# Troubleshooting Python Issues in ArcGIS Desktop

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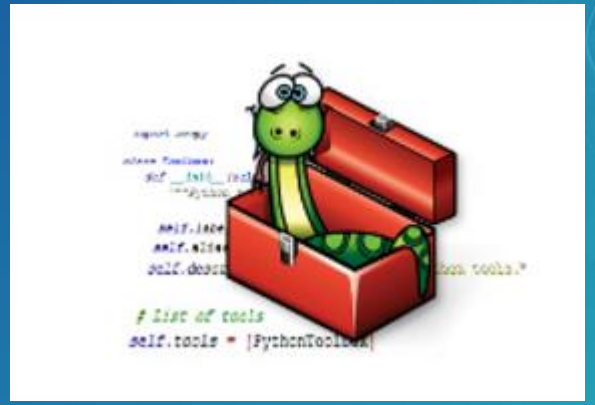
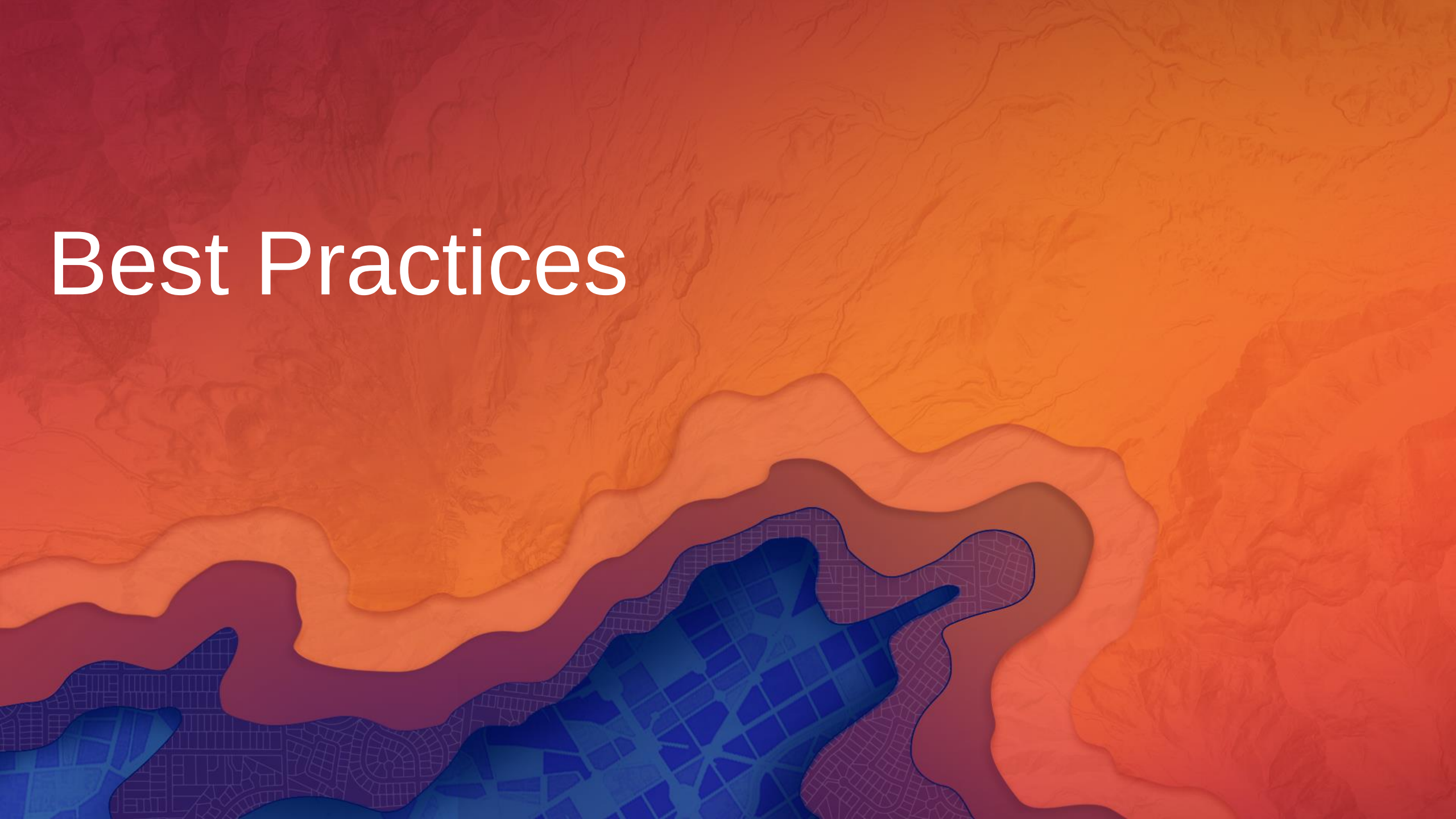
# Agenda

