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GIS Process Log File

12/9/2022

| **Task No.** | **Task Description** |
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| 1 | Create a new GIS map project in the project directory. Select Light Grey Canvas as the basemap, and remove the reference layer. |
| 2 | Download shapefiles from the Pittsburgh PA GIS Open Data Portal:   1. Neighborhoods with SNAP Data ([link](https://pghgishub-pittsburghpa.opendata.arcgis.com/datasets/pittsburghpa::neighborhoods-with-snap-data/about)) as a geodatabase 2. City of Pittsburgh Boundary ([link](https://pghgishub-pittsburghpa.opendata.arcgis.com/datasets/pittsburghpa::pittsburgh-city-boundary/explore?location=40.430815%2C-79.979816%2C12.25)) as a shapefile   Unzip both of these files and move the resulting contents to the **data/** folder of the project directory |
| 3 | In the GIS Project, select Connections > Database > Add Database and select the Neighborhoods with SNAP Data, then adding the contained **.gdb** file (it should have a long name).  In the Catalog pane, drag and drop the “Neighborhood\_SNAP” layer from the new geodatabase into the project. |
| 4 | In the GIS Project, use the Feature Class to Feature Class tool to access the Pittsburgh\_City\_Boundary shapefile and import it into the project geodatabase. Title the output name “City\_Boundary”. |
| 5 | Perform the following steps to run the R script:   1. Select the GISProject.Rproj file to open the directory in RStudio 2. Select the “Source” button in the top-right corner of the script window pane, or on Windows press **Ctr**+**Shift**+**Enter** to run the entire script    1. If you run this for the first time without already having **Data/smell\_data.csv** downloaded, it will take around one minute to query all the data. 3. Close RStudio |
| 6 | In the GIS Project, use the Table to Table tool with the input rows as the smell\_data.csv file and the output name smell\_data.  Use the XY Table to Point with the following settings:   * Input Table: smell\_data * Output feature class: smell\_points * X Field: longitude * Y Field: latitude * Coordinate System: GCS\_WGS1984   Use the Erase Point tool to clip the smell reports layer to the Neighborhood\_SNAP layer, with the Operation Type setting set to “Outside” to eliminate all smell reports falling outside the city of Pittsburgh. |
| 7 | Download Shapefiles from the Alleghany County GIS Open Data Source   1. Water Features ([link](https://openac-alcogis.opendata.arcgis.com/datasets/AlCoGIS::allegheny-county-hydrology-areas/explore?location=40.434655%2C-80.022402%2C9.65)) as a shapefile   Unzip the file and move the resulting contents to the **data/** folder of the project directory. In the GIS Project, use the Feature Class to Feature Class tool to access the Hydrology\_Areas shapefile and import it into the project geodatabase. Title the output name “Water”. |
| 8 | Change the project coordinate system to NAD 1983 StatePlane Pennsylvania South FIPS 3702 (US Feet) |
| 9 | Right click the XY Point layer of smell reports and use the “Select By Attributes” tool. Use the condition where “smell\_category” is “low”. Right click the feature then press “Selection -> Make layer of selected features”. Rename the point layer “Smell Category: Low”  Repeat this two more times, replacing “Low” for “Medium” and “High” for a total of three new feature class items. Re-color each layer by the intensity of the smell. |
| 10 | Right click Neighborhood layer, adding a spatial join.  Relate the spatial join with target features of the Neighborhood layer and join features as the XY Point layer of all smell reports. Use the “intersect” match option, one-to-one” join operation, and delete all fields but one. Select the merge rule “count”. Run the join.  The Neighborhood layer should now have a column titled Join Count, which can be renamed to “Total Reports”.  Repeat the above step three times, changing the join features to the XY Point layers of high, medium, and low reports and adjusting the new column name in the Neighborhood layer. |
| 11 | Export the data of the Neighborhood layer as a new feature class.  Create calculated fields to calculate the percentage of reports falling under the low, medium, and high categories (divide count of reports over the count of total). |
| 12 | Duplicate this layer several times to create layers for each new visual:   * Percentage of Low (choropleth) * Percentage of Medium (choropleth) * Percentage of High (choropleth) * Percentage of High (centroids) * Area Median Income (choropleth) |
| 13 | For the choropleth report percentage layers, symbolize the neighborhood polygons as graduated colors using the percentage of smell reports by severity from the calculated fields. Use a similar approach for symbolizing Area Median Income from the Neighborhood SNAP layer data. |
| 14 | For the Area Median Income layer, symbolize the neighborhoods as graduated points based on the median income column from the Neighborhood SNAP data. |