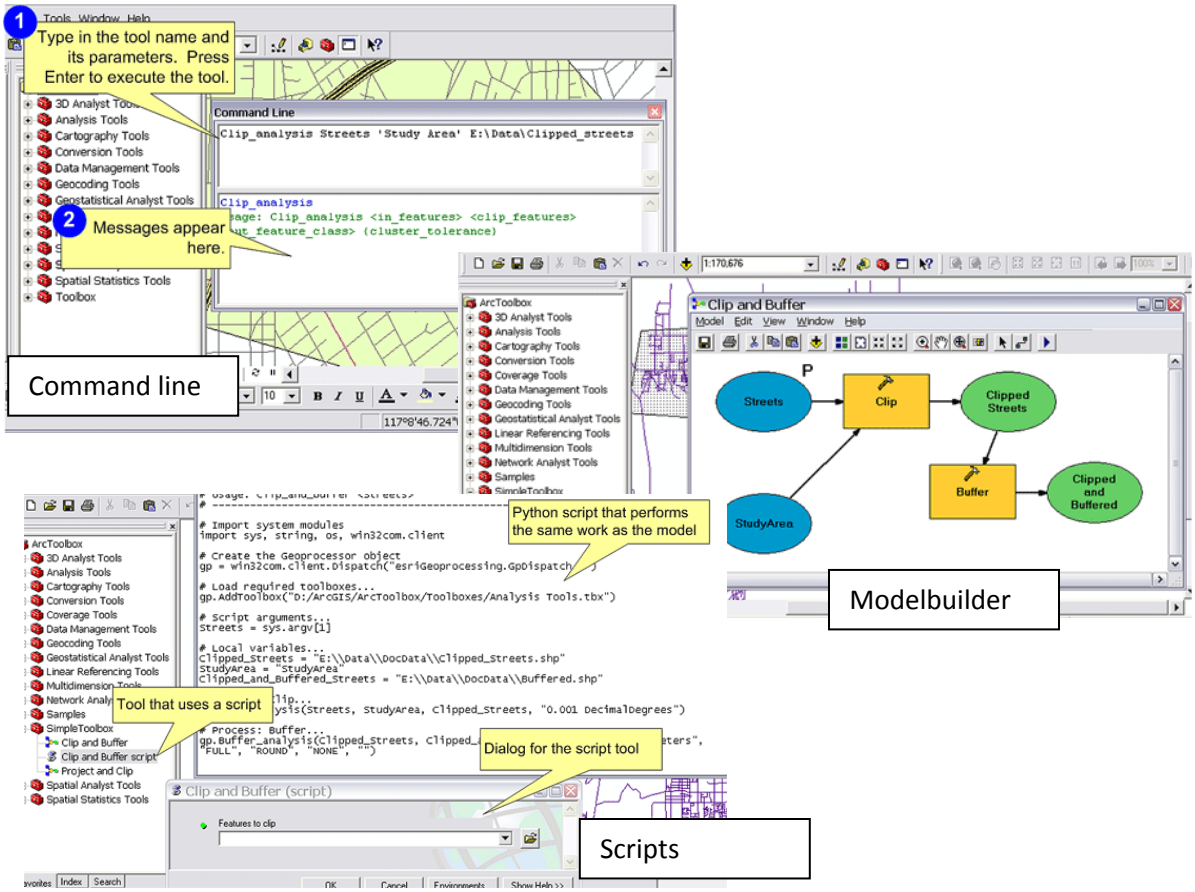
Chapter 3: Getting acquainted with ArcGIS

