

Best of Both Worlds: SAS and open source



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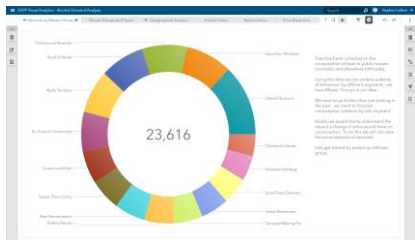
- SAS' openness
- How SAS embraces and extends open source
- Demonstration of open source and SAS integration
- Q +A

SAS – Market Perception

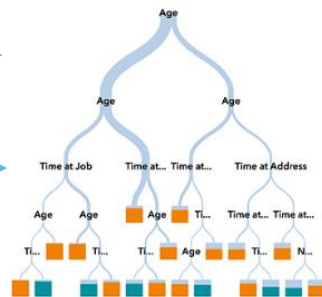


New open architecture: SAS® Viya™

Visual Interfaces



Programming Interfaces



API Interfaces

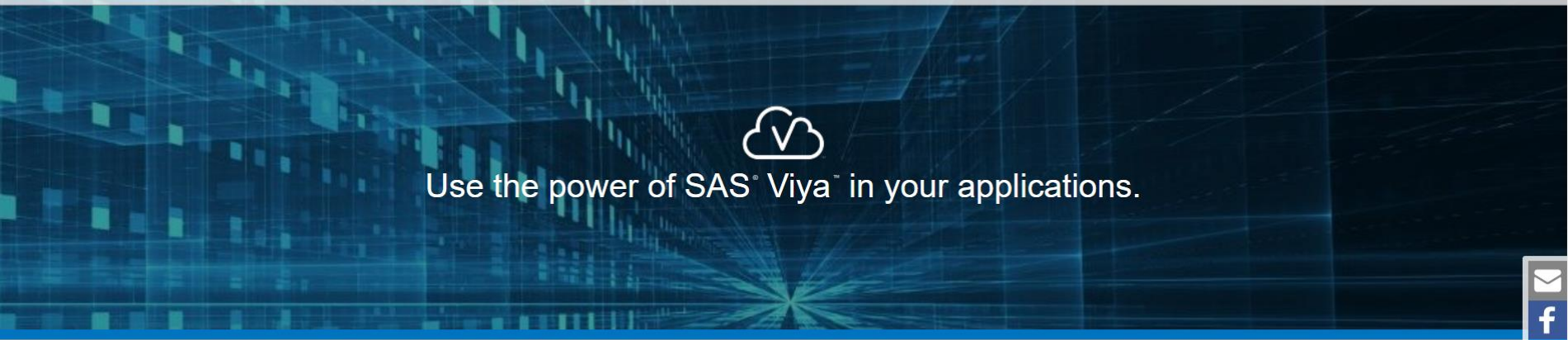




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Use the power of SAS® Viya™ in your applications.

SAS Viya adds enhancements to the SAS platform including accessibility to SAS services for developers and data scientists.





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Subject	Comments	Likes	Contributors	Views	Latest Article
Running Data Step from Python Labels: cas python viya	0	1		282	04-14-2016 12:57 PM by KevinSmith
Loading Data from Python into CAS Labels: cas python viya	0	0		260	04-13-2016 11:47 AM by KevinSmith
Simple Statistics in Python Labels: cas python viya	0	0		118	04-13-2016 02:18 PM by KevinSmith

Resources

- [SAS Viya API documentation](#)
- [About SAS Cloud Analytic Services](#)
- [SAS Viya Coders Library](#)
- [SAS Viya Programming Examples on GitHub](#)
- [Learn Python \(python.org\)](#)

Labels

cas (10)

- SAS' openness
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- Demonstration of open source and SAS integration

