

Assignment 7

The provided script (a7.py) contains an initial block of code that will renew the data each time the script is run. This is to make sure you have a fresh copy as you develop/test your scripts. Edit the provided script, a7.py to perform the tasks below. As you complete, and verify each task works, comment out that task. Clearly identify your blocks of code for each task by their letter.

- a) Using a searchcursor, print out the tract id's and the coordinates of the centroid for each census block group where the percentage of the population of Black race exceeds 95% or is below 0.5%.
- b) Adds a text field (8 characters) [think tool] to the block groups feature class and then assign it a value of "High" if the percentage of the population of Black race exceeds 80%, "Low" if the percentage is below 10%, and "Medium" otherwise.
- c) Makes a copy [think tool] of the block groups feature class and then, using the copy, deletes those records where the percentage of Black race is less than 25%.
- d) Makes a copy of the gas stations feature class, and then, using the copy, adds three new features based on the information in the "newgasstations.txt" file – this file should be opened by your script and the data processed there. The script should also change the name of the "Sinclair" stations to "Reader's".
- e) Creates a new empty line feature class [think tool] using the same spatial reference as the gas stations feature class and adds a text field (6 characters) to it. Then, creates a feature for each line that runs from each of the locations in the "newgasstations.txt" file to the location (642800,4876000), and populates the added text field with "path1", "path2", "path3".
- f) Creates a copy of the sarea feature class and then, using this copy, moves the features as follows: feature A is moved 1000 meters west and south, feature B is moved 1000 meters east and south, feature C is moved 1000 meters west and north, and feature D is moved 1000 meters east and north.

- g) The shapefile HgValues (soil sample data) has 6 point locations but 12 rows in the attribute table. Each row represents a sample taken and so some (or all) of the point locations must have multiple samples. Your task is to create a multi-part representation of the soil sample data (i.e. a multi-point shapefile) so that samples at the same location are part of the same multi-part feature, and also to have this new shapefile inform us as to the mean value of the HgValue variable. Note that this exercise does not involve writing feature geometry. It does involve manipulating an attribute field that can then be used by the Dissolve tool to create the new multi-part shapefile. The attribute field you will manipulate so as to give the Dissolve tool something to dissolve on is the UniqueID field.
- h) In this task, you are the GIS consultant to a biological field research team who need to conduct line transect based sampling for a study area. The study area measures 100x100 units, with the lower-left coordinate set at (0,0). Your task is to provide them with feature classes to enable their work:
- Create one line feature class (shapefile) of 20 random straight-line transects for the study area, individually identified (using an attribute field) by the letters A thru T. Each line transect must be between 35 and 55 units in length.
 - Create a polygon feature class (shapefile) that bounds the study area.

Note: When creating the empty feature classes, place them in the working folder but don't use any spatial reference for them (i.e. don't take the spatial reference info from other shapefiles there).