What is Python

- Multipurpose language
  - Scripting
  - Object Oriented Programming
- 2.x vs 3.x
- Capabilities
  - Django
  - Dropbox
  - YouTube
  - Dropbox
  - EventBrite
- *NOT* ArcObjects
  - ArcObjects is the term for the Software Development Kit (SDK)
    - .NET SDK
    - Java SDK
  - Provides access to the geoprocessing capabilities of ArcGIS at a programmatic level

Python and ArcGIS

- Evolution from VBA
- ArcObjects, .NET SDK vs Python
- Future of Python with ArcGIS

Examples

- Python script in toolbox
  - AddressErrors
  - Huff Model
- Interpreter
  - ArcGIS
  - IDLE
- Text editor
  - Notepad++
  - Atom
- IDE
  - PythonWin
  - PyScripter
- Python Anywhere (pythonanywhere.com)
  - Online python interpreter
  - Hosting
  - Tutorials
  - Free beginner account

Quick Gotcha

- Indented code vs curly brackets
- Be consistent

Demo

- Save Files
  - Text file (code.txt)
    - Includes prompts and output
    - More of a record of actions
  - Python file (code.py)
    - Only python code is included
    - Reusable script
- Load File
  - Run and view output
  - Notice on output of `print` statement is displayed
- Return value vs print
  - Return value is what is returned from a statement
    - For example `arcpy.GetInstallInfo()` returns a dictionary
    - We assigned that return value to `data`
    - In the console, the return value is shown after a statement is run
    - When the statement is run as part of a script, the return value is not shown
  - The `print` is used to display values to the screen in a script

Help

- Google
- docs.python.org
- Start Menu > All Programs > ArcGis > Python 2.7 > Python Manuals

Data Types

- Number
  - Integer 1, 2, 3, 4
  - Float 1.2321, 0.8474, 10.0
- Sequence
  - String (sequence of characters)
  - List [1, 2, 3] *mutable*
  - Tuple (1, 2, 3) *immutable*
  - Dictionary
    - Key Value Pairs
    - `{'key': 'value', 'key': 'value'}`
    - The return value from `arcpy.GetInstallInfo()`

Numbers

Start with a demo

Integers

- Anything without a decimal
- Don't worry about integer vs long integer in Python

Float

- Floating point number (double)
- Precision varies based on size of number
- Conversion
    - `int(17.9)`, `int(round(17.9))`
    - `float(17)`

Sequences

List

Tuple

Strings

- String are a sequence of characters
  - Common sequence fuctions will work with strings
- Quotation Concepts and New Line Concepts
  - Can be specified using single or double quotes
  - Escape sequences
  - Defining a raw string (r"blah blah blah")
  - Defining a new line
- Demo

Dictionaries