Lab Report

Title: GIS 5572 Lab0
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Project Repository: https://github.com/HaihanW/GIS5572.git
Google Drive Link: None

Abstract

For section 1, the work is in Github.com and dealing with the basic actions in git. For section 2, the work is to compare three basic operations in three different environments. The data are chosen from Minnesota Geospatial Commons. The method is to perform the same operation in different environments and compare the results. Then, the similarity and difference of the three environments would be shown and discussed with the results of every step.

Problem Statement

The Esri ecosystem has many ways that you can access the same underlying functionality. Your objective is to compare performing the same simple activity - buffer a network dataset - using three different tools: ArcPro, Jupyter Notebooks in ArcPro, Jupyter Notebooks in ArcOnline.

Table 1. All data table

#	Requirement	Defined As	(Spatial) Data	Attribute Data	Dataset	Preparation
1	Area around the Publicly Accessible State Wildlife Management Areas	>= 500 meters	Area within certain distance		Minnesota Geospatial Commons	
2	Area around the transit shelters	> 100 meters		Distance	Minnesota Geospatial Commons	
3	Area around the Agricultural Preserves	>= 100 meters	Area within certain distance		Minnesota Geospatial Commons	

Input Data

The three data are all chosen from the website Minnesota Geospatial Commons.

Table 2. Data table

#	Title	Purpose in Analysis	Link to Source

1	Publicly Accessible State Wildlife Management Areas	Set the area of the Publicly Accessible State Wildlife Management Areas to 500 meters larger on each side.	https://gisdata.mn.gov/data set/bdry-dnr-wildlife-mgmt-areas-pub
2	Transit Shelters	Select the areas within 100 meters around each transit Shelters.	https://gisdata.mn.gov/data set/us-mn-state-metc-trans-bus-shelters
3	Agricultural Preserves 2019	Set the area of the Agricultural Preserves to 100 meters larger on each side.	https://gisdata.mn.gov/data set/us-mn-state-metc-agri-agricultural-preserves2019

Methods

ArcPro:

First, opening the ArcPro and add all the data to the maps. Second, processing the data as the following flow diagram.
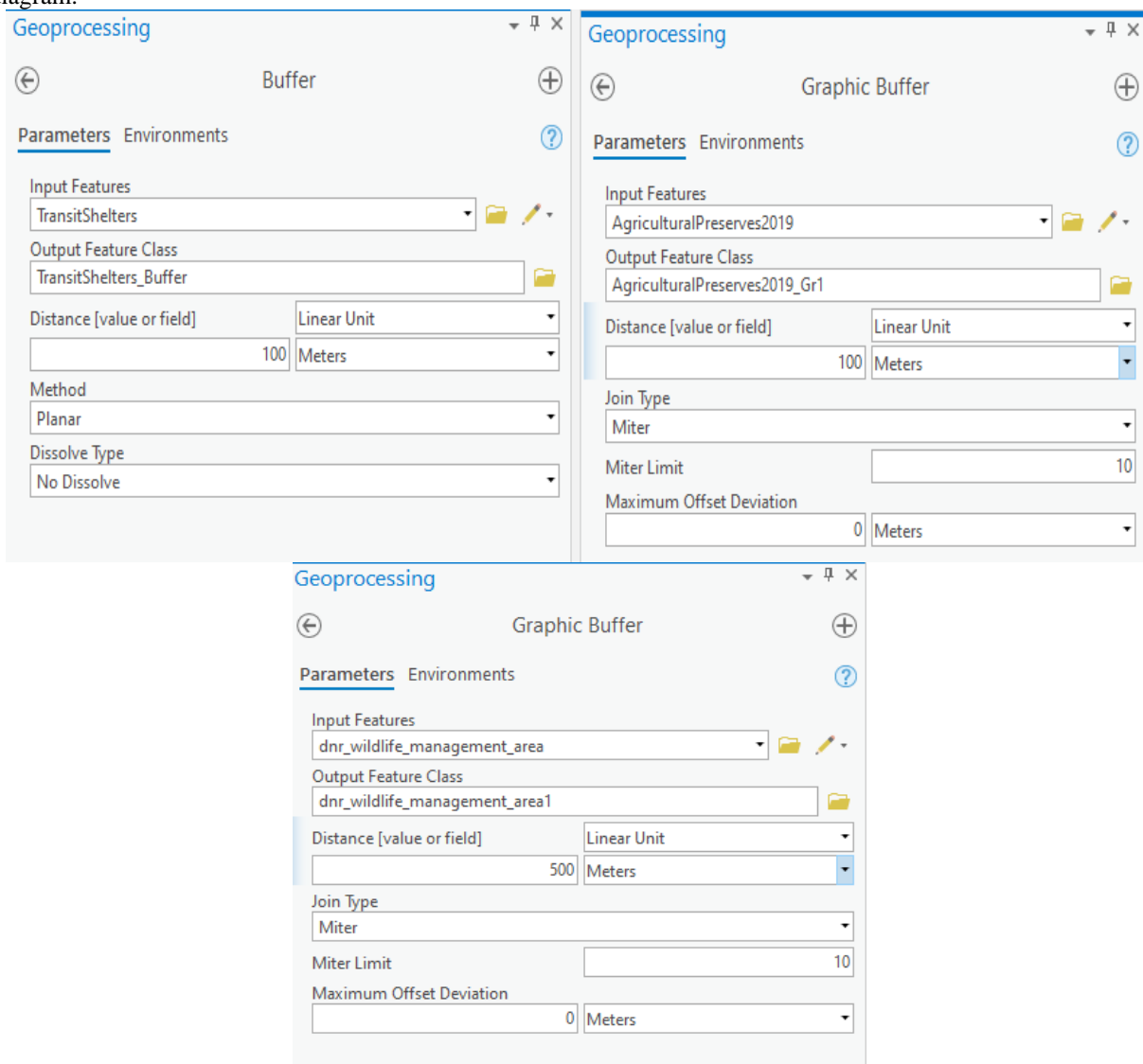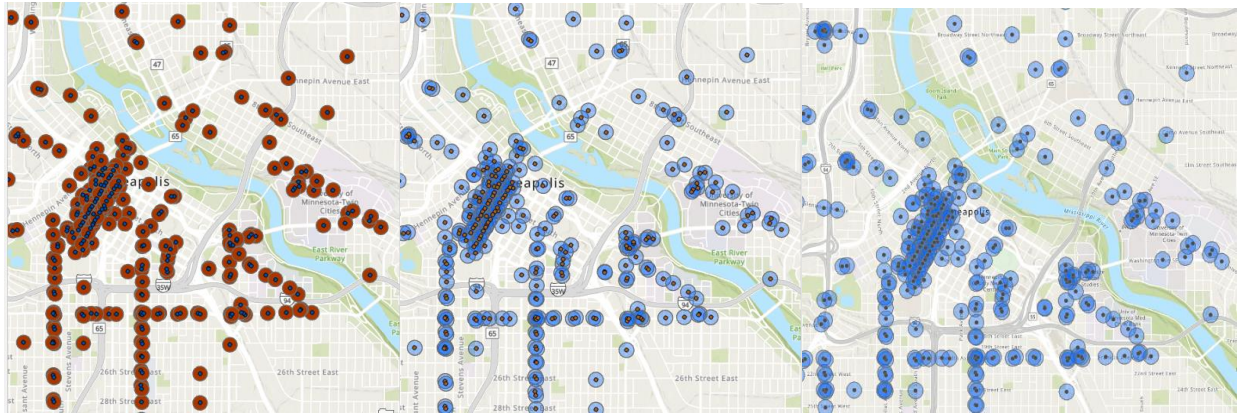
Jupyter Notebooks in ArcPro:
First, adding a new notebook. Second, import arcpy module to set up. Third, adding the codes to process the input data as needed.