3.0 ArcGIS Geoprocessing Framework

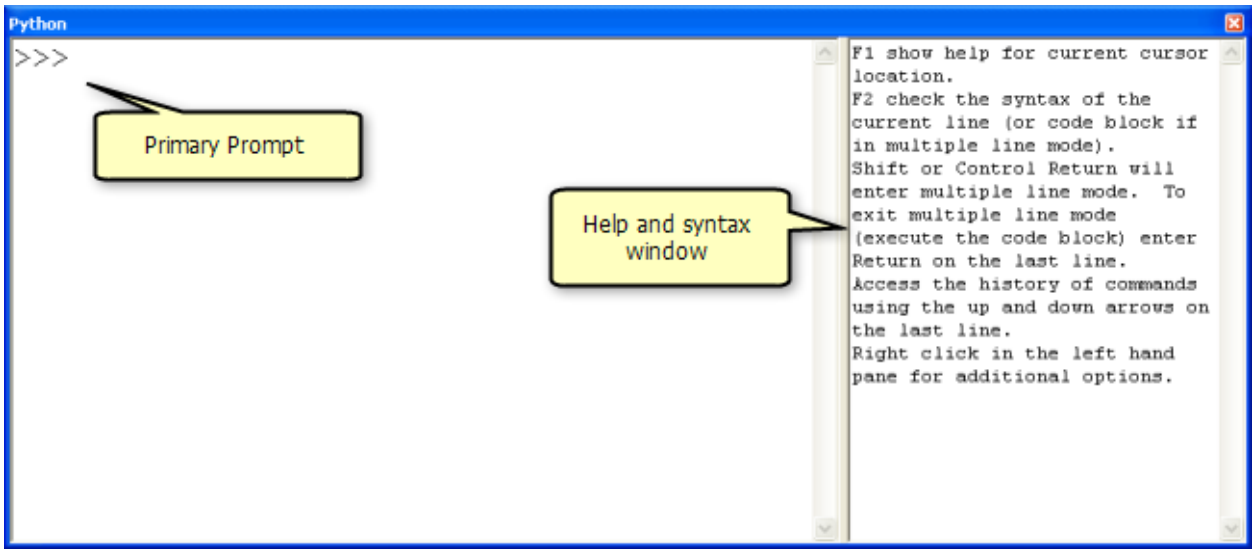
- The geoprocessing framework is the set of windows and dialog boxes you use to manage and execute tools.
- The core idea behind geoprocessing is to allow you to quickly and easily turn your ideas into new software that can be executed, managed, modified, documented, and shared with the ArcGIS user community. Software, in this case, means something that instructs ArcGIS to do what you want.
- In order to create new software of any kind, two essential elements are needed:
    - A formal *language* that operates on the data captured within the system.
    - A *framework* for creating, managing, and executing software based on this language. This includes things such as editors, browsers, and documentation tools.
- Geoprocessing's language is its collection of tools. The geoprocessing framework is a small collection of built-in user interfaces for organizing and managing existing tools and creating new tools. The basic components of the framework consist of:
    - The ArcToolbox window for navigating the collection of geoprocessing tools and opening them for execution.
    - The tool dialog box for interactively filling out tool parameters and executing the tool.
    - The Command Line window for typing in a tool name followed by its parameters and executing the tool.
    - The ModelBuilder window for chaining together sequences of tools.
    - Methods for creating scripts and adding them to the ArcToolbox.
- More information on the Geoprocessing framework can be found at http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=Geoprocessing_framework
- Geoprocessing tasks are usually time consuming and repetitive involving many layers and many operations.
- These tasks often need to be run on a periodic basis.
- Scripts can be used to automate tasks and schedule them to run then they need to be to fit many different operational settings.

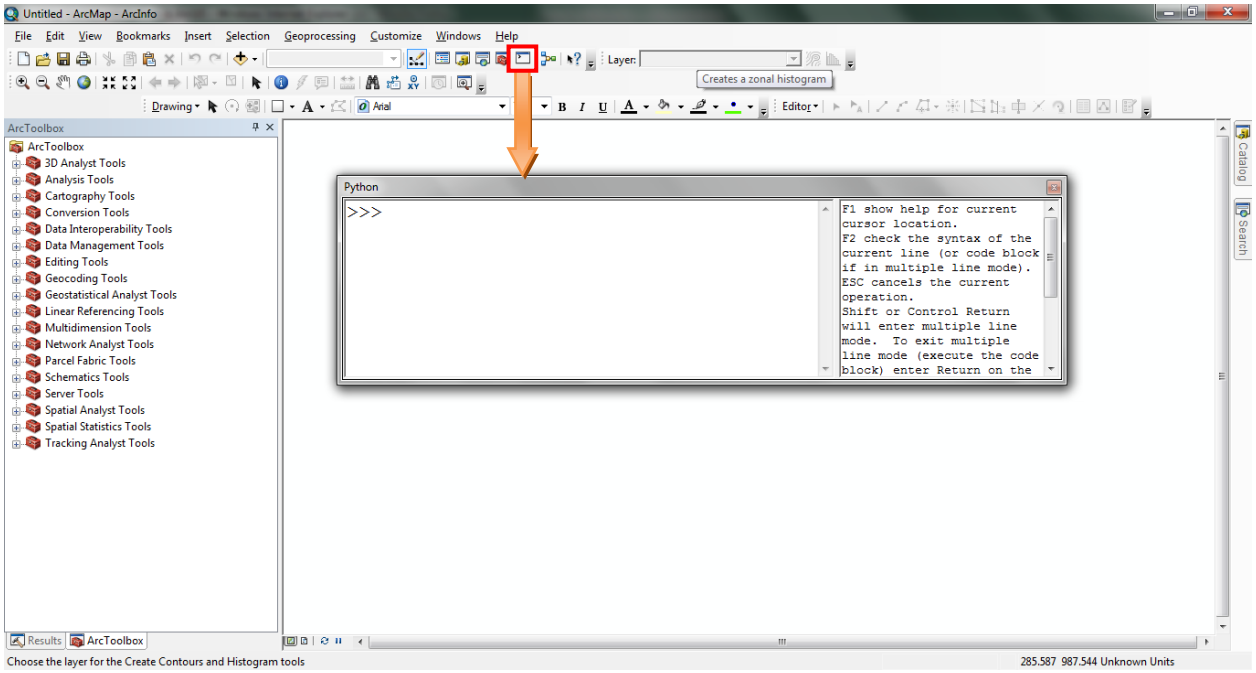


- ArcObjects API is at the core each of these tools supporting execution at a low level.