SAS as an Integrated Open Platform

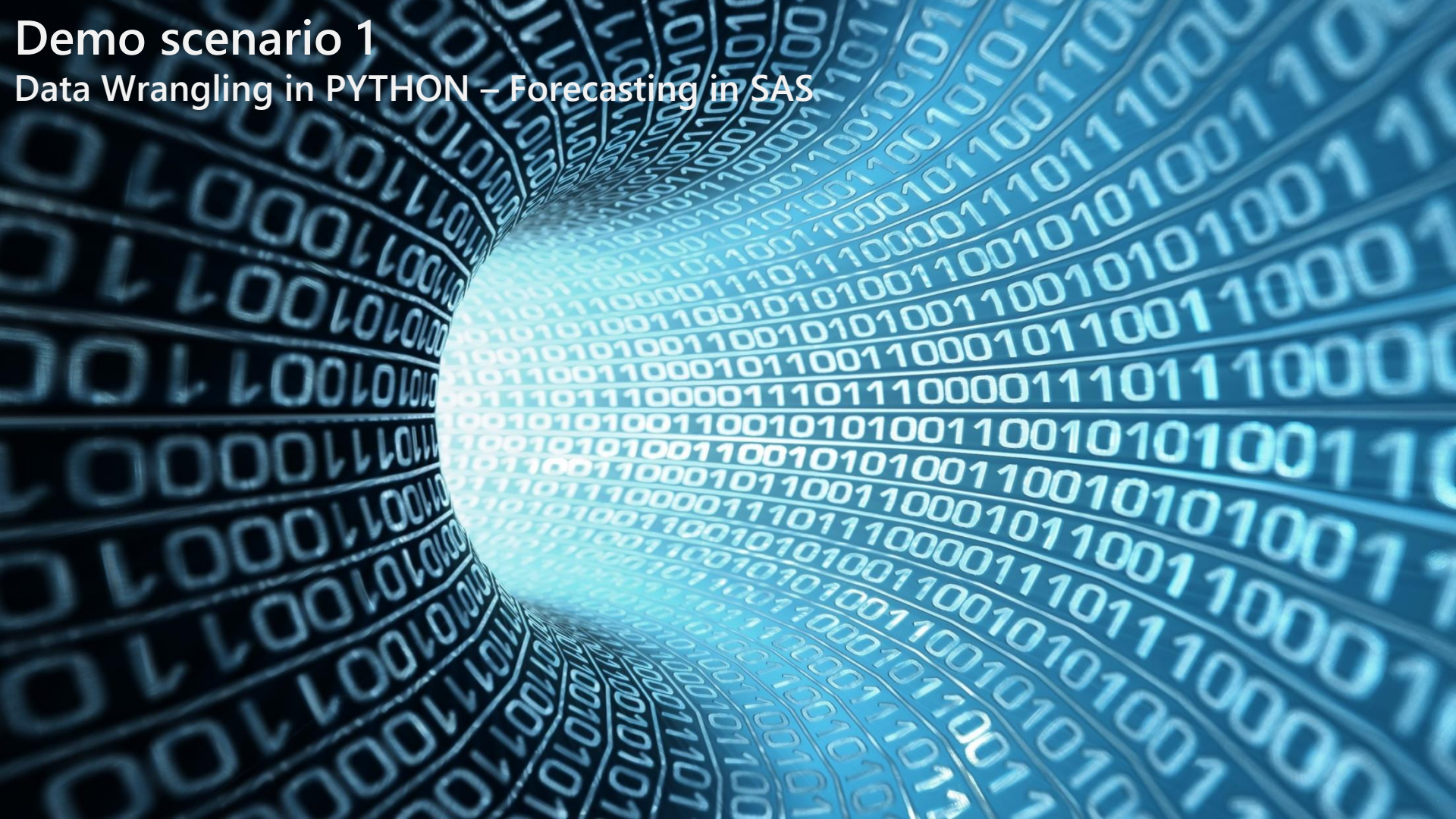
- Joint development and deep integration with Hadoop
- Rapid prototyping and utilising all available resources
- Incorporating open source models into the analytical life cycle
- Providing governance and lineage of data and models
- Scalability and speed in deployment without any recoding



- SAS' openness
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Demo scenario 1

Data Wrangling in PYTHON – Forecasting in SAS





Python is an interpreted, object-oriented, high-level programming language with modular libraries that support data extraction and processing.

The Jupyter Notebook is a web application that allows you to create and share documents that contain live code, equations, visualizations and explanatory text.