- Best Practices/How To
- Troubleshooting Tips

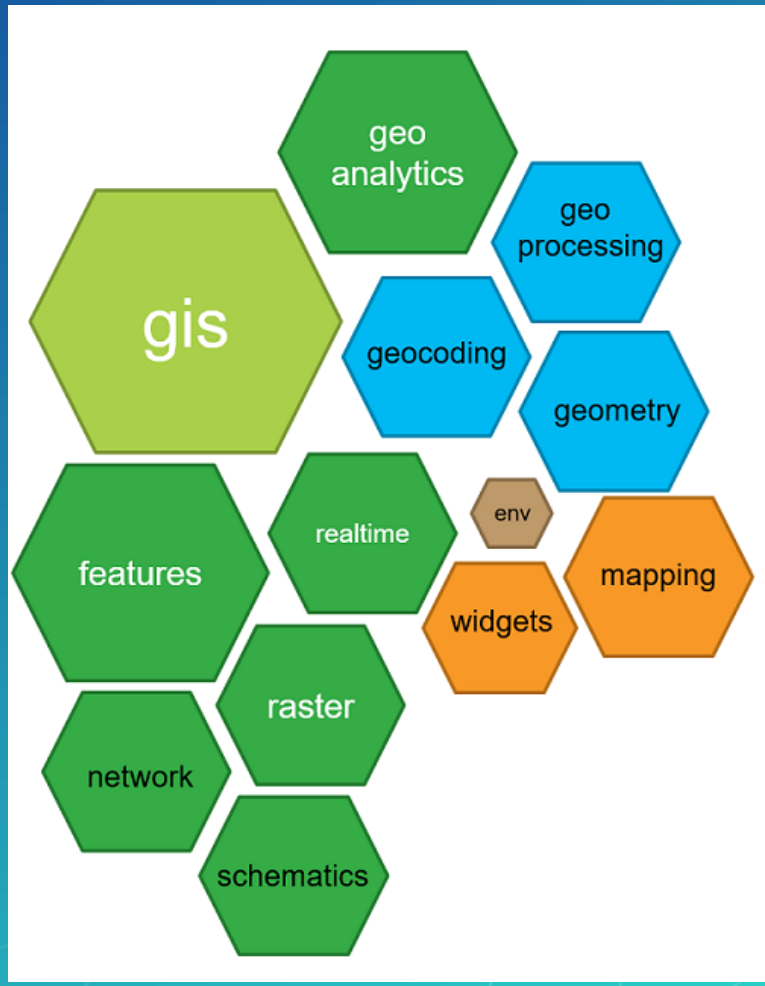


# Best Practices



# Where to start?

- **Two technologies for scripting and automation**
  - **Arcpy**
    - **Desktop based for ArcGIS Pro and ArcMap**
    - **Windows environment**
  - **ArcGIS API for Python**
    - **Online/Portal based**
    - **Windows/Mac/Linux environment**



# IDE’s

- Use preferred IDE
  - IDLE
  - PyCharm
  - Visual Studio
    - Visual Studio Community
    - Visual Studio Code
  - Pyscripter
  - Jupyter Notebook
  - ArcMap/ArcGIS Pro Python Window

