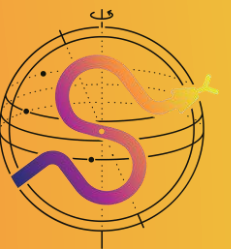


2. Python in Excel: Use Python directly in spreadsheets



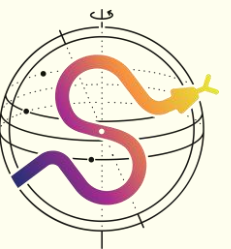
Macros refine data

- Spreadsheets
- Macros
- actions of
- Can have
- VBA or
- was for



or functions
advanced

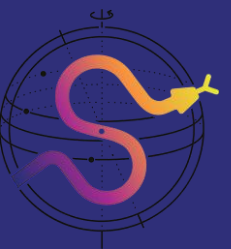
all there



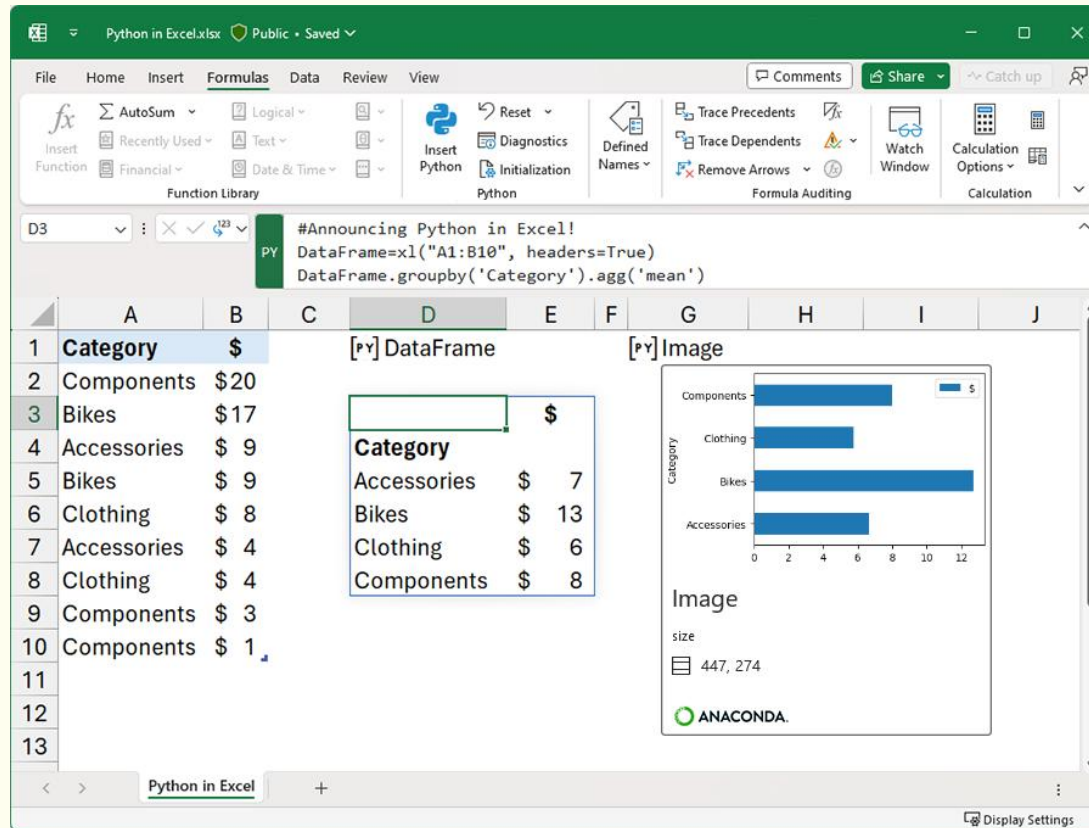
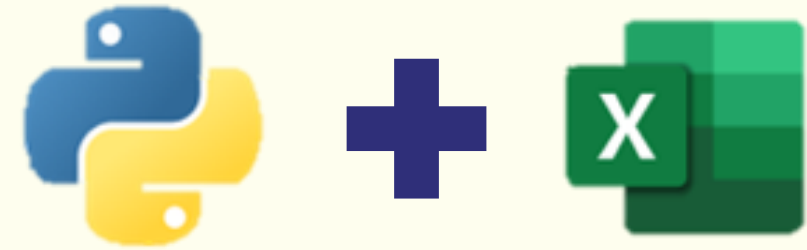
DON'T WANT TO LEARN VBA?



