

# Useful Python Libraries

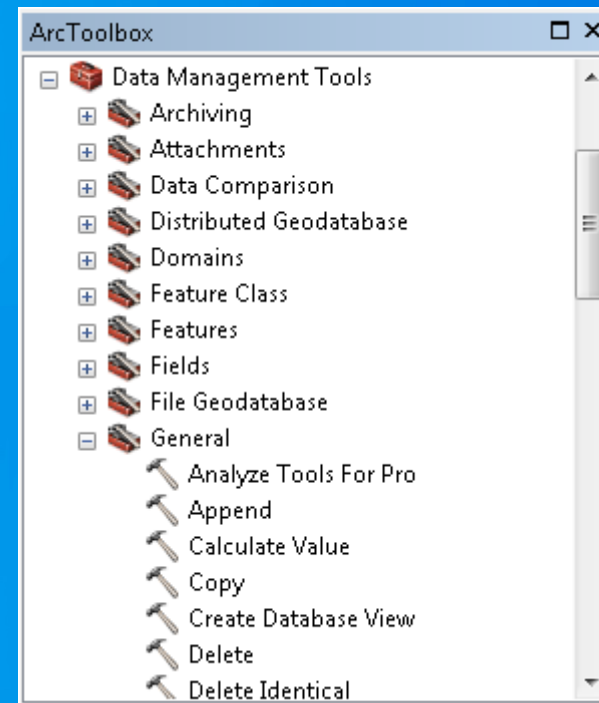
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# This presentation

- **Standard libraries**
  - “batteries included”
- **3<sup>rd</sup> party libs**

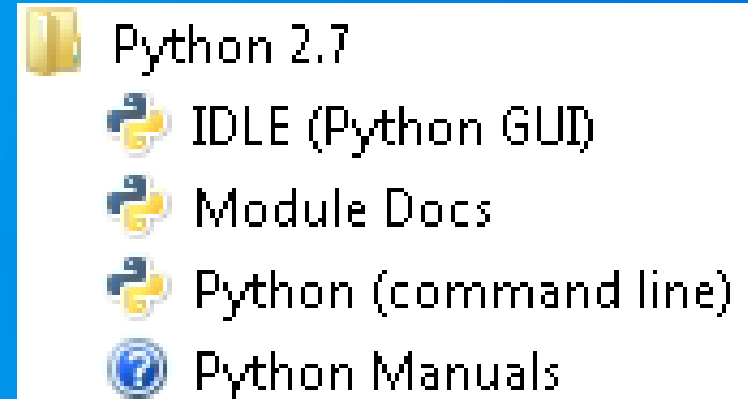
## Regarding python 3

- [docs.python.org/2/library/2to3.html](https://docs.python.org/2/library/2to3.html)
- “Analyze tools for Pro” tool
- Future : pick you python (Conda)



# Standard Library is Large, powerful and Well-Documented

- [docs.python.org](https://docs.python.org)
- Installed with ArcGIS



## 3<sup>rd</sup> Party Library

- Not part of standard library
- Pypi – the Python Package Index
  - 60,000+ packages
  - <https://pypi.python.org/pypi>
  - pip
- `C:\>c:\Python27\ArcGIS10.3\Scripts\pip.exe install requests`
- `Downloading requests-2.7.0-py2.py3-none-any.whl (470kB)`
- `100% |#####| 471kB 718kB/s`
- `Installing collected packages: requests`
- `Successfully installed requests-2.7.0`

# Data Formats

- XML
- JSON
- CSV
- Excel
- PDF
- Numpy/Pandas\*
- NetCDF

## 3 XML options within the standard library

- **SAX**
  - Can handle huge datasets
  - Hard to use, verbose code
- **DOM**
  - Familiar: Javascript uses the DOM
  - Easy (ish)
- **Etree**
  - Feels like python
  - Extremely easy and concise for common tasks

# JSON

- json module

```
>>> import json
>>> d = json.load(open("states.json", 'r'))
>>> print(type(d))
<class 'dict'>
```



# CSV & Excel

- **csv module**

```
>>> import csv
>>> with open('eggs.csv', 'rb') as csvfile:
...     spamreader = csv.reader(csvfile, delimiter=' ', quotechar='|')
...     for row in spamreader:
...         print ', '.join(row)
Spam, Spam, Spam, Spam, Spam, Baked Beans
Spam, Lovely Spam, Wonderful Spam
```

- **xlrd & xlwt (third-party, included in ArcGIS)**

# PDF

- **arcpy.mapping.PDFDocument**
- **reportlab (third-party)**
  - *allows rapid creation of rich PDF documents, and also creation of charts in a variety of bitmap and vector formats.*

# Networking

- **Calls to HTTP servers**
  - `urllib2`
  - `requests` (third-party, pip-install)
  - `asyncio`

# Computing

- Numpy
- Pandas \*
- Scipy \*
- Sympy \*
- R bridge (coming soon: [github.com/R-ArcGIS](https://github.com/R-ArcGIS) ... wait this isn't python at all)

- \* Pro 1.0 & planned for Desktop/Server 10.4

# Resources

[arcpy.wordpress.com](http://arcpy.wordpress.com)

[twitter.com/arcpy](https://twitter.com/arcpy)

[desktop.arcgis.com/en/desktop/](http://desktop.arcgis.com/en/desktop/)



Understanding our world.