The notebook has support for over 40 languages including SAS and Python.

```

In [1]: %libname c_data './bbddm';
        %filename s_hpc './bbddm/ccta_hplus_score.sas';
        ***Load macro for varList;
        %include './bbddm/ccta_gpreun.sas';

Last executed on Fri, Oct 30 2018 at 12:32 PM UTC
    
```

```

Out[1]: 1. ods listing close; ods html5 files=about opt=html5; mdsr('mlsr') decreasing ods graphics on / outstat=prng;
        NOTE: Writing HTML5 Body File: ST0007
        2. %let n=1;
        3. %let c_data=.;
        NOTE: LIBREF C DATA was successfully assigned as follows:
        Engine: SAS
        Physical Name: /home/jupyter/ncs
        Fileref Name: C:/sas/ncs/ccta_hplus_score.sas
        4.
        5. ***Load macro for varList;
        6. %include './bbddm/ccta_gpreun.sas';
        NOTE: Data File C:/sas/ncs/ccta_hplus_score.sas is in a format that is native to another host, or the file encoding does not match the
        session encoding. Check the Import Data screen will be used, which might require additional CPU resources and might reduce
        performance.
        NOTE: PROCEDURE LOG used (Total process time):
        Real Time: 0.00 seconds
        CPU time: 0.01 seconds
        10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000
        10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000 10:00:00.0000000000
    
```

Initial Exploration and Standardization of Variables

- Use the [CONTENTS](#) procedure to see the names, types, sizes of variables
- Use the [HTITLE](#) procedure to create a new dataset name `acta_base` in the WORK directory based on the `acta_base` dataset found in our `C_DATA` library. Do the same for the `CCTA_NEW` dataset

```

In [1]: proc contents data=c_data.ccta_base; run;
        proc stdize data=c_data.ccta_base out=ccta_base;
            var b;
        run;
        proc stdize data=c_data.ccta_new out=ccta_new;
            var b;
        run;

Last executed on Fri, Oct 30 2018 at:
    
```

The CONTENTS Procedure

Data Set Name
Member Type
Engine
Created
Last Modified

Using the ABC method in this call we use the following between 2 and 18 codes

```

In [1]: ods select none;
        data=ccta_base;
        maxclusters=10;
        maxiters=100;
        seed=1978;
        NOC ABCB=1 mir;
        code %ile=s_hpc;
        id ccta;
        output b; %level=1;
        ods output ABCSt;

run;
proc sgplot;
    data= ABC;
    scatter 'm k y' t;
    axis grid integ;
    yaxis label= 'AB';

run;

Last executed on Fri, Oct 30 2018 at:
    
```

IPython kernels for other languages

Bo edited this page 21 hours ago · 124 revisions

IPython/Jupyter kernels:

The Kernel Zero, is of course IPython, which you can get through [ipykernel](#), and still comes (for now) as a dependency of [jupyter](#). The IPython kernel can be thought as a reference implementation, here are other available kernels:

Name	Jupyter/IPython Version	Language(s) Version	3rd party dependencies	Example Notebooks
sas_kernel	Jupyter 4.0	python >= 3.3	SAS 9.4 or higher	
IPyKernel	Jupyter 4.0	python 2.7, >= 3.3	pyzmq	
Julia		julia >= 0.3		
IHaskell		ghc >= 7.6		
IRuby		ruby >= 2.1		
Ijavascript		nodejs >= 0.10		

Bitcoin Data from Quandl

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Home x
Secure | https://www.quandl.com

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Core Financial Data
Quandl delivers market data from hundreds of sources via API, or directly into Python, R, Excel and many other tools. Get the data you need in the format you want. **SEARCH DATA**

Use Python\Jupyter to wrangle and load to SAS\Viya

Home x
Bitcoin - no Waffle x
localhost:8000/user/sasdemo/notebooks/Bitcoin%20-%20no%20Waffle.ipynb#

