

Hope Supply Co. Partner Geocoding Project Portfolio Write-Up

By Crystal Hollis, GISC 2335 – Programming for GIS

GitHub:

https://github.com/crystaljhollis/DallasCollege_Portfolio/tree/main/GISC2335_ProgrammingForGIS/WeeklyContent/week16

Package Link: <https://arcg.is/0aq4OT2>

Problem Statement

Hope Supply Co. provided me with a list of 2024 partner agencies-- Pantry Partners, Diaper Bank Partners, and Outreach Partners-- but no street addresses or coordinates. Manually looking up each location in ArcGIS Pro would be tedious and error-prone. My goal was to fully automate the geocoding process so that every partner agency appears as a point on a map, complete with address fields and X/Y coordinates. I combined elements from my prior Python automation coursework within the Dallas College Python Developer Certificate program as well as Geoprocessing techniques from GIS Programming class. The result is a portfolio project that serves as a Capstone project in my final semester.

Files and Datasets

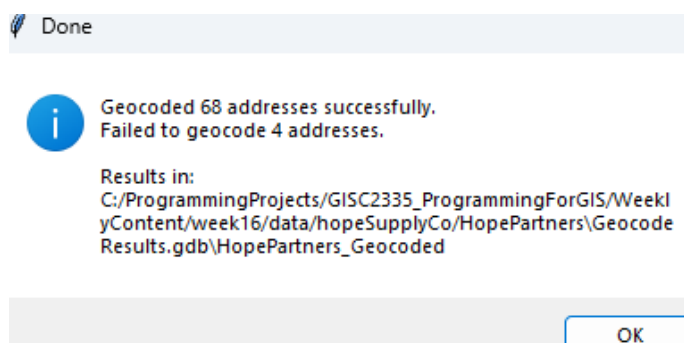
- Python Scripts: *hopeSupplyGeocodingPartners.py* and *hopeSupplyGeocodingMulti.py*
 - Batch File: *EditAndRunIfPrompted_GeocodeLauncher.bat*
 - Spreadsheet: *HopePartners1.xlsx*
 - ArcGIS Pro Project: *HopePartners.aprx*
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What the Scripts Do

- 1. Environment & License Validation**
 - Each Python script first confirms it's running under the ArcGIS Pro "arcgispro-py3" interpreter and that an ArcInfo (Advanced) license is available, exiting cleanly with a pop-up error if requirements aren't met.
- 2. Workspace & Excel Workbook Selection**
 - The user is prompted to choose an output folder and the Excel workbook containing partner data. If the workbook contains multiple sheets, the user is asked to select or type the correct one.
 - Using Tkinter allowed me to make the script more user-friendly and interactive. In the future, I plan to explore additional GUI features-- such as progress bars or wizard-style prompts-- to further streamline the experience for non-technical users.
- 3. Data Ingestion**
 - I use pandas to read that HopePartners1.xlsx into a DataFrame; then convert it into a structured NumPy array sized exactly to each column's longest string-- this avoids ArcPy's Excel-to-table quirks. The array loads into an in_memory table.

4. Geocoding

- **Single-location script:** calls ArcPy's GeocodeAddresses tool once on the entire table. The script is complete when the pop-up appears:



- **Multi-location script:** Still a work in progress, intended to handle partners that have multiple addresses. “Unpivots” any number of address columns into one “SingleLine” field, then either calls GeocodeAddresses or hits the ArcGIS World Geocoder REST API per row and uses an InsertCursor to append each result.

5. Post-Processing

- Adds X/Y, ensures all address fields (PartnerAddress, City, State, County, ZIP) exist, and exports any matches scoring below 80% for manual review.

6. Final Output

- The multi-location version appends new location points into a single “final” feature class (HopePartners_Final), preserving the original single-location results.

