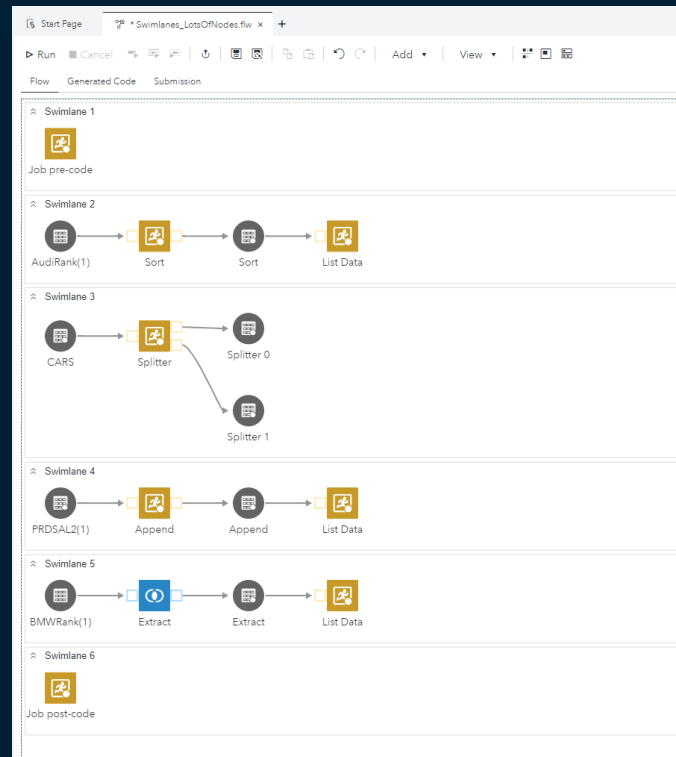
SAS Viya

SAS Data Integration Studio



SAS 9

SAS Studio



SAS Viya



Demo

sas.com

