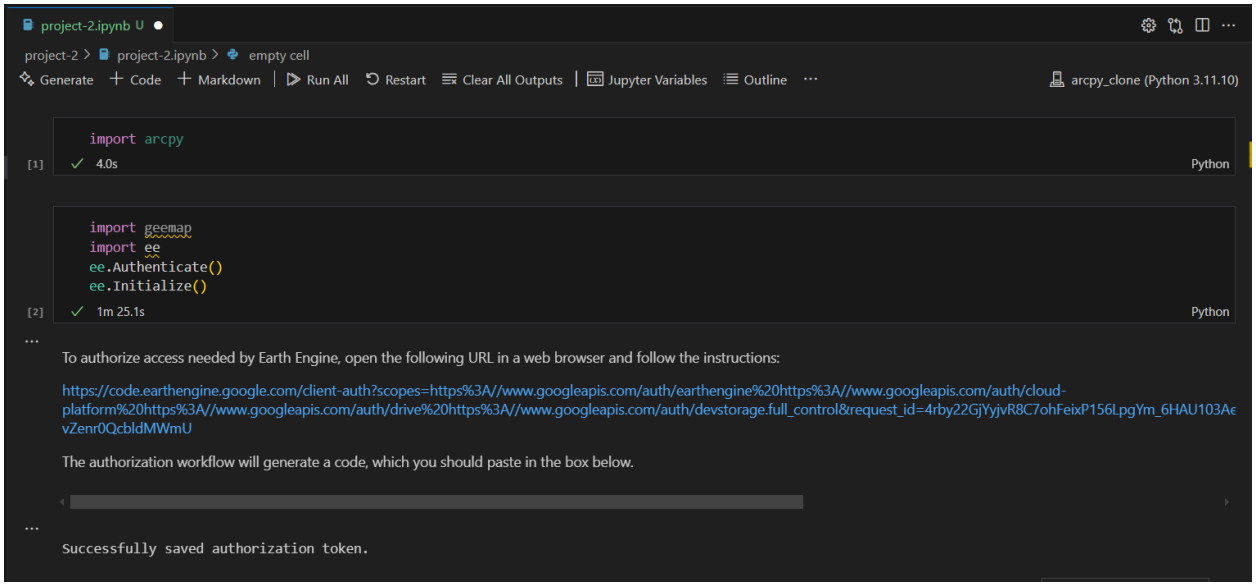
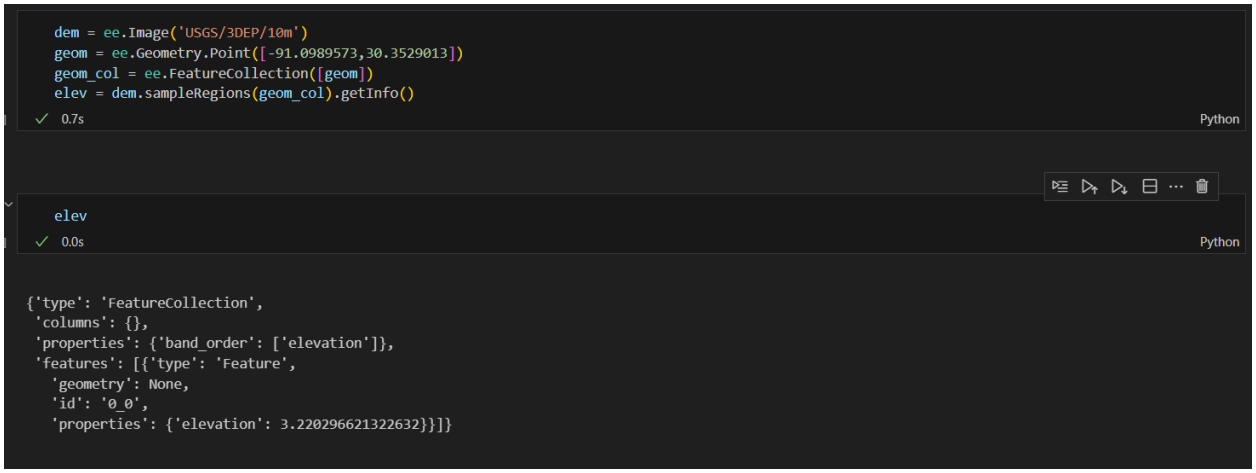
Working with GEE

1. Ensure all libraries are installed in the correct environment



2. Explore raster data in gee



3. Open the provided csv and the raster file, convert the csv file to a spatial dataframe with spatial reference as that of the raster

```
import pandas as pd
table = pd.read_csv("D:\\LSU\\Sp_2025\\GEOG4057\\ishmam-GEOG4057-final-project\\project-2\\data\\boundary.csv")
```