About the Batch Launcher

I supplied a simple .bat file—**EditAndRunIfPrompted_GeocodeLauncher.bat**—that novices can edit in Notepad to point PYTHON_EXE at their ArcGIS Pro Python interpreter. Double-clicking the batch file then ensures the script always runs in the correct environment, catches exit codes, and prints friendly success or error messages to the console.

```

C:\WINDOWS\system32\cmd. X + v
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This helper will run the geocoding script using
ArcGIS Pro's Python environment.

STEPS TO CONFIGURE:
1) Locate your ArcGIS Pro install folder, e.g.:
   C:\Program Files\ArcGIS\Pro
2) Open the subfolder: \Python\envs\arcgispro-py3\
3) Copy the full path to python.exe in that folder.
4) In the next screen, paste that path into this file.

Press any key to continue . . .

Which geocoding script do you want to run?
  1 - Single-location (hopeSupplyGeocodingPartners.py)
  2 - Multi-location (hopeSupplyGeocodingMulti.py)

Enter 1 or 2, then press ENTER: 1

Running: C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week16\data\PythonScripts\hopeSupplyGeocodingPa
tners.py
Using Python: PASTE_FULL_PATH_TO_arcgispro-py3\python.exe

The system cannot find the path specified.

[ERROR] The script did not complete successfully.
Check the messages above, fix any issues, and try again.

Press any key to continue

```

Key Lessons Learned

- **Iteration Is Essential:** Each time I tweaked the code-- fixing sheet-path syntax, adjusting field mappings, handling empty strings-- I got closer to a solution.
 - **Raw Strings Aren't Foolproof:** Simply prepending `r"..."` sometimes didn't normalize slashes on Windows, so I used `os.path.normpath()` to guarantee valid backslashes for ArcPy.
 - **Pandas + NumPy Ingestion:** Bypassing ArcPy's Excel tools with `pandas.read_excel` and `NumPyArrayToTable` finally resolved my problem after hours of "Table Load Error" headaches.
 - **Living Atlas & Beyond:** I discovered powerful Living Atlas layers (e.g., under-6 poverty, demographic rasters) and ArcGIS Online that I can add to my maps.
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Next Steps

1. **Finalize Geocoding Scripts:** I will continue developing the script until it is functional and reusable. I will develop a version that I can reuse for other similar problems.
 2. **Thematic Mapping:** Pull in a Living Atlas layer such as "Children Under 6 Living in Poverty" for Dallas–Fort Worth and symbolize partner points against it to identify service gaps.
 3. **Deliver a Report:** Volunteer to present findings to Hope Supply Co., demonstrating where new diaper or hygiene kit distributions are most needed.
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Conclusion

I'm still sharpening my skills, but this automated pipeline lays a solid foundation for data-driven decision-making for Hope Supply Co.'s nonprofit outreach. By transforming a basic partner list into mapped, geocoded data, I've taken the first step toward helping Hope Supply Co. visualize where their services are reaching and where potential gaps exist. As I continue learning, I plan to integrate additional spatial data from ArcGIS Living Atlas (such as child poverty rates or underserved zip codes), refine my interface for non-technical users, and generate customized reports that can support grant applications, volunteer planning, and targeted resource delivery. This project has shown me how powerful GIS scripting can be in the hands of community-driven organizations, and I'm excited to keep building tools that make that impact even stronger.

APPENDIX

Laura Montalvo

Program Director

Hope Supply Co.

laura@hopesupplyco.org

Subject: Crystal Hollis - GIS Project for Hope Supply Co. (School Portfolio) Questions

Hi Laura,

Thank you again for being open to me working on a school project that supports Hope Supply Co.!

Since my deadline is coming up quickly (the project is due May 11), I'm planning to create a geospatial analysis and report. The project will demonstrate applied GIS analysis techniques, such as mapping patterns of need, finding efficient delivery routes, and identifying areas that may need additional support, using newly sourced public or approved datasets. The final product could potentially assist with planning, grant writing, or outreach efforts.

If available, would you be able to help me answer a few quick questions so I can best align the project with your team's needs?

What do you think should be the focus?

