



Open-Source integration in SAS Viya

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Agenda

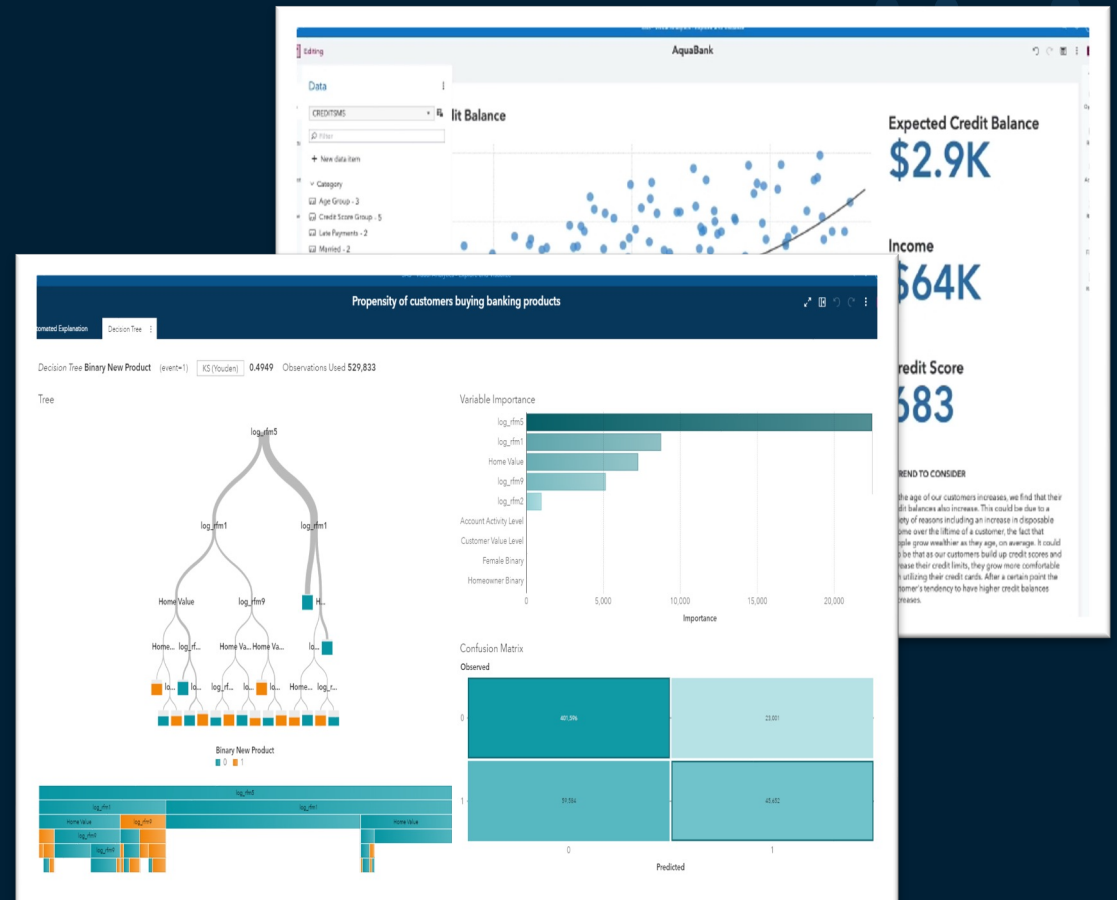
- Introduction Open-Source Integration
- Executing SAS + R + Python from SAS Studio
- Executing Flows or custom steps for above code
- Executing SAS from R Studio
- Executing SAS from python

What is SAS Viya?