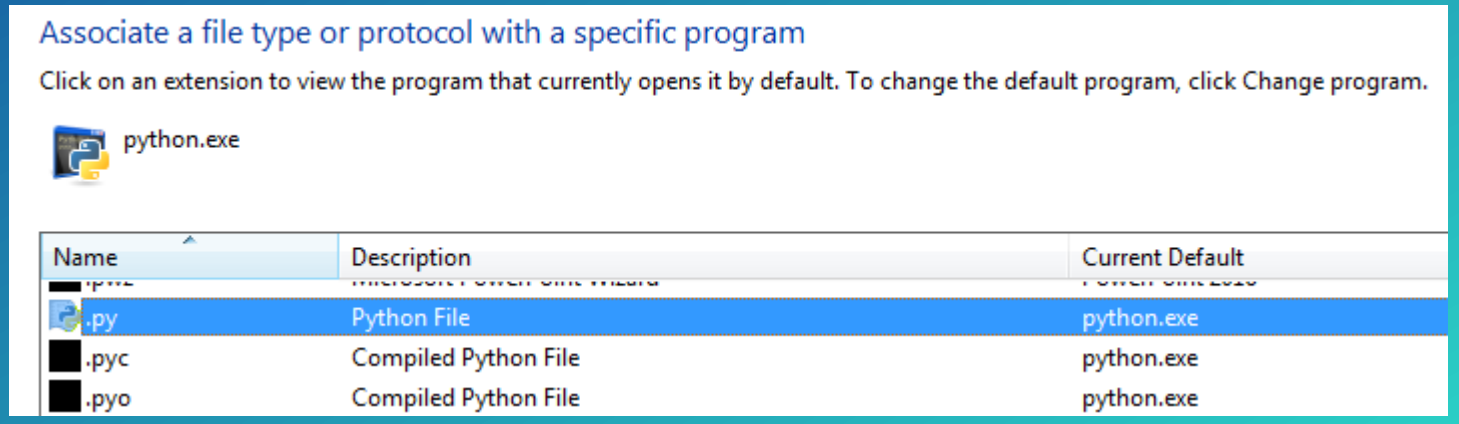
# Versions/Compatibility

| ArcMap 10.5.1 | Background GP | ArcGIS Pro 2.0 | ArcGIS Server 10.5.1 |
|---|---|---|---|
| 2.7.13 | 2.7.13 | 3.5.3 | 2.7.13 |
| 32 bit | 64 bit | 64 bit | 64 bit |

# Versions/ Compatibility

What if I have multiple versions of python on the same machine?

- Run from Command line
  - **C:\Python27\ArcGIS10.x\python.exe  C:\Temp\test.py**
- Batch File
  - **C:\Python27\ArcGIS10.x\python.exe  C:\Temp\test.py**
- Windows File Associations

