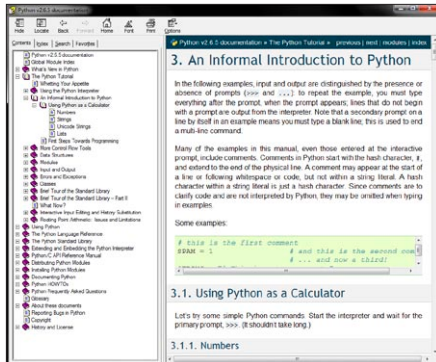
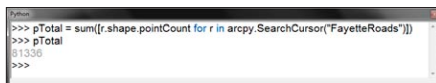


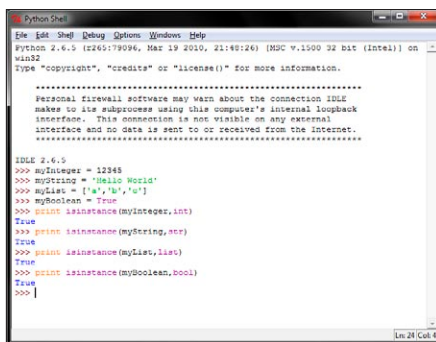
Getting Started with Python in ArcGIS® 10



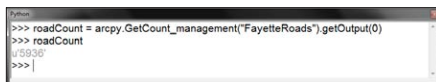
1. Python Introduction Help Screen



2. Python Window Statement



3. Implicitly Typed Python Variables



4. Calling a Geoprocessing Tool as a Python Function

1. Making Your Life Easier with Scripting

Scripts are used to automate time-consuming or complex workflows. Python® is the native scripting language for ArcGIS® 10. You don't have to be a programmer to write Python scripts; you can start by learning the basic Python syntax and its built-in types. Once you know the basics, you can write Python scripts to automate geoprocessing, map production, and data management tasks in ArcGIS. There are many online resources and books in print that teach Python to those with varying levels of programming experience—from complete novices to advanced programmers building sophisticated applications.

2. What Should You Know about Python?

Python is free, cross platform, open source, stable, mature, simple, and powerful. Python has editions (ArcGIS 10 ships with Python 2.6.5), but the changes between editions are well documented.

3. Where Can You Use Python in ArcGIS?

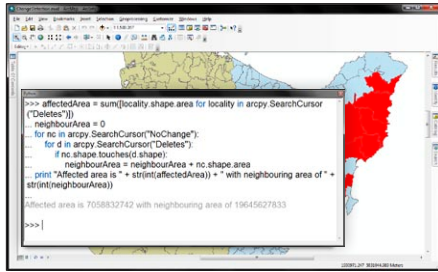
Python is pervasive in ArcGIS 10. It replaces Visual Basic® for Applications (VBA) in the field calculator (although you may continue to use VBScript). The Python window replaces the Command Line window. All geoprocessing tools are available as Python functions. You can even copy Geoprocessing Results window entries and reuse the code in Python scripts. Python scripts can access and update map documents and automate map printing and exporting. You can write Python scripts to use as custom geoprocessing tools inside ArcGIS or as stand-alone scripts that call ArcGIS outside any ArcGIS application.

4. Geoprocessing with Python

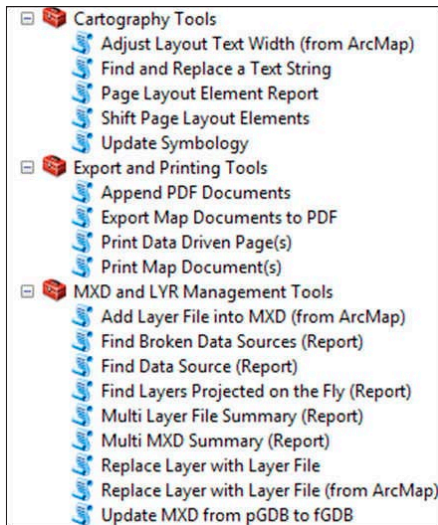
Esri has created the ArcPy™ module for Python, which ships with ArcGIS 10 and includes functions for all geoprocessing tools. The function names use the ArcGIS toolset and tool name (e.g., CreateFeatureClass_management). ArcPy honors the ArcGIS licensing system, so tool access is identical in desktop applications and Python. ArcPy provides access to geoprocessing environment settings. Custom user script tools may be loaded into the ArcPy geoprocessing environment and accessed and run just like the system tools that are installed with ArcGIS.

5. Python and ArcPy Geometry Objects

Field calculation and geoprocessing tools can operate on feature geometry at the row level or with stand-alone geometry objects created within scripts. Geoprocessing tools may accept ArcPy geometry objects as arguments in place of feature layers, in which case they return lists of geometry objects. Geometry objects have a full complement of functions for testing spatial relationships and returning spatial properties.



5. Example of Using Geometry Objects



6. ArcPy Mapping Tools Available on the Resource Center

6. Map Documents and ArcPy

Using the new ArcPy Mapping module, you can access map documents in Python scripts. You can write scripts to print MXD documents, export them to image and PDF formats, and update their layer data sources when needed. You can manipulate labels, legends, text elements, and other layout components. You can even create PDF documents, append pages to existing PDF documents, and insert pages. Scripts can call the operating system to open or print MXD, image, and PDF files.

7. Python and Multiprocessing

ArcGIS 10 supports background geoprocessing, which may make use of another CPU core if the operating system allows it. System and custom script tools may be run as background geoprocessing tasks. Python includes the subprocess and multiprocessing modules that advanced users may leverage to run scripts or functions, respectively, among available CPU cores.

8. Creating Error-Defensive Automated Workflows

ArcGIS 10 ships with the IDLE and PythonWin development environments. To help you efficiently create error-free scripts, both IDLE and PythonWin include syntax checking and code autocomplete once the ArcPy module has been imported into their interactive windows. It is good practice to include error-handling code in Python scripts and validate scripts before executing them.

9. Join the Python Community

Esri publishes a wealth of material on using Python in ArcGIS. Visit the arcgis.com Geoprocessing Resource Center to view model and script tool galleries and share your own Python script tools. You can find and download many Python extension modules on the Web, including **shapely** and **geojson**, which are useful for ArcGIS interoperability.

10. Where to Go for More Python Support for ArcGIS

Learn More about Python

www.esri.com/python

Learn More about ArcPy

www.esri.com/arcpy

Geoprocessing Blog

<http://blogs.esri.com/Dev/blogs/geoprocessing/default.aspx>

Learn More about Geoprocessing

<http://resources.arcgis.com/content/geoprocessing/10.0/about>

Geoprocessing Model and Script Tool Gallery

<http://resources.arcgis.com/gallery/file/geoprocessing>

Esri Training

Introduction to Geoprocessing Scripts Using Python—Instructor-Led Course

Using Python in ArcGIS Desktop 10—Free Online Training Seminar

www.esri.com/training

Submit, discuss, and vote on ideas for Python on the ArcGIS Ideas Web site.

<http://ideas.arcgis.com/>



www.esri.com/arcgis10