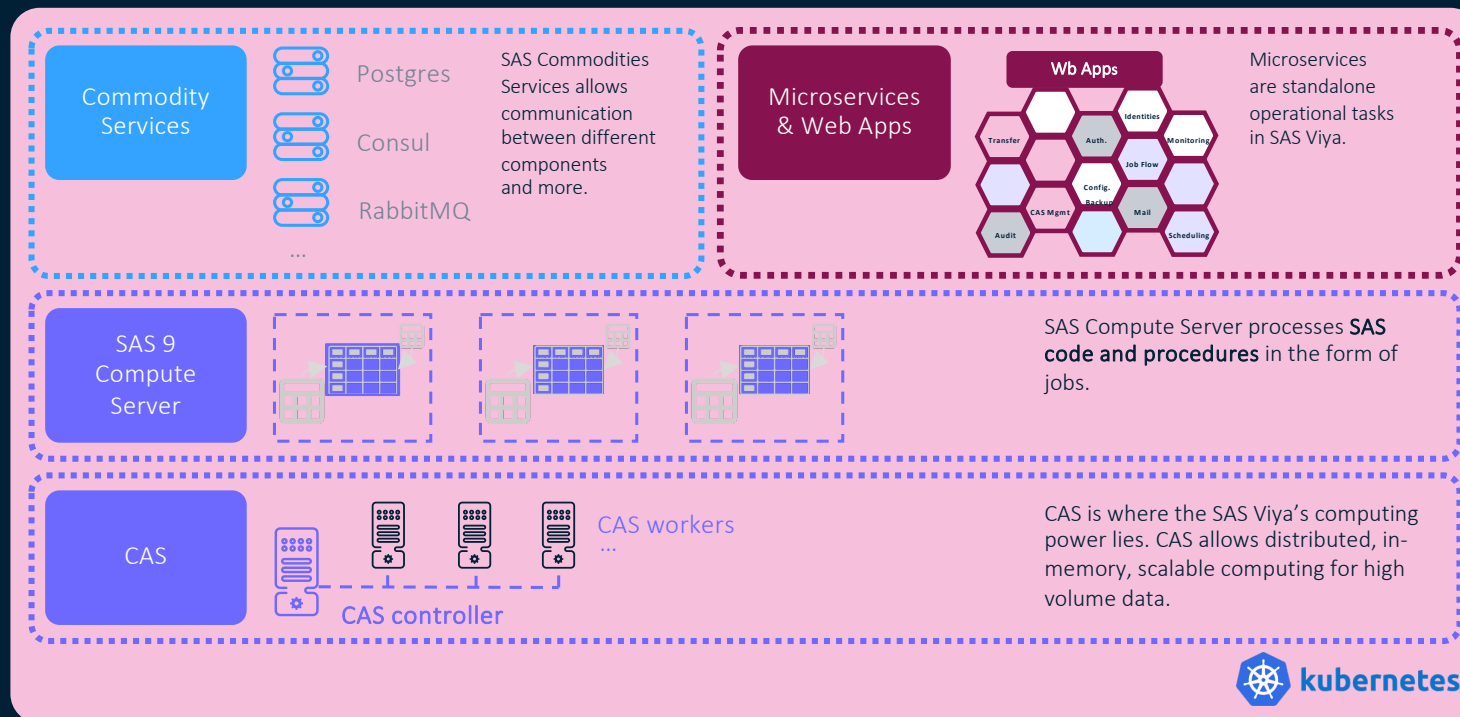
SAS Viya is a software platform which offers capabilities to address the analytics lifecycle.

Quickly transform raw data into operational insights that support every kind of decision your organization makes.

SAS Viya is accessed securely through the web, no need to install anything locally. Whether you are a programmer (both SAS and open source), a data scientist, or an executive, you can use SAS Viya to get your work done.



