Geography 378: Introduction to Geocomputing
Lab 7: ArcPy

Assigned: 12/1
Due: 12/14
20 points

Hand-in

- Please collect your answers in separate .py files. Compress and name the zip file **lab7_yourname.zip**.
- Submit the files to the assignment folder called "Lab 7".
- Include appropriate comments to explain what each line or block of code accomplishes. **You must comment your code for full credit.**

Background

Lab 5 & 6 provided experience using GDAL/OGR with Python. Now we turn to the ArcPy library, which provides methods for both raster and vector (feature) processing.

Lab Tasks

1. (10 pts) Assume that electromagnetic fields generated by power lines are health hazard and people don't want to live within 250 feet of a power line. Write a Python program using ArcPy to construct a new shapefile consisting of parcels (from the polygon data*: Parcels.shp*) that are **completely within** a 250-feet buffer of the power line (*PowerLine.shp*). After you generate the shapefile, open ArcGIS or QGIS and display three layers (the Powerline, the 250-feet buffer and the selected Parcels). Make a screen shot or export the map to a PDF file. Turn in the image or PDF file along with your Python script.

   Hint:

   1. You can use example11.5-arcpySelectByLocation.py as a reference.

   2. You can manually create a geodatabase at first to store the two shapefiles, so it might be easier to work with the files. The way to create a geodatabase:

   - open ArcCatalog -> click File, select 'Connect To Folder', navigate to the folder which has the shapefiles and click 'OK'
   - The folder should appear in the 'Catalog Tree' window, right click it, click New -> File Geodatabase, there should be a new gdb under your folder, you can rename it so it has a meaningful name

- right click that Geodatabase, select import 'Featuer Class (multiple)', add the two shapefiles "parcels" and "powerline" to the input features and click 'OK', it may take a few seconds to import the shapefiles, but the two shapefiles should appear under the geodatabase shortly.
- Then in your script, you can set arcpy.env.workspace to be the location of your geodatabase.

2. (10 pts) Using Arcpy, write a Python script to create an RGB composite color-shaded choropleth **slope** map using the input digital elevation model (DEM) raster data: *elevation.tif*. Hint: You can use Lecture 11--example 11.8 as the reference for this task, the main difference is that in example 11.8, the choropleth map was directly created from the DEM layer. You need to think about the changes you need to make. Open your newly created file in ArcGIS or QGIS and make a screen shot or export the map to a PDF file. Turn in the screenshot or PDF file, **the generated tif image** along with your Python script.