- Mapping areas of greatest need (such as child poverty rates or service gaps)
- Optimizing basic delivery routes for supplies
- Another area you think would be most useful to your team

Additional Context (if applicable):

- Who would be the intended audience for this project? (e.g., internal leadership, donors, partners)
- What decisions or actions might the project inform? (e.g., fundraising strategy, delivery logistics, partnership outreach)

If internal information is available:

To assist the project, if any basic internal data is available and appropriate for public use, formats such as a CSV spreadsheet, Excel file (XLSX), or shapefile (SHP) would be ideal — for example, a list of partner locations, service sites, or delivery points.

Otherwise, I will proceed using public datasets, including:

- U.S. Census Bureau data (child poverty rates, household income, households with children)
- City of Dallas Open Data Portal (schools, clinics, food pantries, shelters)
- USDA Food Access Research Atlas (identifying food deserts and low-access areas)

Important Note:

Because this project is for a graded assignment and will also be shared publicly as part of my professional online portfolio, any internal information shared would need to be appropriate and approved for public distribution. Otherwise, I will strictly rely on public datasets.

Thank you again for your time and support! I appreciate it, and I hope the final project can be of real value to Hope Supply Co.

Best regards,

Crystal Hollis

Student

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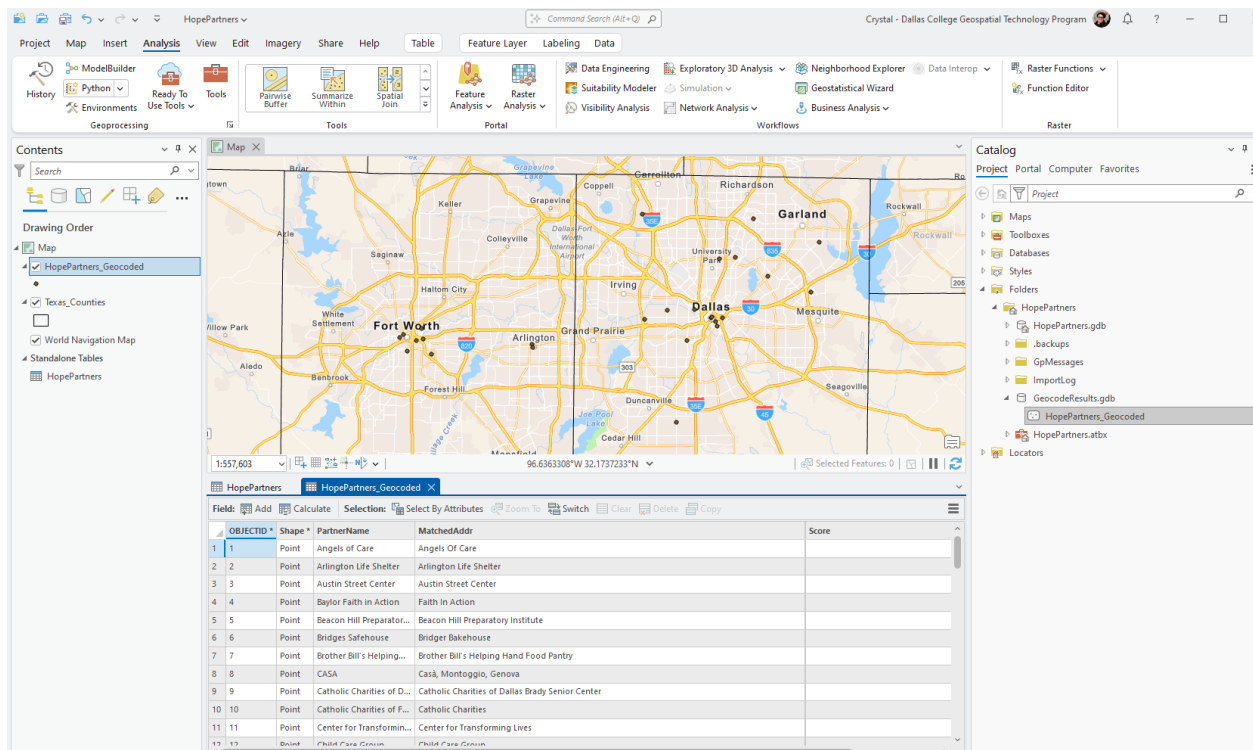


Figure 1 Results of hopeSupplyGeocodingPartners.py script