The Basics of SAS Viya's Architecture



= THE ENGINE



= CONTROL SYSTEM

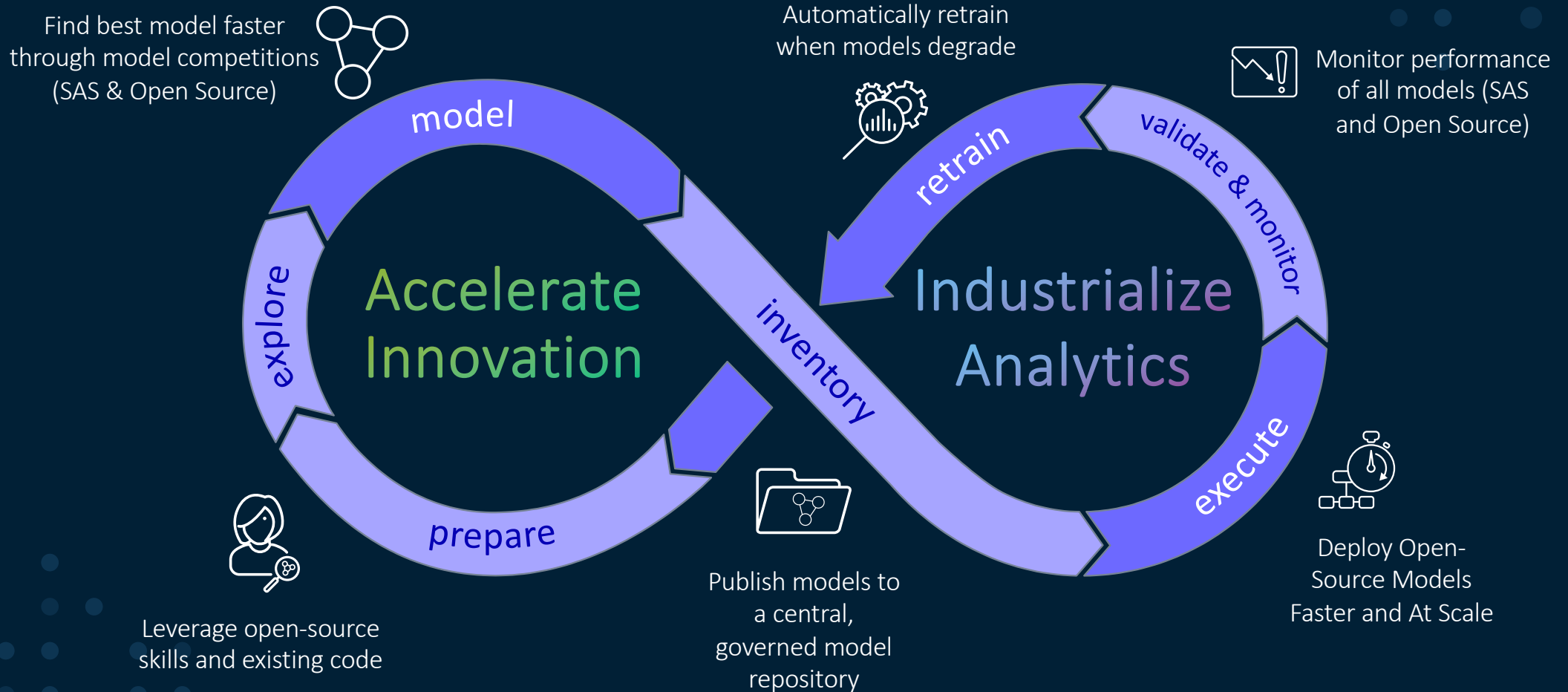


= SUPPORTING PARTS

Overview slide: R and Python

- What is R?
 - R is an open-source programming language most often utilized in statistical computing and machine learning settings
 - Popular packages: tidyverse, ggplot, shiny
- What is Python?
 - Python is an open-source general purpose programming language often used in data science/ML
 - Easy to read and highly flexible due to the variety of user-made packages and models available to install
 - Popular data science packages: numPy, sciPy, pandas, Mlflow, TensorFlow, Seaborn
- [Learn more about popular open-source tools](#)

Open Source and SAS Throughout the Analytics Lifecycle



Open-Source integration can work in both directions:

1. Viya to open source:



2. Open source to Viya:

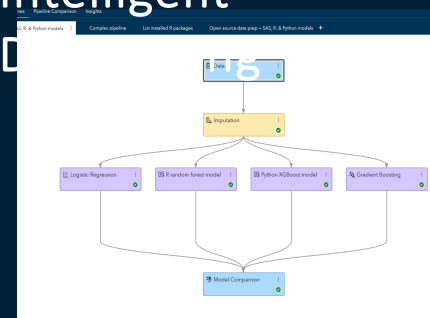


What does open-source integration with Viya look like?