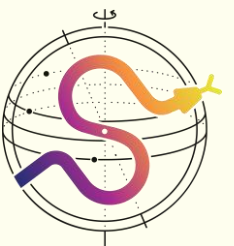
WHY NOT PYTHON?



Python in Excel

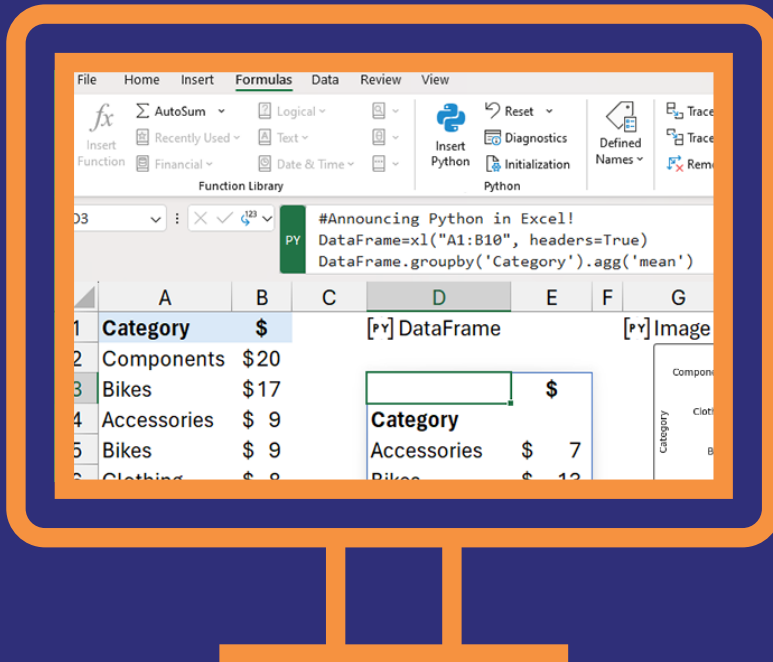


- Newish add-on feature of Excel that allows you run Python directly in the cell
- Add Python to existing workflows and analyses without creating new “projects”

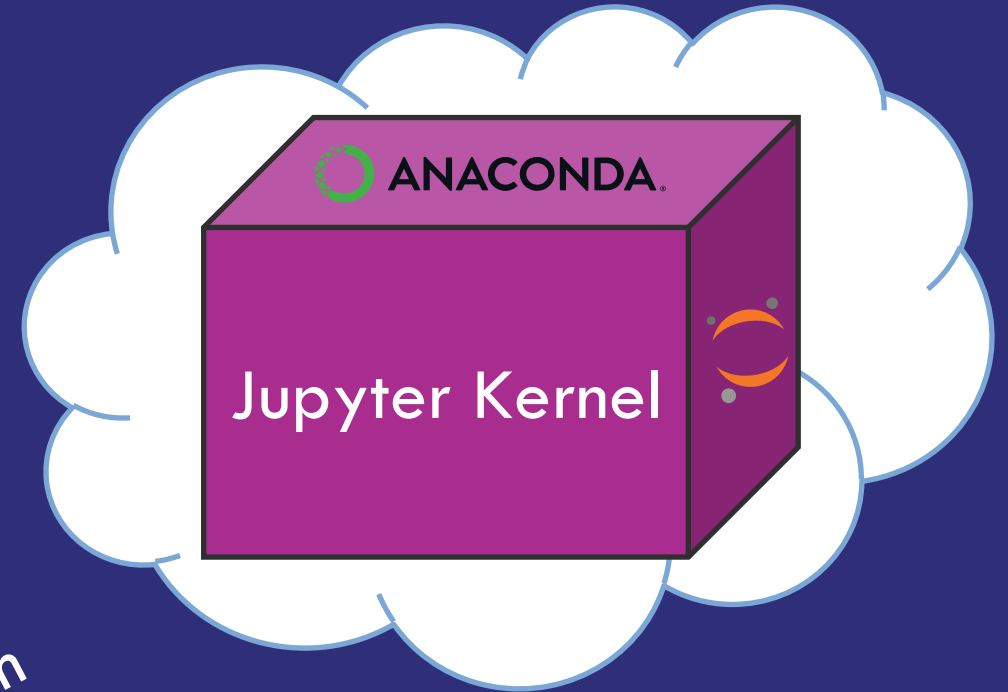


How does it work?