[9] ✓ 0.0s Python

```
ra1 = arcpy.Raster("D:\\LSU\\Sp_2025\\GEOG4057\\ishmam-GEOG4057-final-project\\project-2\\data\\flood_2class.tif")
import geopandas
gdf = geopandas.GeoDataFrame(table)
gdf.set_geometry( geopandas.points_from_xy(gdf['X'], gdf['Y']), inplace=True, crs=f'EPSG:{ra1.spatialReference.factoryCode}')
```

[10] ✓ 1.0s Python

```
gdf
```

[12] ✓ 0.0s Python

	col	row	X	Y	geometry
0	4871	174	699102.887792	186780.445813	POINT (699102.888 186780.446)
1	4871	174	699102.887792	186780.445813	POINT (699102.888 186780.446)
2	4872	174	699105.887419	186780.445813	POINT (699105.887 186780.446)
3	4870	175	699099.888166	186777.446186	POINT (699099.888 186777.446)
4	4873	174	699108.887046	186780.445813	POINT (699108.887 186780.446)
...	...	...	...	...	...
333	4825	232	698964.904966	186606.467466	POINT (698964.905 186606.467)
334	4826	234	698967.904593	186600.468213	POINT (698967.905 186600.468)
335	4825	233	698964.904966	186603.467840	POINT (698964.905 186603.468)
336	4825	234	698964.904966	186600.468213	POINT (698964.905 186600.468)
337	4825	234	698964.904966	186600.468213	POINT (698964.905 186600.468)

338 rows × 5 columns

4. Extracting the elevation values from the dem to the points shapefile by adding another attribute called “elevation” [full code has been provided in the github repository as project-2.ipynb]

```
import os
arcpy.env.workspace = "D:\\LSU\\Sp_2025\\GEOG4057\\ishmam-GEOG4057-final-project\\project-2\\data"

fcname=os.path.join(arcpy.env.workspace,'pnt_elev.shp')
if arcpy.Exists(fcname):
    arcpy.management.Delete(fcname)
arcpy.management.CreateFeatureclass(arcpy.env.workspace,'pnt_elev.shp',geometry_type='POINT',spatial_reference=32119)
```

[17] ✓ 2.3s Python

Messages

Start Time: Thursday, May 8, 2025 2:24:47 AM
Succeeded at Thursday, May 8, 2025 2:24:47 AM (Elapsed Time: 0.12 seconds)

```
arcpy.management.AddField(fcname, field_name='elevation', field_type='FLOAT')
```