SAS Studio

```
Run Cancel | | | | | Copy
Code
1 proc python;
2   submit;
3   ### begin Python code:
4   print("hello from python!")
5   endsubmit;
6   quit;
7
```

Model Studio & Intelligent



Visual Analytics

Page 1 |

Update Table via Python

Job Execution to Run a Python Script

Use the drop-down menu to select a column, then enter a text value to add to the existing table in the selected column.

Column to update:

Value to enter:

Jupyter Notebook

```
jupyter CAS from Python within Jupyter Notebook
File Edit View Insert Cell Kernel Widgets Help
+ - - - - - Run - - - - - Code
Connect to the Viya server
Use the CAS function from the swat library to establish the connection
In [2]: 1 s = swat.CAS('sasserwer.demo.sas.com', 8777)
2 s.sessionName(name="Python-and-Viya")
3
4 s.loadactionset(actionset='regression')
```

RStudio

```
R-to-CAS.R
Source on Save
1 ##### R code for connecting to Viya
2
3 ### Load SWAT Library
4 library('swat')
5
6 ### Set up connection
7 s <- CAS('sasserwer.demo.sas.com', 8777)
8
```

Web apps



1. Viya to Open-Source

Enhanced Capabilities

- Model competitions
- Hybrid pipelines (SAS + open source)
 - Integrate open-source models in both drag-and-drop (Model Studio) and programming (SAS Studio) interfaces
- Streamlined model publishing and deployment
- Workflow orchestration and automation

2. Open-Source to Viya

Enhanced Capabilities

- Access to Viya's parallel, distributed analytics engine
- Enhanced collaboration
- Streamlined model publishing and deployment
- Open APIs
 - “Bring Your Own Language”
 - Mobile App & Web App Development

