Guide to Spatial and Attribute-based Joins

**Attribute-based Join**

This join links two columns, or “fields”, that have overlapping data, one field is in the table and one is in the map layer.

To access this tool: right-click on the **map layer to be joined**, choose Joins and Relates → Join

1. Choose field (column) from map layer
2. Identify the table to be joined
3. Choose the field from the table

Join Options: you can choose to keep or discard remaining unmatched records – ex: if your table contained data about 35 of the 50 US States, you could keep the other 15 states in the resulting table with “Null” values, or you could leave them out of the table

Validate Join will predict resulting errors and total values matched

<table>
<thead>
<tr>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Input Table" /></td>
<td><img src="image2" alt="Output Table" /></td>
</tr>
</tbody>
</table>

**Spatial Join**

This join links attributes between two map layers based on spatial relationship.

This tool can be used for points, lines, and polygon data.

To access this tool: right-click on the **map layer to be joined that contains the area that the join will be based on**, choose Joins and Relates → Join

Ex: joining zip-code data to the state-level, as seen above, right-click on the state layer to initiate the join, then:

1. Select the layer to load the spatial data from (ex: zip-code layer)
2. Choose how the feature attributes will be compiled in the resulting layer
3. Choose an output location – this tool generates a new layer

Q:\Classes\Workshops\Spring2015\Exercises\Joins Guide.docx
Updated: February 2015
Best Practices

1. Formatting the spreadsheet (or other input table) -- This is where most join-related troubleshooting occurs:
   a. Most important: remove all **spaces** and **symbols** from the table field names, and do not start field names with numbers!
   
<table>
<thead>
<tr>
<th>Prof Class</th>
<th>Zip#</th>
<th>NowZip</th>
<th>2005 Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1038</td>
<td>01038</td>
<td>Portland, OR</td>
<td></td>
</tr>
<tr>
<td>0 1027</td>
<td>01027</td>
<td>Dallas, TX</td>
<td></td>
</tr>
<tr>
<td>0 3633</td>
<td>03633</td>
<td>Redlands, CA</td>
<td></td>
</tr>
</tbody>
</table>

   **Bad**

<table>
<thead>
<tr>
<th>Prof Class</th>
<th>Zip</th>
<th>NewZip</th>
<th>Location</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1038</td>
<td>01038</td>
<td>Portland, OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 1027</td>
<td>01027</td>
<td>Dallas, TX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 3633</td>
<td>03633</td>
<td>Redlands, CA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   **Good**

   b. Exporting the spreadsheet as a .csv (comma-separated values) will remove the formatting, which makes it easy to read by the GIS. Using Sheet1 from an expanded .xls will also work, but may have more formatting/conversion issues.
   c. Depending on the format of the table data you may need to **summarize data**.
   d. When using data like the zip codes seen above it is challenging to retain the “0” in codes like “01060”. Either save the spreadsheet field as a string/text and save as .xls or transform the field in the map layer to an integer by **adding a field** and **field calculating**.
   e. Make sure the values in your matching fields align – NORTHAMPTON and Northampton will **not** be recognized as the same, neither will New London and New_London – use a formal in excel to transform the values to match. Remember -- consistency is critical!

2. Post-join Results: Once the join is made look at the attribute table of the map layer for results
   a. Export the map layer to permanently join the table and map layer in a new layer: right-click layer go to **Data ➔ Export Data**
   b. The resulting attribute table may have an overwhelming number of fields. These can be turned off in the properties window under **Fields tab**. Field can be deleted individually by right-clicking field name in attribute table and clicking delete, and collectively by exporting the data AFTER turning the unwanted fields off in the **Fields tab**.
   c. Joins can be removed by right-clicking layer, **Joins and Relates ➔ Remove Joins**

Resources:

Esri Joins and Relates by Attribute:

Esri Join Troubleshooting:

Attend SAL lab hours: [www.smith.edu/gis](http://www.smith.edu/gis) Set up a meeting, email: SAL@smith.edu