NR 426 – Programming for GIS I
Lab 6 – Creating Script Tools

Warner College of Natural Resources | Colorado State University | Instructor: Elizabeth Tulanowski

Learning objectives:

1. Add user arguments to make scripts dynamic
2. Create script tools in ArcToolbox out of your own Python code

What to submit:

From the demo and self-directed activity: Submit the modified .py script and screenshots of your tool's dialog box -AND- the tool properties window showing how each parameter is set up, to Canvas.

In class hands-on activity:

- Examine two script tools that come with ArcGIS Pro: Multiple Ring Buffer and Average Nearest Neighbor
- As a follow-along demo with the RandomSample.py script (from the Advanced Python Scripting for ArcGIS Pro book, Ch. 3):
    - Examine the original script, determine what we want in the script tool
    - Modify the code to accept user arguments (GetParameterAsText)
    - Create the script tool in ArcGIS Pro
- Examine the InsertWildfires.py to see how a table of XY coordinates can be turned into points with an Insert Cursor

Self-directed activities:

Continue with the Random Sample.py code from the demo. Perform the following tasks:

- Modify the header code to indicate that you are changing someone else's code
- Add any additional comments or print/AddMessage statements to go along with your modifications, and make the code better overall.
- Add the logic to compare the number of features *to select*, to the number of features *in the dataset*.
    - If the user chooses more features than the input layer has, return a message and choose how to make the script proceed (return and error and not run at all? Or just select all features?)

Submit the finished .py script and screenshots of your tool's dialog box -AND- the tool properties window showing how each parameter is set up, to Canvas.

Optional challenge: Throwback using Python in Calculate Field. Unrelated to the above task.

Look at Colo_vert_county.xlsx in the Lesson 5 folder FieldCalculateData folder.

This table contains a listing of every vertebrate species in Colorado and what counties they can be found in (ranked by likelihood)

a. Is this table ready to use in ArcGIS? Clean it up if needed.(Manually, in Excel)
b. Note the species column: it contains both scientific and common name:

Great Basin Spadefoot (Spea intermontana)
New Mexico Spadefoot (Spea multiplicata)
Western Toad (Bufo boreas)
Great Plains Toad (Bufo cognatus)
Green Toad (Bufo debilis)

How can you turn the above column into this, using Python in the Calculate Field tool:

Species	Common
Great Basin Spadefoot	Spea intermontana
New Mexico Spadefoot	Spea multiplicata
Western Toad	Bufo boreas
Great Plains Toad	Bufo cognatus
Green Toad	Bufo debilis

Try this out as a fun challenge, and we'll discuss next week. (And I'll give you the solution!)

Tips: Break it down into several small steps. Attack one issue at a time. Test your methods in the console window in PyCharm using a "dummy"string, ie, x = "New Mexico Spadefoot (Spea multiplicata)" and test all your string manipulations on x.

Email me if you need a hint.

This task could be expanded upon as a final project idea. Turn this spreadsheet (or a subset of it) into an actual map, using a Colorado counties layer (I can help you find one).

Rev. 11/29/25