jupyter Bitcoin - no Waffle Last Checkpoint a few seconds ago (autosaved) Control Panel Logout

```
File Edit View Insert Cell Kernel Widgets Help Trusted | Python 3
```

```
In [1]: import quandl
import swat
import getpass

In [2]: bitc=quandl.get("BCHARTS/BitcoinUSD", authToken="e-w6G@BoYABH24UP7s")

In [3]: bitc.columns=['Open','High','Low','Close','Volume_BTC','Volume_Currency','Weighted_Price']
bitc.reset_index(level=0, inplace=True)

In [4]: u = getpass.getpass(prompt='Username:')
p = getpass.getpass(prompt='Password:')
conn = swat.CAS('viya-uks.sas.com',5570,u,p)
Username:.....
Password:.....

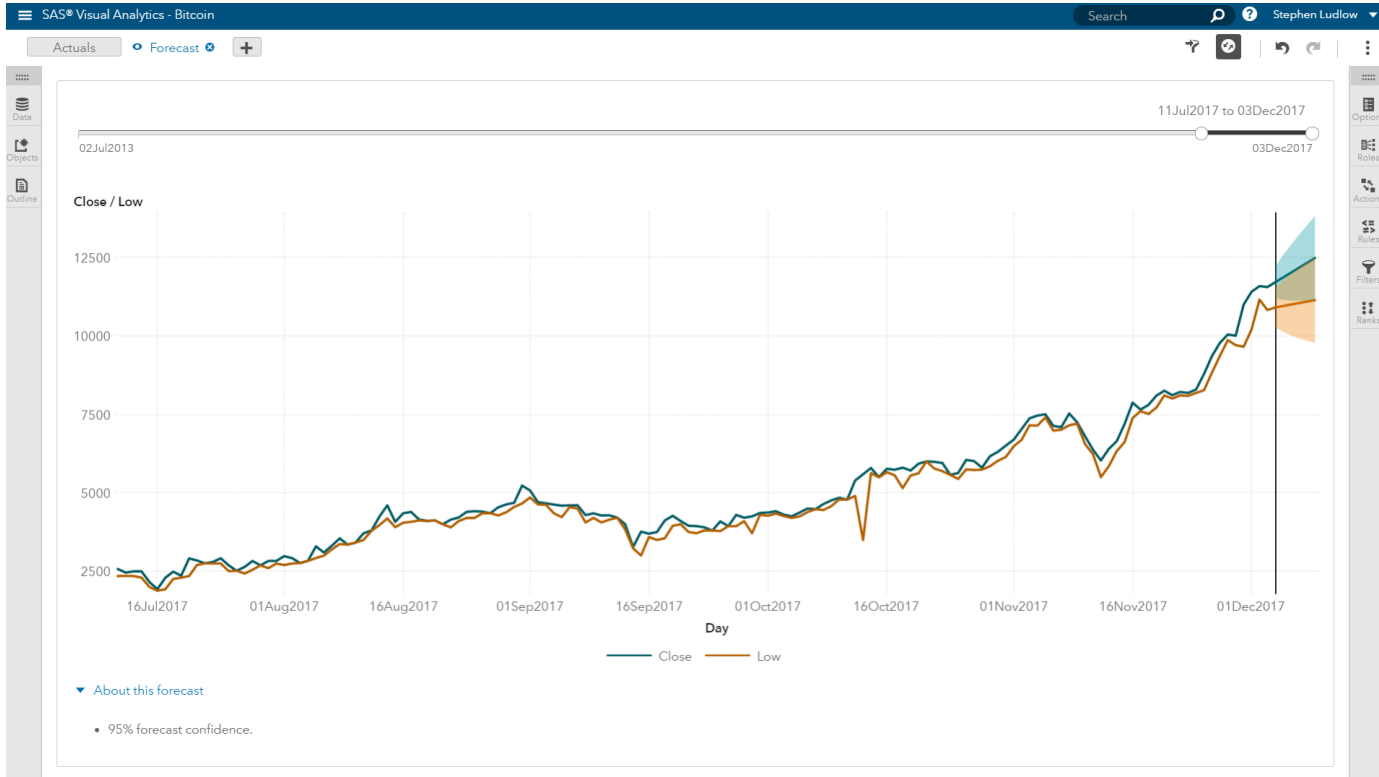