Sample code example

```
/*
  Use python to scrape data from a wiki page
  https://en.wikipedia.org/wiki/List_of_Super_Bowl_champions
  Then write it out to a work file
  The python output of the head statement is in the log
*/

proc python;
submit;
import sys
print(sys.version)

import pandas as pd
URL = "https://en.wikipedia.org/wiki/List_of_Super_Bowl_champions"

tables = pd.read_html(URL,attrs = {'class' : 'wikitable sortable sticky'})
sb = tables[0]
sb.head()

ds = SAS.df2sd(sb, 'work.sb')
endsubmit;
run;
```

```
/* Read Data to R */

PROC IML;
call ExportDataSetToR ("Work.teams", "teams");

submit / R;

tapply(teams$Score, teams$Outcome, summary)

library(ggplot2)

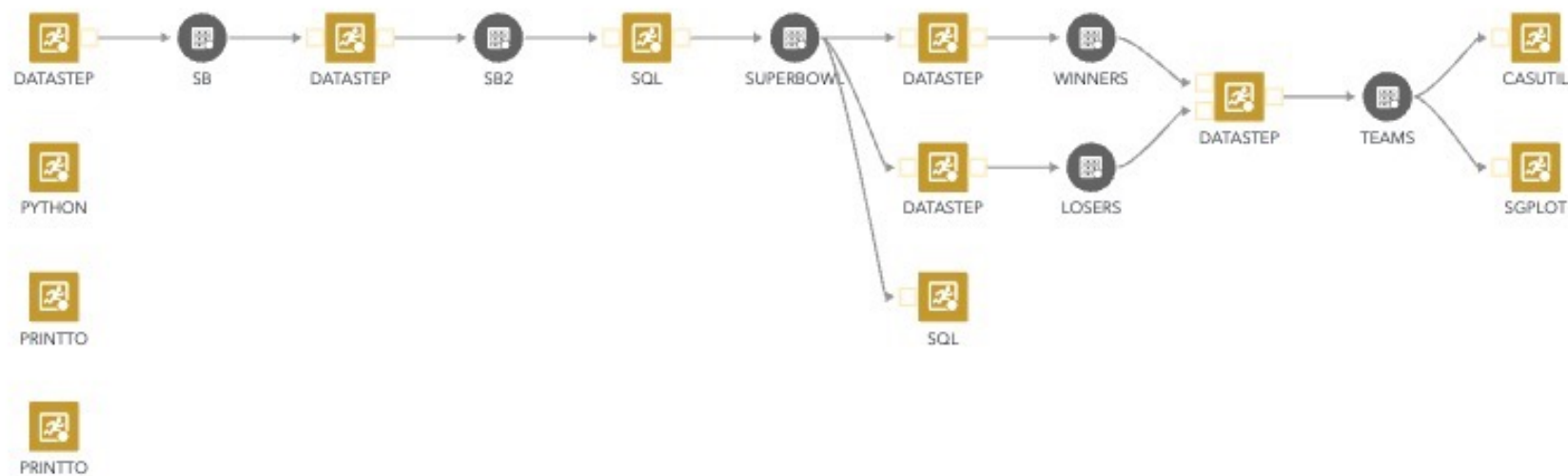
p <- ggplot(teams, aes(x=Outcome, y=Score, color=Outcome)) + geom_boxplot()

png(file="/data/compute-landingzone/Home/bemurp/boxplot.png",width=600,
p
dev.off()

endsubmit;

QUIT;
```

Sample flow example



Workshop Flow

- Introduction
- Navigating the platform
- Opening sas studio
- Navigating to the folder
- Testing SAS\R\Python code
- Running the designed code
- Testing execution of sas in R-Studio
- Testing execution of sas in python

SAS Viya Platform

WebLink

- <https://sashls1.eastus.cloudapp.azure.com>
- <https://sashls1.eastus.cloudapp.azure.com/SASStudio/>
- https://github.com/Pdsaslife/PHUSE_HOW_2025

Connect to SAS Viya

Not secure <https://sashls1.eastus.cloudapp.azure.com/SASDrive>



Your connection is not private

Attackers might be trying to steal your information from **sashls1.eastus.cloudapp.azure.com** (for example, passwords, messages, or credit cards).
[Learn more](#)

NET::ERR_CERT_AUTHORITY_INVALID

To get Chrome's highest level of security, [turn on enhanced protection](#)

Advanced

Back to safety

⚠ Not secure <https://sashls1.eastus.cloudapp.azure.com/SASDrive>



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[Learn more](#)