Jupyter Notebooks in ArcOnline:
First, adding a new notebook. Second, import gis module to set up and add the data to the environment. Third, adding the codes to process the input data as needed.

Results

Map created by ArcPro   Map created by Notebook in ArcPro   Map created by Notebook in ArcOnline

The result shows that there are no different for the maps created in the three different ways besides the default color setting. The result presents that the maps are all the same and the three methods provide the same thing.

Results Verification
We can use the calculation tools to get the value of each point or area in the three features and measure the data one by one to see if it fits the conditions. This can be a quantitative verification.

Discussion and Conclusion
Section 1: GitHub
In this section, everything went well as I have previously used GitHub in another class. The only thing that was tricky is setting up the folder.

Section 2: ArcPro, Jupyter Notebooks, and ArcOnline
This part was hard as I must make sure I used the correct code to set up the environment and run the tools. It is easier to use the AcrPro tools than using python codes. However, it is more efficient to write python code to process the data once I understand the how the tools run and code to be written.

References
Notebooks in ArcGIS Pro, https://pro.arcgis.com/en/pro-app/latest/arcpy/get-started/pro-notebooks.htm
Get started with notebooks, https://doc.arcgis.com/en/arcgis-online/get-started/components-of-the-notebook-editor.htm

Self-score

Category	Description	Points Possible	Score
Structural Elements	All elements of a lab report are included (**2 points each**): Title, Notice: Dr. Bryan Runck, Author, Project Repository, Date, Abstract, Problem Statement, Input Data w/ tables, Methods w/ Data, Flow Diagrams, Results, Results Verification, Discussion and Conclusion, References in common format, Self-score	28	**28**
Clarity of Content	Each element above is executed at a professional level so that someone can understand the goal, data, methods, results, and their validity and implications in a 5 minute reading at a cursory-level, and in a 30 minute meeting at a deep level (**12 points**). There is a clear connection from data to results to discussion and conclusion (**12 points**).	24	**24**
Reproducibility	Results are completely reproducible by someone with basic GIS training. There is no ambiguity in data flow or rationale for data operations. Every step is documented and justified.	28	**28**
Verification	Results are correct in that they have been verified in comparison to some standard. The standard is clearly stated (**10 points**), the method of comparison is clearly stated (**5 points**), and the result of verification is clearly stated (**5 points**).	20	**20**
		100	**100**