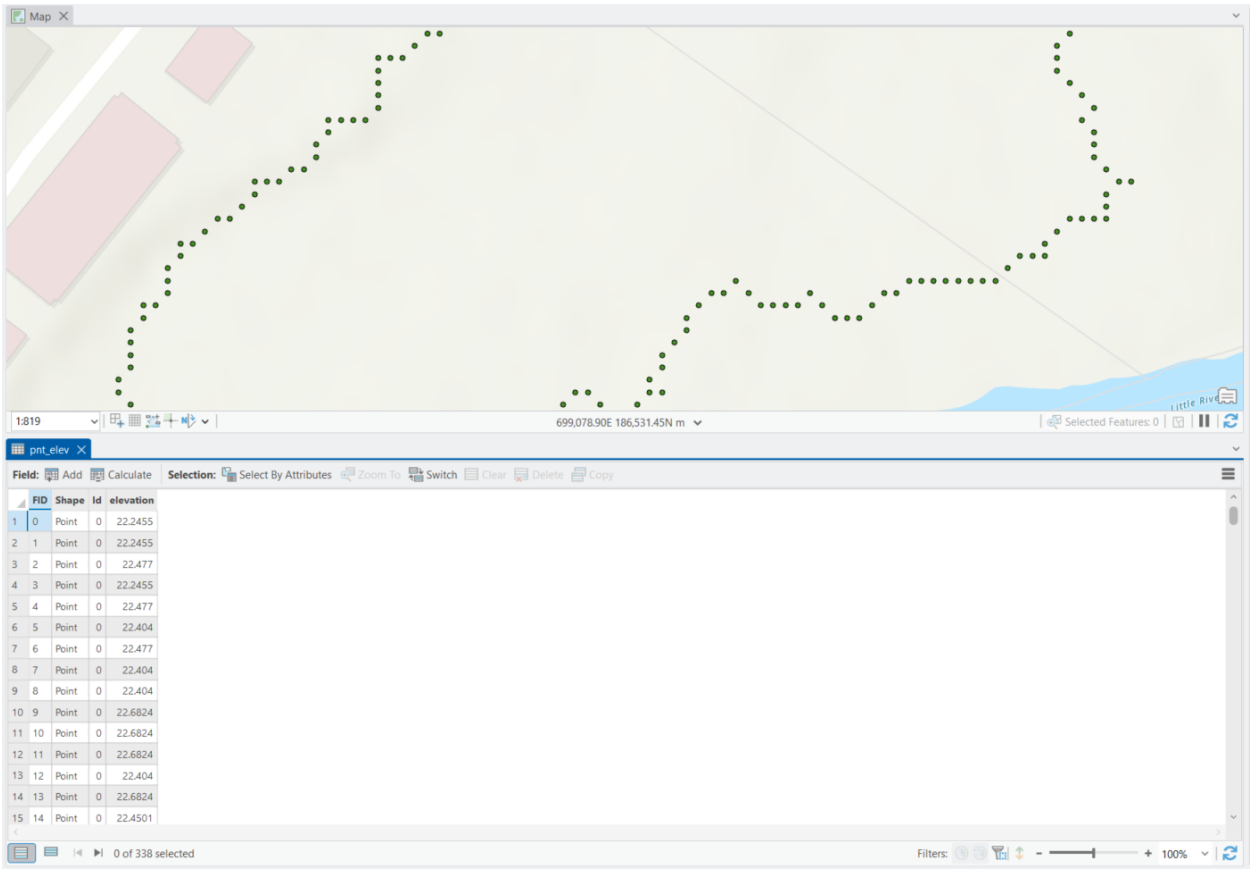
[18] ✓ 0.1s Python

Messages

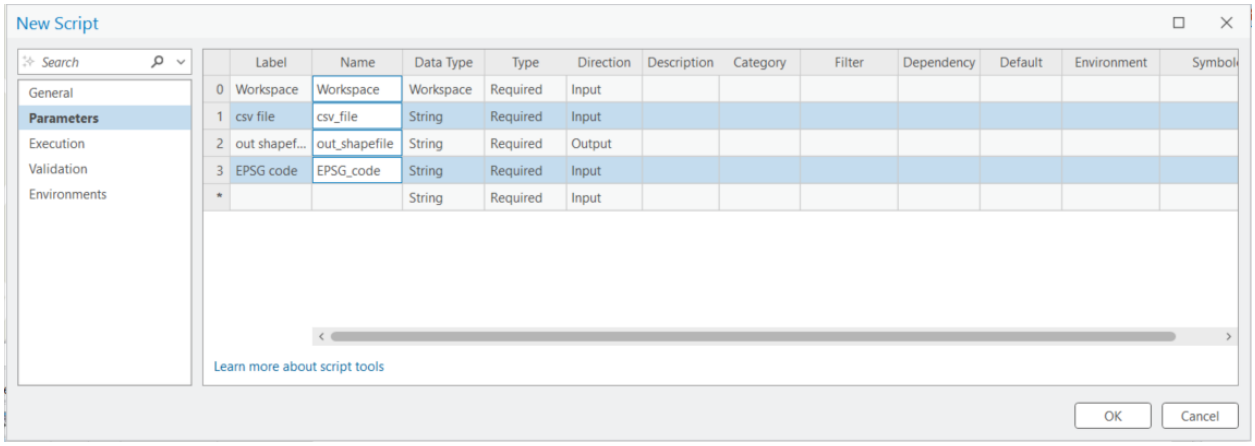
Start Time: Thursday, May 8, 2025 2:25:13 AM
Adding elevation to pnt_elev...
Succeeded at Thursday, May 8, 2025 2:25:13 AM (Elapsed Time: 0.04 seconds)