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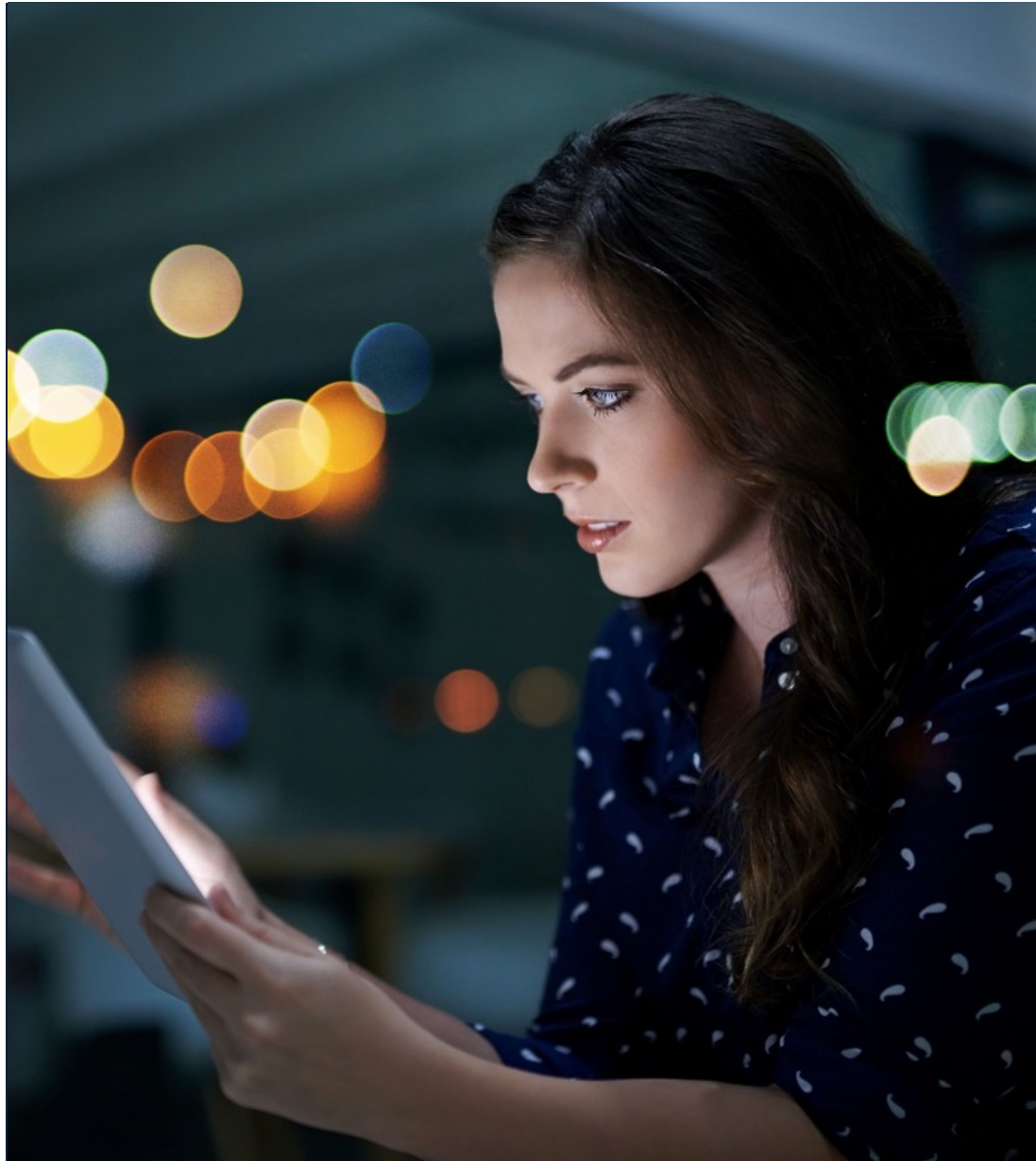
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Hide advanced

Back to safety

This server could not prove that it is **sashls1.eastus.cloudapp.azure.com**; its security certificate is not trusted by your computer's operating system. This may be caused by a misconfiguration or an attacker intercepting your connection.

[Proceed to sashls1.eastus.cloudapp.azure.com \(unsafe\)](#)



Useful Resources for Viya

developer.sas.com

[SAS Blog: Easier Feature Engineering](#)

[Data Science Pilot Action Set documentation](#)

[SWAT Examples on GitHub](#)

[Video recording of Viya and R Studio Integration](#)



Useful Resources

[developer.sas.com \(R site\)](https://developer.sas.com)

[Calling R from SAS/IML \(video\)](#)

SAS Programming for R Users:

- [E-Learning course](#)
- [Course materials \(code, data\)](#)

[Using R code in SAS Enterprise Miner \(video\)](#)