Code cells are turned into a Jupyter notebook cells and run it in a cloud container



Data is exchanged with container from Excel via x1 package



The container stay online as long as the workbook is open or until a timeout occurs.



Easy collaboration, no setup

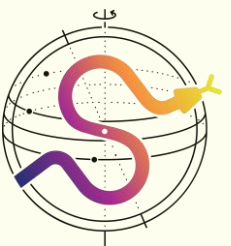
The screenshot displays a collaborative data analysis interface. On the left, a spreadsheet titled 'xl("salesData")' is open, showing a table with columns: Product, Region, Discount, Sales, and Quantity. The 'Product' column is highlighted with a purple box, and a 'CO' (comment) icon is visible next to the first row. Above the table, there are tabs for 'DataFrame', 'Image', and 'Series'. The 'Series' tab is active, and a blue box with 'AG' is next to it. On the right, a 'Comments' panel is open, showing two comments. The first comment is from Chris Cross (@Arlo Gaitaca) asking 'How does this analysis look?' and the second is from Chris Cross (@Cole Orti) asking 'Any edits to the visualization?'. Both comments have a reply box labeled '@mention or reply'.

Product	Region	Discount	Sales	Quantity
Road Bikes	North	Yes	\$ 8	87
Road Bikes	South	Yes	\$ 6	97
Road Bikes	West	Yes	\$ 5	90
Mountain Bikes	North	Yes	\$ 11	63
Mountain Bikes	West	No	\$ 8	82
Mountain Bikes	South	Yes	\$ 9	77
Wheels	North	No	\$ 2	120
Wheels	West	Yes	\$ 3	110
Wheels	South	Yes	\$ 2	103

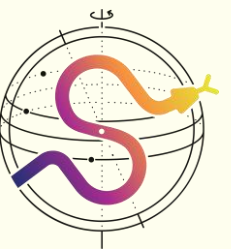
Comments

Chris Cross B2
@Arlo Gaitaca How does this analysis look?
@mention or reply

Chris Cross D2
@Cole Orti Any edits to the visualization?
August 16, 2023, 2:26 PM
@mention or reply



But what packages do I get?



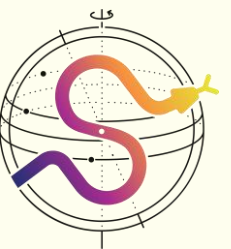


```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import seaborn as sns
import statsmodels as sm
```


More great packages!

Python in Excel comes with a standard set of Python libraries provided by  ANACONDA through a secure distribution.

<u>Astropy</u>	<u>NLTK</u>	<u>qrcode</u>	<u>tabulate</u>
<u>beautifulsoup4</u>	<u>NumPy</u>	<u>scikit-learn</u>	<u>TheFuzz</u>
<u>Faker</u>	<u>pandas</u>	<u>SciPy</u>	<u>wordcloud</u>
<u>imbalanced-learn</u>	<u>Pillow</u>	<u>seaborn</u>	
<u>IPython</u>	<u>plotnine</u>	<u>snowballstemmer</u>	
<u>Matplotlib</u>	<u>Prince</u>	<u>squarify</u>	
<u>mlxtend</u>	<u>PyTables</u>	<u>statsmodels</u>	
<u>NetworkX</u>	<u>PyWavelets</u>	<u>SymPy</u>	



Remote Execution

Python code runs on hypervisor isolated containers built on Azure Container Instances.

Trusted Packaging

The container has Python and a curated set of secured libraries provided by Anaconda.

Secure Devices

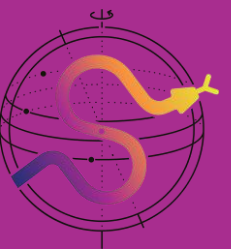
No local disk access, user token, or network access.

Easy Collaboration

Connected to other tools like OneDrive, Advanced Analysis, sharing links, etc.



Let's look at a demo!