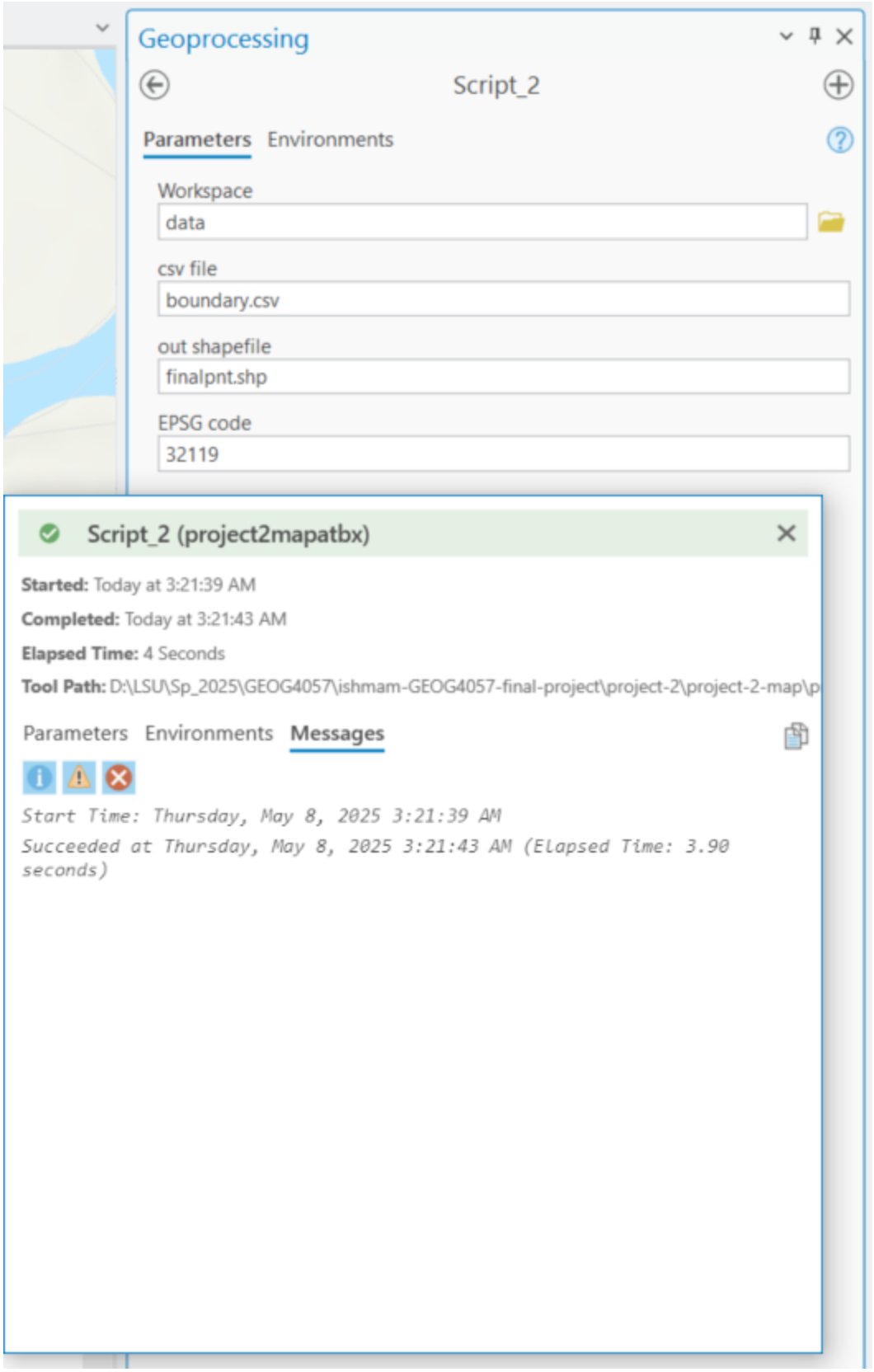
```
with arcpy.da.InsertCursor(fcname, ['SHAPE@', 'elevation']) as cursor:
    for feat in origin_info['features']:
        # get the coordinates and create a pointgeometry
        coords = feat['geometry']['coordinates']
        pnt = arcpy.PointGeometry(arcpy.Point(coords[0], coords[1]), spatial_reference=32119)
        # get the properties and write it to elevation
        elev = feat['properties']['elevation']
        cursor.insertRow([pnt, elev])
```

[19] ✓ 0.0s Python



5. Achieving the same objective using script tool in ArcGIS Pro




Geoprocessing
Script_2
Parameters
Environments
Workspace
data
csv file
boundary.csv
out shapefile
finalpnt.shp
EPSG code
32119
Script_2 (project2mapatbx)
Started: Today at 3:21:39 AM
Completed: Today at 3:21:43 AM
Elapsed Time: 4 Seconds
Tool Path: D:\LSU\Sp_2025\GEOG4057\ishmam-GEOG4057-final-project\project-2\project-2-map\p
Parameters
Environments
Messages
Start Time: Thursday, May 8, 2025 3:21:39 AM
Succeeded at Thursday, May 8, 2025 3:21:43 AM (Elapsed Time: 3.90 seconds)

Github repo:
https://github.com/ishmamshahid/ishmam-GEOG4057-final-project/tree/main/project-2