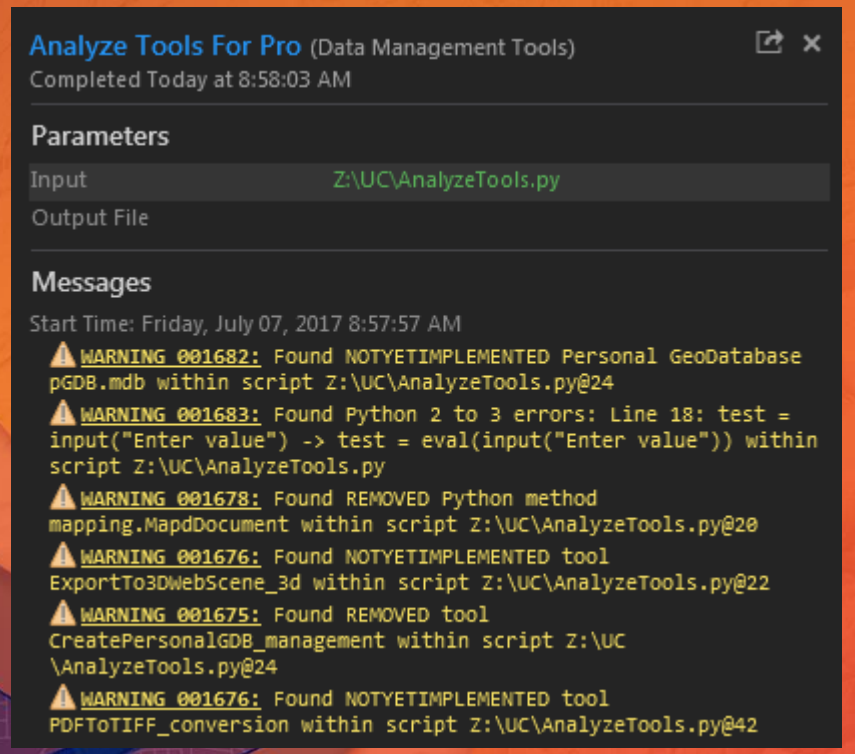


# Differences between Python 2 and 3

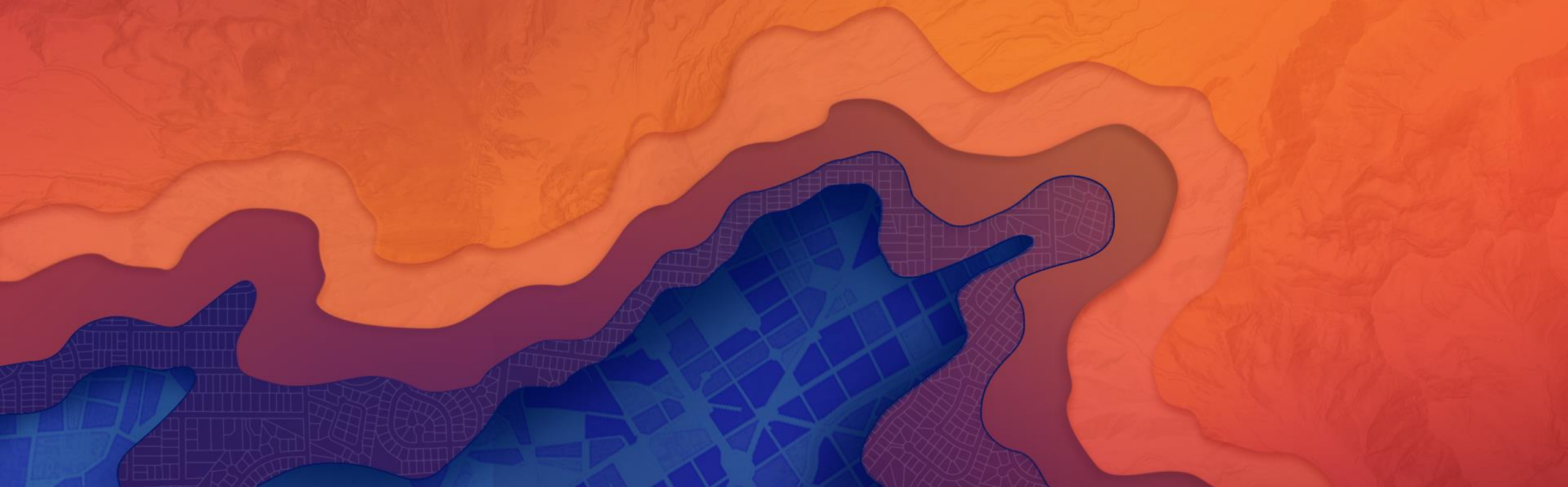
- Arcpy changes
  - (mp module instead of mapping module)
  - Unsupported tools
- Python changes
  - Print function
  - Input() instead of raw_input()
  - Range() instead of xrange()

- Utilities
  - Analyze Tools for Pro
  - Python 2 to 3
  - Recommend writing scripts for Python 3
  - From __future__ import division

# Demo: Python 2 to 3



# Troubleshooting ArcMap and ArcGIS Pro Environments



# Python Installation

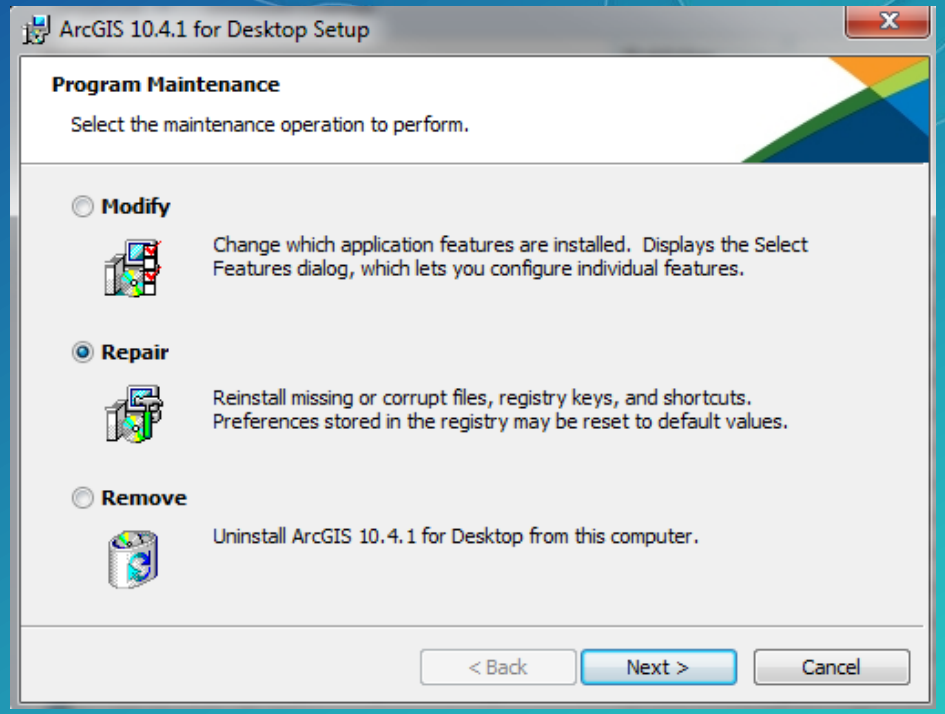
- **Possible corrupt python install?**

**ArcMap**

- **-Rename  C:\python27 and run a repair**
- **-Python27 folder will be rebuilt**