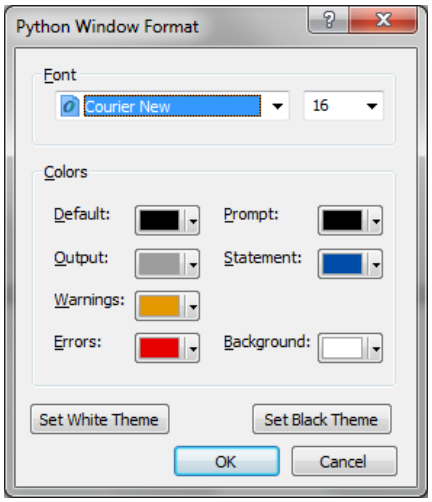
3.1 ArcGIS 10 and Python

- Fully supported
- ArcGIS 10 comes bundled with ArcPy giving Python access to all geoprocessing tools and functions.
- ArcPy is a site-package that builds on (and is a successor to) the successful arcgisscripting module. Its goal is to create the cornerstone for a useful and productive way to perform geographic data analysis, data conversion, data management, and map automation with Python.
- The geoprocessor module represents the gateway to all geoprocessing functionality in ArcGIS. The module must first be imported in previous versions of ArcGIS for Python to be able to access GP functionality. The arcgisscripting module was used to accomplish this.
- The new Python window in ArcGIS 10 can be used to write and test short blocks of Python code. It is ideal for testing code before moving to a script tool or a standalone script. Additionally, it can be used to build quick and easy workflows in Python





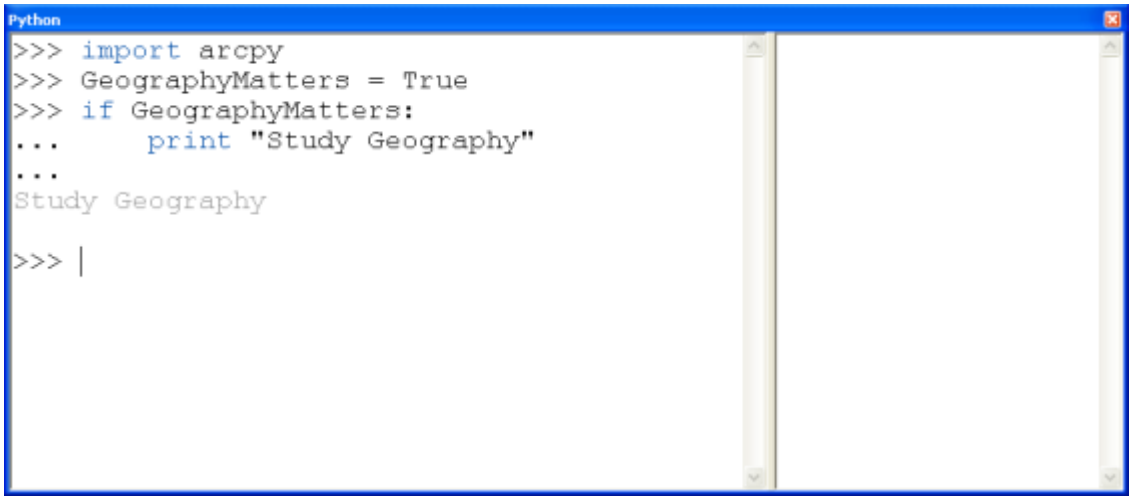
- The Python window has various color coded customization options. (Right click on window →Format). The window can also be pinned or docked.



- Python CANNOT be used to customize the ArcGIS Desktop interface
- Python is one of many languages that supports COM allowing it to interface with ArcObjects.

3.2 Over view of Python Window

- Once opened, the Python window can be moved by clicking the bar at the top and dragging to your preferred location. The window can be docked or undocked.
- The window prompts for the next command with the primary prompt, three greater-than signs (>>>), and continuation lines prompt with the secondary prompt, three dots (...).
- Continuation lines are needed when entering a multiline construct. See the following example using an if statement:



The Python window contains two sections:

- The Python section on the left. This is where commands are entered.
- The Help section on the right. This is where command usage, help, and execution messages are viewed. This section can be hidden or placed to the right, left, top, or bottom of the Python section.

3.3 Exercise2