In [5]: conn.table.dropTable(caslib='G_CAS',name='BITC',quiet=True)
NOTE: Cloud Analytic Services dropped table BITC from caslib G_CAS.

Out[5]: elapsed 0.00190s user 0.00138s sys 0.000245s mem 0.0587MB

In [6]: finalbitc = conn.upload(bitc,casout=dict(name='bitc',caslib='G_CAS',promote='True'))['casTable']
NOTE: Cloud Analytic Services made the uploaded file available as table BITC in caslib G_CAS.
NOTE: The table BITC has been created in caslib G_CAS from binary data uploaded to Cloud Analytic Services.

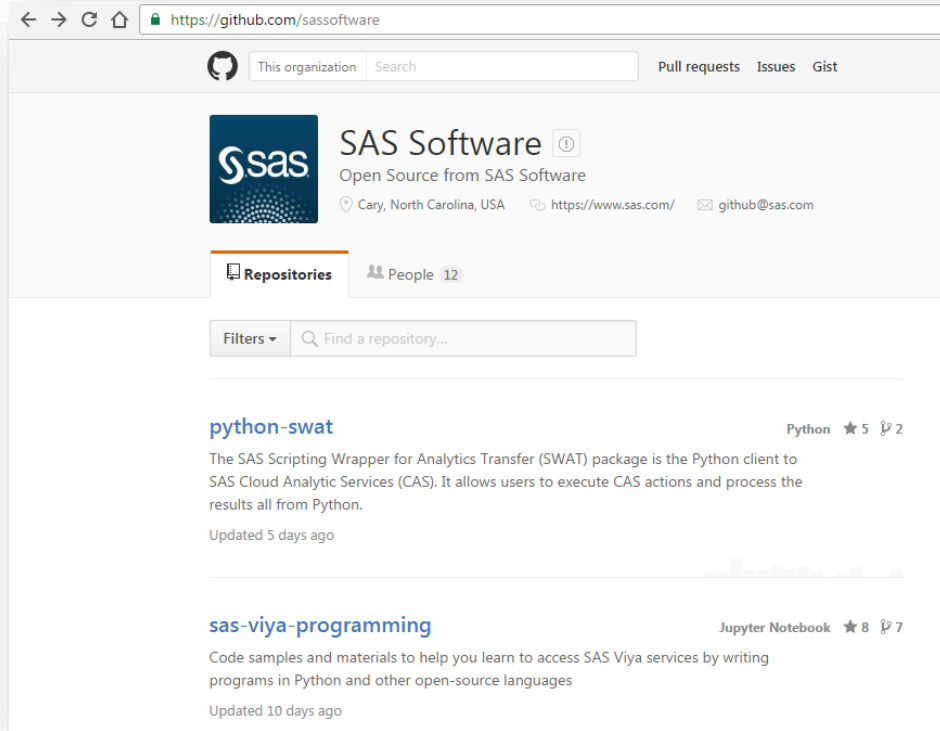
In [7]: import time
print (time.strftime("%d/%m/%Y"))
print (time.strftime("%H:%M:%S"))
04/12/2017
11:33:24
```