**ArcGIS Pro**

- **C:\Program Files\ArcGIS\Pro\bin\Python\envs\arcgispro-py3**
- **Rename Python folder and run a repair**



# Error Importing arcpy

- **Import Error: No module named arcpy**
  - **Check python version**
  - **Check desktop10x.pth**
    - C:\Program Files (x86)\ArcGIS\Desktop10.x\bin

      C:\Program Files (x86)\ArcGIS\Desktop10.x\ArcPy

      C:\Program Files (x86)\ArcGIS\Desktop10.x\ArcToolbox\Scripts
  - **Check environment variable**
    - **Path**
    - **PythonPath**

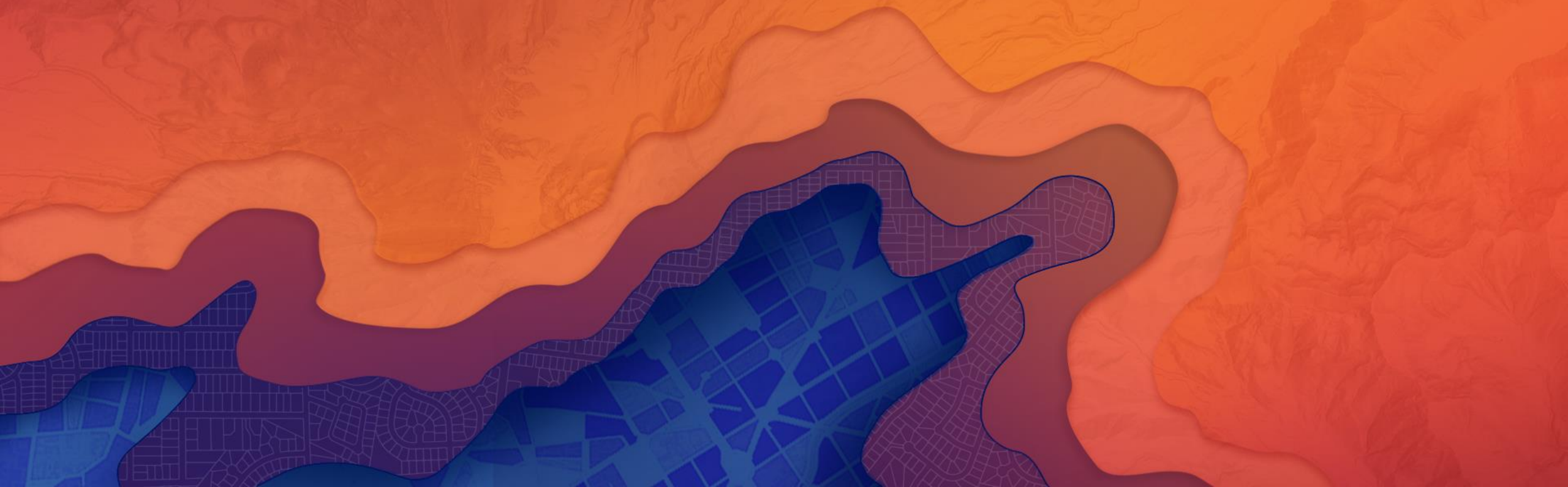
```
Traceback (most recent call last):
  File "<interactive input>", line 1, in <module>
ImportError: No module named arcpy
```

# Python Options

- C:\Python27\ArcGIS10.5\python.exe –v
  - Prints out the location of the filename or built-in module

- C:\Python27\ArcGIS10.5\python.exe –E
  - Ignores all python environment variables (PYTHONPATH, PYTHONHOME)

