

Automating your Web GIS with *arcpy* and the Python API

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https://github.com/EsriCanada/python_stuff



Schedule

1. Targeted audience
2. Introduction to Python
3. Uses of Python in ArcGIS
 1. Hidden gem: Python in the Field Calculator
 2. Copy geoprocessing results to Python snippet
 3. Standalone python scripts
 4. Integrating scripts to toolboxes → Deploying tools
 1. Geoprocessing Services publication
 5. ArcGIS API for Python
4. Resources
5. Questions

Targeted audience

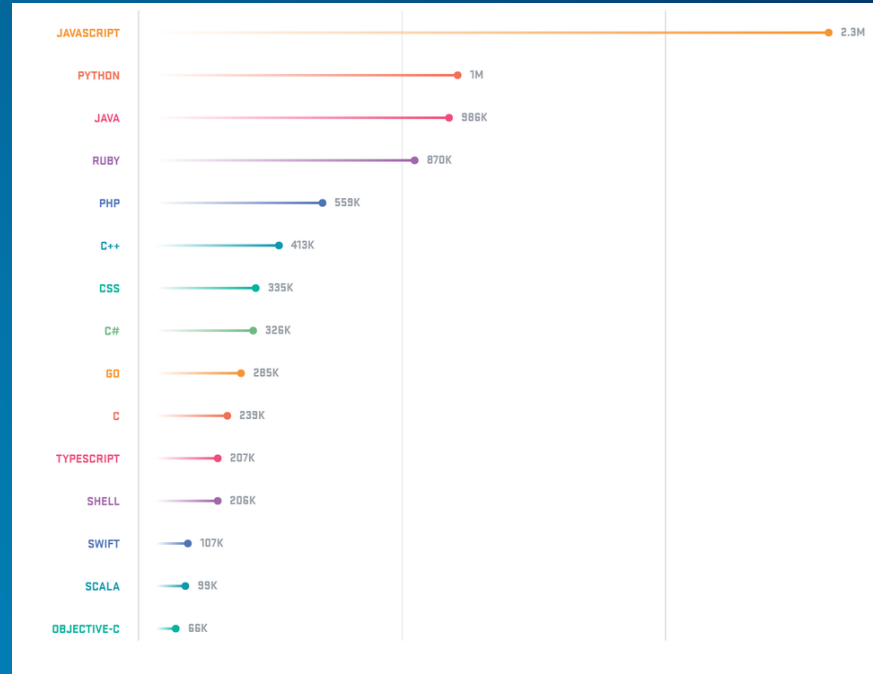
- GIS professionals
- Content managers
- Inexistent to intermediate programming knowledge
- Python is easy and quick to learn!

If you sometimes want to do something that seems simple, but ends up being really complex with a lot of data handling, you might be suffering from a lack of python knowledge

What is Python



- Interpreted and object-oriented high-level programming language
- Easy, simple to learn
- Highly modular
- No compilation required



Source: Github

Use 1. Field Calculator

- Calculating values can be hard with a single-line statement
- Define your own codeblocks (functions)
- Allow to do some really awesome calculations

When should you use the Field Calculator?

- 1) Will you perform the process once or a few times only?
 - If yes → Field Calculator
 - If no → You should write a script

- 2) Does the calculation depend on a single feature class/table?
 - If yes, only one table/feature class is depended on → Field Calculator
 - If no, you need to alter fields from a layer based on another layer → You should write a script

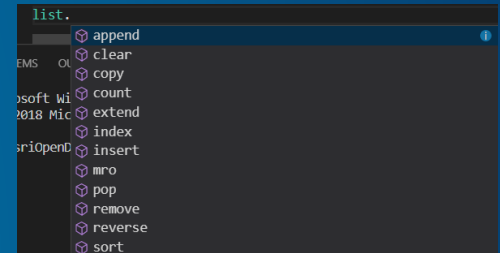
Field Calculator Demo

Use 2. Copy results to Python

- Easy to start coding
- Automate simple tasks
- Save lots of time digging into the documentation
- Sequence different operations into a script
- Make use of the Task Scheduler

When should you Copy results to Python Snippet?

- You are not familiar with coding in Python
- You plan to repeat the same task without changing the parameters (for example: Compress database).
- You are not familiar with the *arcpy* library
- Your text editor does not support Intellisense.



3. ArcGIS Pro Python console

- Python built-in ArcGIS Pro!
- You can perform one-time processes
- You can test/debug scripts
- You run scripts

- **ArcGIS Pro Python console and snippets Demo**

4. Standalone scripts

- **Import custom libraries**
- **Environment variables**
- **Create libraries and reuse code**
- **Good for batch files**
- **Allows « task scheduler » to automate processes (e.g. daily, at 8am)**
- **You should use if you don't need parameters**

Standalone Script demo

5. Integrating scripts to Toolboxes

- Add parameters to make your tool dynamic
- Define parameters in ArcGIS
- To reference or not to reference your code?
- Allow everyone to use complex tools without programming knowledge
- Save tons of time for everyone in the office
- Share your toolboxes with colleagues around the world

Adding scripts to toolboxes Demo

6.The ArcGIS API for Python

- Python library for working with web maps and geospatial data
- Powered by web GIS
- Vector and raster analysis
- Geocoding, map making, routing, directions
- Managing a complete GIS with users, groups and information items.
- Access your maps

Python API: How to use it?

- If you have ArcGIS Pro 2.1 installed: it comes with it!
- Otherwise, install Conda package manager and the *arcgis* package from the ArcGIS Pro « package manager » or *pip*.
- Jupyter-Notebooks are accessible from:
- *Program Files\ArcGIS\Pro\bin\Python\envs\arcgispro-py3\Scripts*
- Add to environment variables and allow to call Jupyter-Notebook from any folder

ArcGIS API for Python - Demo

Arcpy vs ArcGIS API

- **Is the ArcGIS API the future of Arcpy?**
- **No!**
- **Will Arcpy disappear?**
- **No!**
- **They work perfectly conjunctly!**

- **Example: Manage your local data with arcpy, and interface with your web GIS with the Arcgis API.**

Resources

- Arcpy:
<http://desktop.arcgis.com/fr/arcmap/latest/analyze/arcpy/what-is-arcpy-.htm>
- ArcGIS API for Python: <https://developers.arcgis.com/python/>
- ArcGIS for Developers:
<https://developers.arcgis.com>

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