Python for ArcGIS - Writing Scripts to Manipulate GIS Data

Course Length: 3 days
ArcGIS Version: 10.x
App: ArcMap, PythonWIN

Overview

Python is becoming more and more popular for writing custom scripts in ArcGIS. Python scripts can be used to manipulate a map, execute geoprocessing commands, and read/write files. This three-day course takes a leveled approach to writing scripts; beginning with basic Python syntax and simple scripts, ending with scripts that read files, manipulate the information, and create GIS data.

Audience

This course is for those who are already comfortable with the basics of ArcGIS and want to learn how to write Python scripts to manipulate data and maps.

Topics Covered

Day 1

- Introduction to Python – Learn about the Python scripting language, why it is useful, and begin with the basic building blocks of a script. (What is Python?; Writing Python Scripts; Python Syntax)
- Variables – Getting input from the user, storing that information in containers, and converting between different data types. (Variable Declarations; Strings and Numbers; Help and Resources)
- Object Oriented Scripting – Writing scripts that look at data and make decisions based on the properties it discovers. (Objects, Properties, and Methods; Decision Making)
- Modules and ArcPy – Accessing general, and ArcGIS-specific, functionality in Python. (Modules; ArcPy Site Package; ArcPy Methods; arcpy.env)

Day 2

- Geoprocessing with Python – Accessing ArcGIS geoprocessing tools, licenses, and extensions in Python. (ArcToolbox; Calling Tools in Python; Licenses and Extensions; Error Handling)
- Lists and Loops – Reading through lists of information, such as all of the layers in a map document or all of the feature classes in a geodatabase. (Lists; Loops; List Methods)

- Map Documents – Manipulating the contents, layer properties, and other aspects of a map document with Python. (The Big 3 Objects; Table of Contents; Data Driven Pages)
- Data Access with Cursors – Accessing, modifying, or updating the data within a table using Python. (Tuples; Search Cursors; Update Cursors; Insert Cursors)

<u>Day 3</u>

- Working with Geometry – Understanding how shapes are stored for GIS data and how that information is handled in Python. (Understanding Geometry; Python Objects for Geometry; Accessing Geometry)
- Custom Tools – Advanced Python techniques in the Field Calculator and creating custom ArcToolbox tools from Python scripts. (Custom Function Definitions; Script Arguments; Script Tools; ModelBuilder)
- File Input and Output – Work with directories and paths to read and write files, such as creating log files. (Working with Directories and Paths; Reading and Writing Files; File Tips and Tricks)

Format

In-person instruction with hands-on practice and course materials you can keep.

Prerequisites and Recommendations

Attendees should have knowledge of Microsoft Windows® and be familiar with the basic use of ArcGIS, including the topics covered in both the **Fundamentals of ArcGIS** and **Intermediate GIS Concepts** classes.