# Demo: Path file and Python verbose

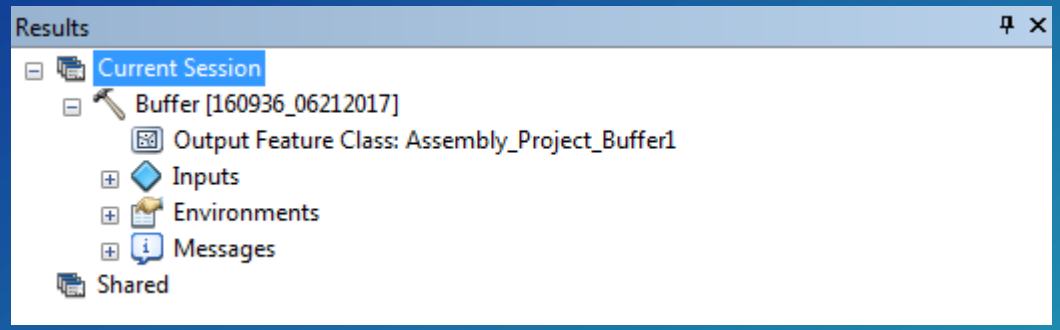


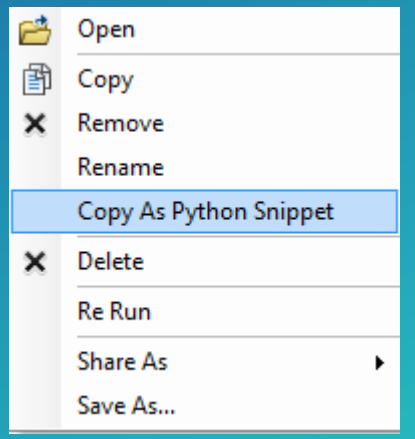
# Standalone Script

- **Running into an out of memory error?**
  - **Run in python window in ArcMap**
  - **Run against 64 bit exe**

# Syntax Issues?

- **Copy as Python Snippet via the Results window**





# String formatting?

- Print(“your name is {0} and you are {1} years old”.format(name,age))

- oracle_id = 8
- arcpy.SelectLayerByAttribute_management(in_layer_or_view="fclayer", selection_type="NEW_SELECTION", where_clause="ID = {0}".format(oracle_id))