Exploit in Python\R\REST etc. or SAS





Demo



SAS kernel for Jupyter Notebook:

https://github.com/sassoftware/sas_kernel

SAS Cell Magic for Python:

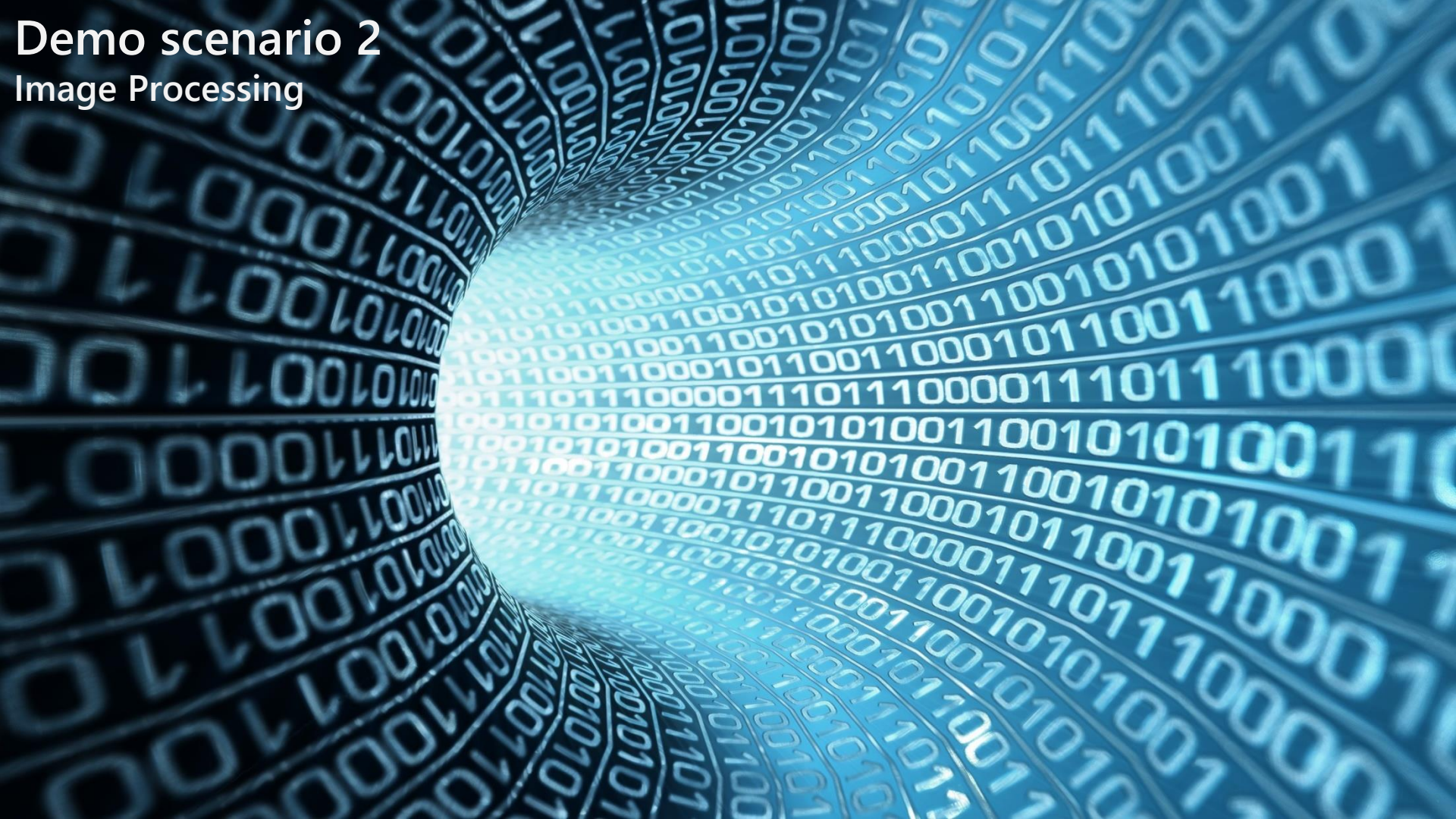
<https://github.com/sassoftware/saspy>

SAS Viya Open API for Python:

<https://github.com/sassoftware/python-swat>

Demo scenario 2

Image Processing

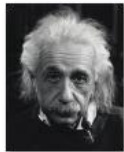




Abraham
Lincoln.jpg



Al_Gore.jpg



Albert
Einstein.jpg



Alfred_Hitchcock.
jpg



Angelina_Jolie.jp
g



Anthony_Hopkins
.jpg



Audrey_Hepburn.
jpg



Bill_Clinton.jpeg



Bill_Gates.jpg



Bob_Dylan.jpg



Brad_Pitt.jpg



Daniel_Craig.jpg



David_Beckham.j
pg



Dian_Princess_of_
Wales.jpg



Elvis_Presley.jpg



George_Clooney.j
pg



Harry_Styles.jpg



helen.png



image.jpg



Jim_Carrey.jpg



John_F_Kennedy.j
pg



Lance_Armstrong.
jpg



Lord_Nick_Stern.j
pg



Madonna.jpg



nophoto.jpg



Obama.jpg



Peter_Sellers.jpg



Stephen_Hawkin



Steven



Sting.jpg



sukabc.jpg



sukjhs.jpg



sukjmt.jpg



sukjro.jpg



sukkst.jpg



sukppj.jpg

Top Image

```
In [23]: ...[': 'DESCENDING'}],  
Out[23]: ...['name': '_reference_id_']], to=1)
```



below path - need to get _reference_id into the

```
In [25]: r = s.image.loadImages(casou  
path=  
imageTable = s.CASTable('fam  
imageShow(imageTable, 0, 1)  
print(r)
```

NOTE: Loaded 1 image from /o
_match.
+ Elapsed: 0.0038s, user: 0.





Demo

SAS – Market Perception





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SAS AS an open platform

- ✓ Not an OR but AND decision
- ✓ All resources are utilized and more people are enabled for analytics
- ✓ Data scientists can code in their language of choice
- ✓ IT can have governance and lineage over the data and models
- ✓ Access to SAS' scalable and fault-tolerant, in-memory analytics server
- ✓ Streamlined deployment



Q + A