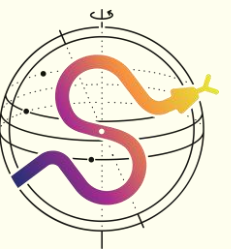
Python in Excel tradeoffs

Advantages

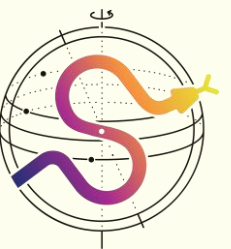
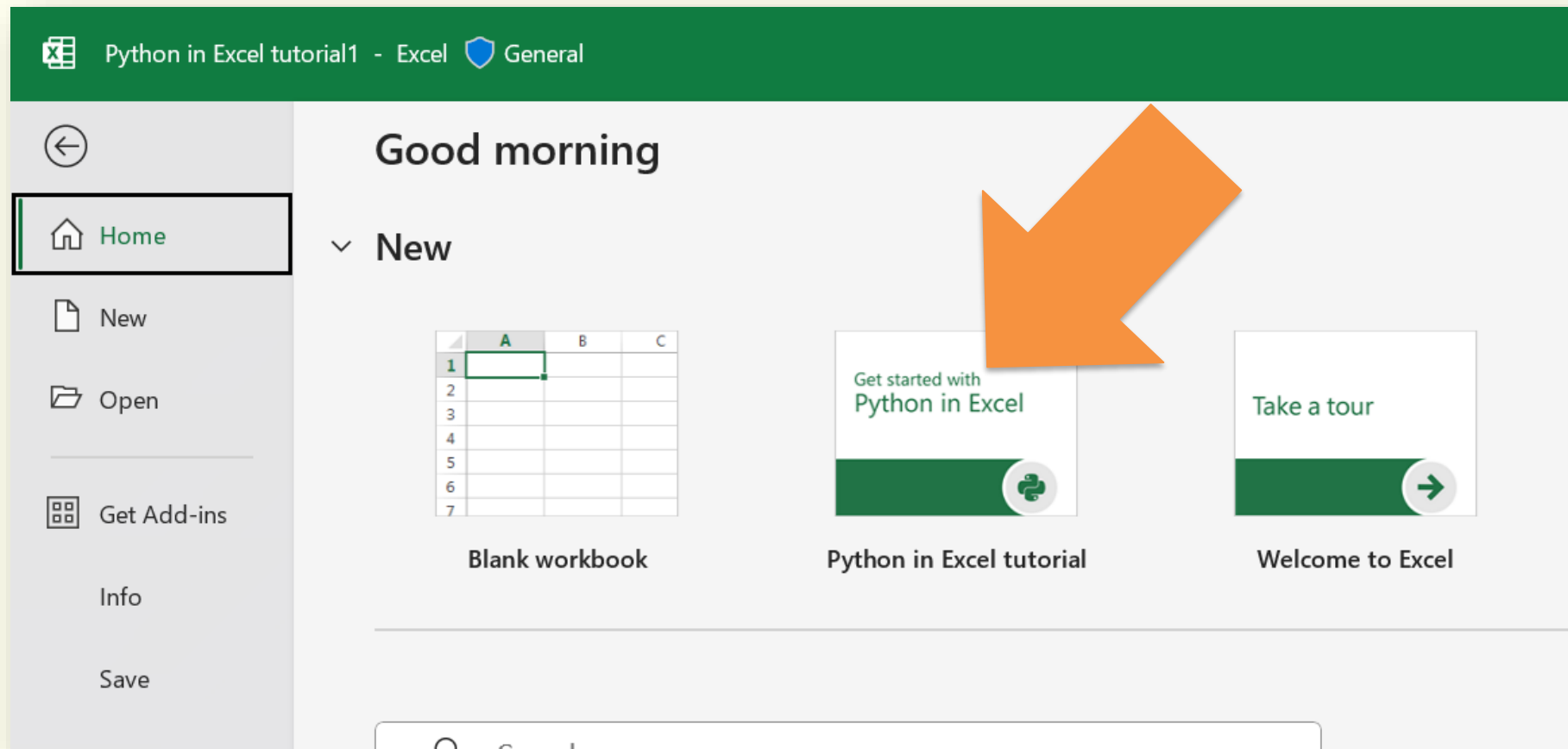
- Highly vetted, secure environments to run code on the cloud
- Interoperates with other 365 experience tools like live editing, share links, and comments
- Copilot integration

Limitations

- Need network access to use Python and can't access internet in cloud container to get data
- Supports a small subset of the extensive Python package ecosystem
- Current data size limit (~100MB)



Fantastic built-in reference for all things Python in Excel



Exercise: Packages in Python in Excel

1. In the tutorial repo, download `python-in-excel.xlsx` which in Library Index sheet has a list of the packages in the current Python in Excel environment.
2. Pick one of the non-core libraries and in a new sheet create a code sample of using that library in Excel. Checking out the package docs for a tutorial is a good start!



aka.ms/scipy-sheets