# Demo: Copy Python Snippet

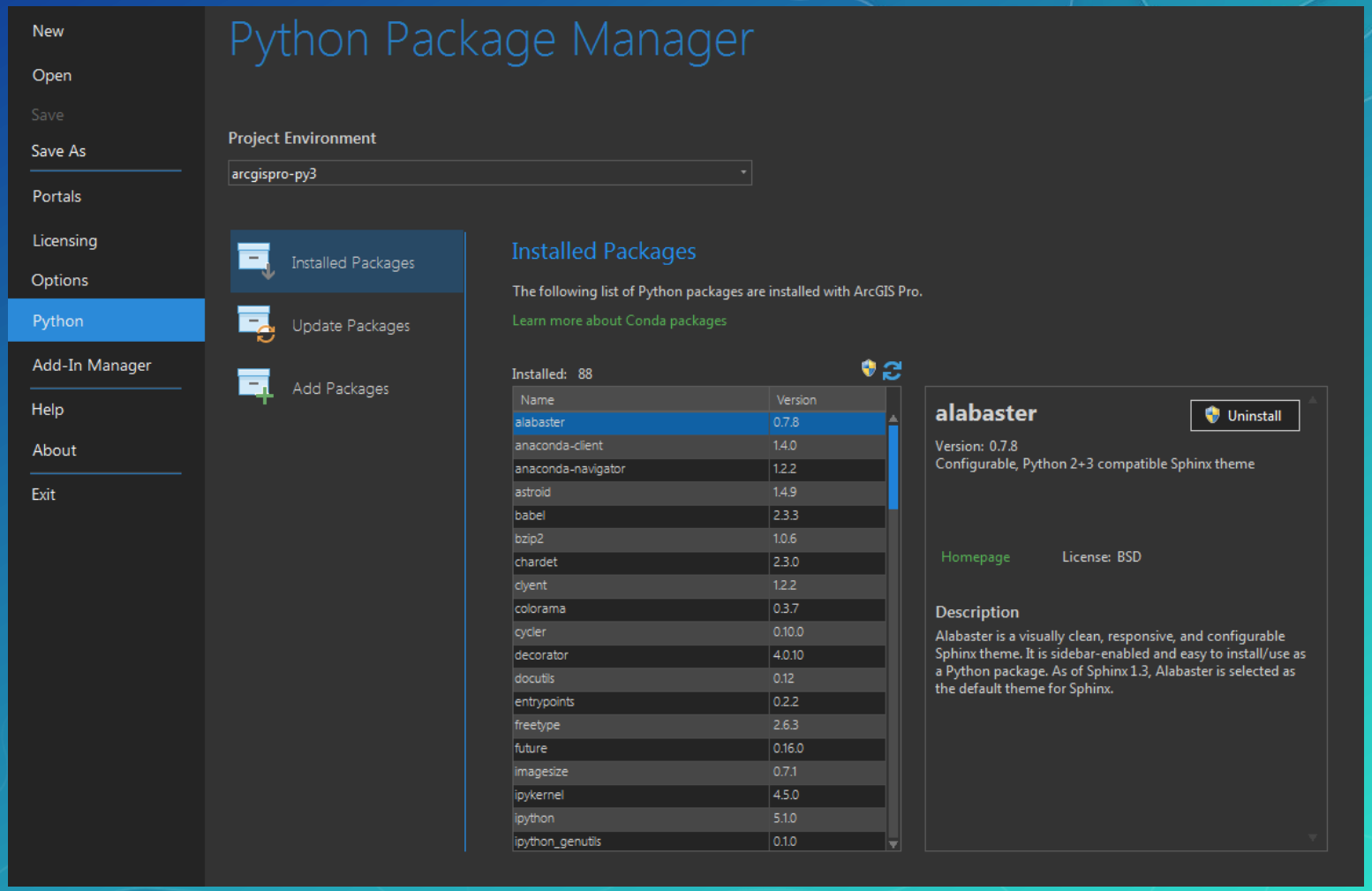
# ArcGIS Pro Python Environment

# Python in ArcGIS Pro

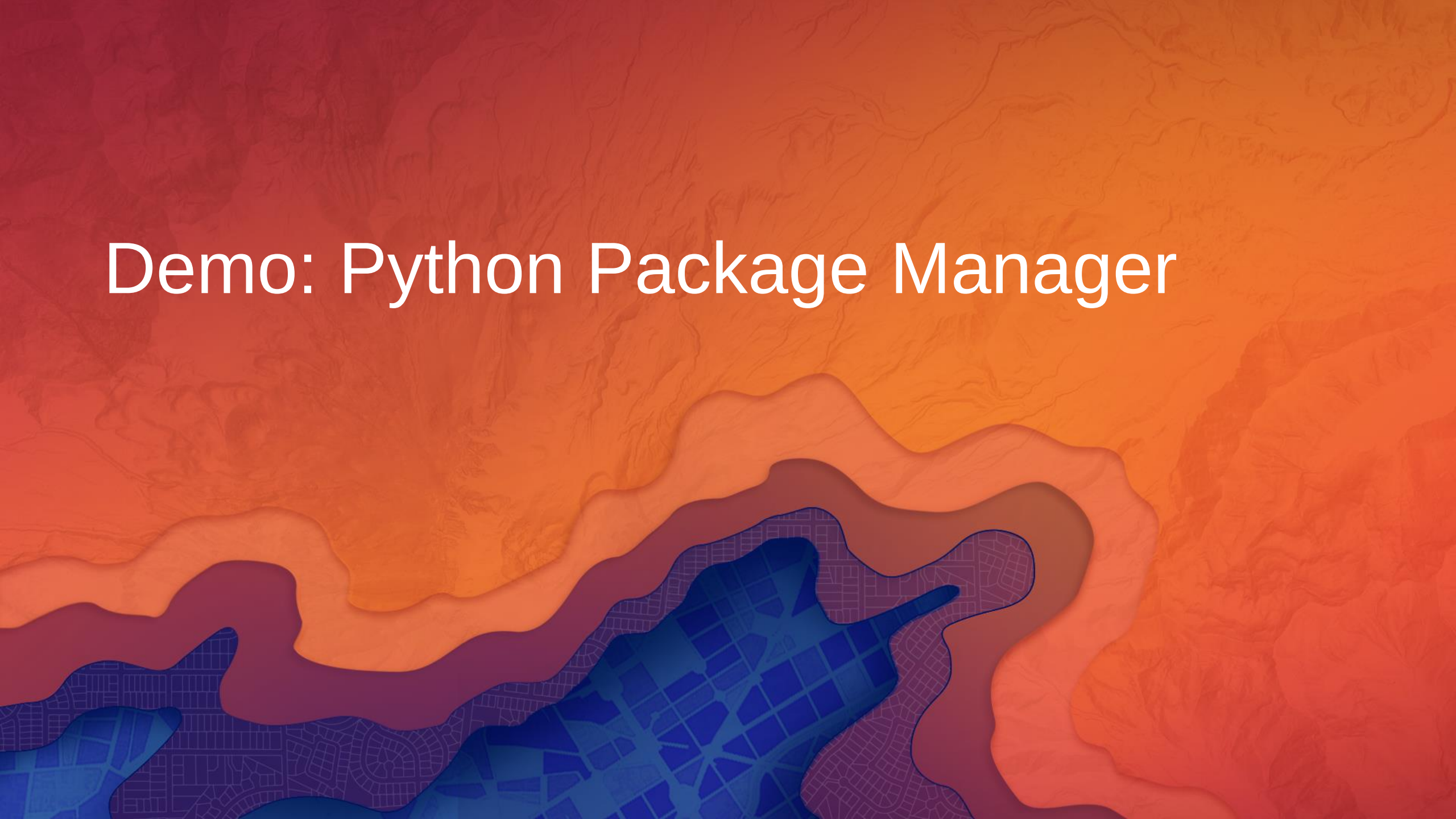
- Python has a rich ecosystem of preexisting packages, but managing all of these packages can be a headache, especially when sharing code with others
  - To solve this, ArcGIS Pro leverages Conda, the most popular Python package manager
    - Supports installing third-party libraries associated with a single project rather than into the base Python installation
    - Conda does this by providing isolated Python environments with only the desired packages installed

# Python Package Manager

- Interface for managing installed Python packages in ArcGIS Pro's Conda environment

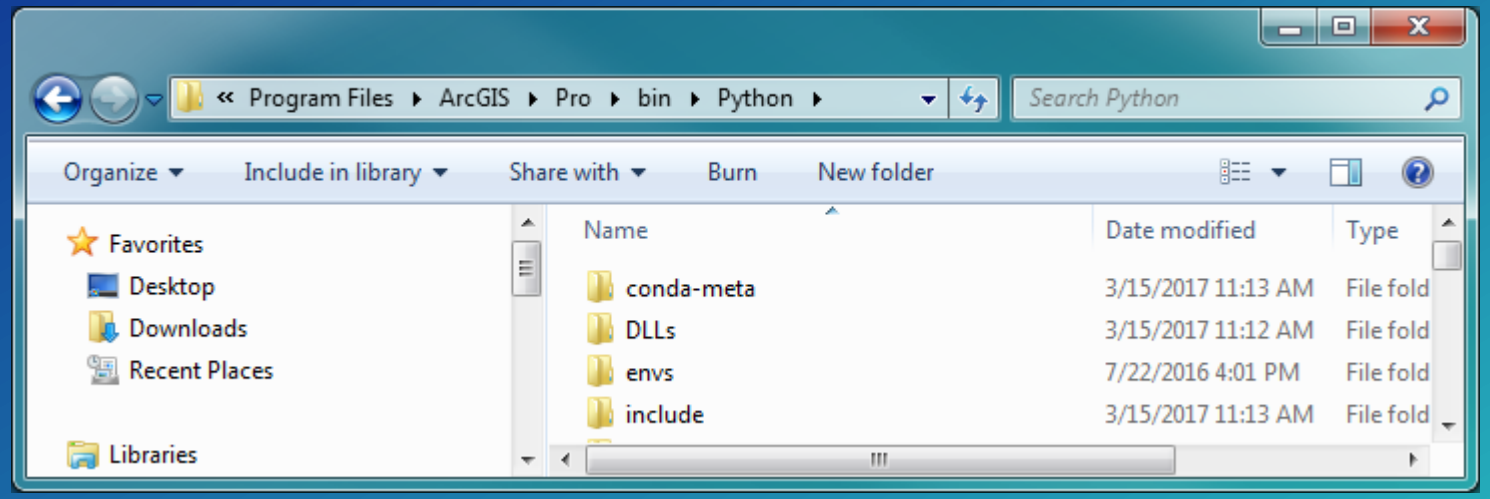


# Demo: Python Package Manager



# Python, Conda, and ArcGIS Pro

- ArcGIS Pro installs a conda-based Python environment into Pro's install folders



# Running Python scripts for Pro

- A script that used to work now fails?
  - Use propy.bat to run the script, not the python34.exe from earlier versions of Pro
    - Use "c:\Program Files\ArcGIS\Pro\bin\Python\scripts\propy.bat" my_script.py
    - Instead of “c:\python34\python.exe” my_script.py
    - Propy.bat includes all the packages actively being used by ArcGIS Pro (those installed in the Package Manager), whereas python34.exe does not.
      - Note! Propy.bat requires Admin privileges

# Stuck?

## Self help

- Check your syntax
- Move data to local folder
- Use print statements
- Geonet, StackExchange, GitHub
- ArcScripts
  - Codesharing.arcgis.com

## Ask Esri for help

- Simplest testable case
- Create GP package in ArcMap (for script tools)
- What error message? On what line?

# Additional UC Sessions

- ArcGIS Python API: Introduction to Scripting your Web GIS - Wednesday July 12
  - 10:15am-11:30am Sapphire Ballroom M
- Python: Arcpy Tips and Tricks - Wednesday July 12
  - 1:30pm-2:15pm SDCC Demo Theater 07
- Python: An Introduction -Thursday July 13
  - 1:30pm-2:45pm SDCC Room 4
- Working with Python in ArcGIS Pro - Thursday July 13
  - 10:00am-10:30am  SDCC Tech Theater 19 Exhibit Hall A

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