# Query Selection

This tutorial outlines steps for selecting a subset of a database using ArcGIS Pro.

1. Run ArcGIS Pro and sign in. (Contact maplib@brocku.ca for access to ArcGIS Pro)
2. On the right side of the screen, select the **Blank** icon to create a new project.
3. Name the project and use the directory to navigate to an appropriate location for your items to be stored and saved. Select OK to continue.
4. Under the **Insert** tab, click **New Map**
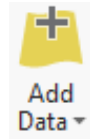
Adding data

1. Click the Map tab and click the Add Data button.
2. Navigate to P:\MAP_Library\QueryArcGISPro\EPOI.shp
3. Click OK to add the Enhanced Points of Interest (EPOI) data to the map.
4. The default symbology may appear faint. Click the dot symbol in the Contents pane at the left of the map window. The symbology pane is activated.
5. Click a bright coloured symbol. Notice the change in the Contents pane and on the map.

Selection Process

This dataset includes points of interest for all of Ontario. We would like to isolate just the universities. A powerful function of GIS is the ability to query a dataset based on location or attributes. The following steps outline the process for creating a subset of data based on attributes.

1. Click the EPOI data layer under CONTENTS to activate it.
2. From the **Map** tab at the top of the window, click **Select By Attributes**. The tool opens in the Geoprocessing pane to the right of the map window.
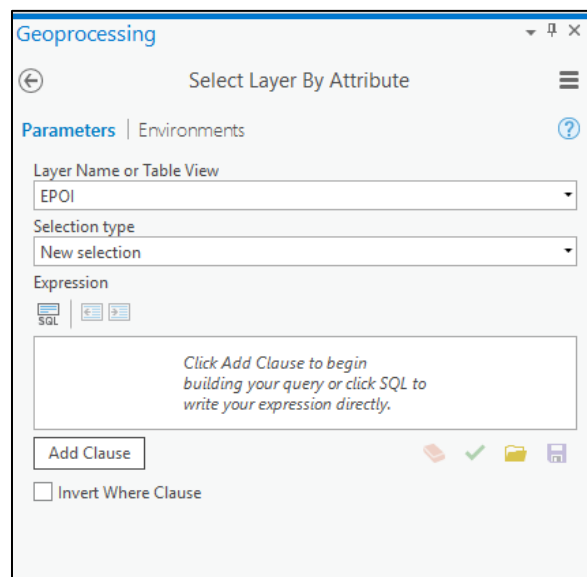

3. Below the Expression window, click **Add Clause**.
4. From the Field dropdown, select **NAME**.

5. From the operator dropdown, select **contains the text**
6. Type in the term UNIVERSITY making sure to type using ALL CAPS.
7. Click **Add**.
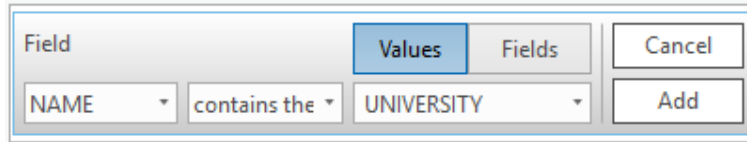
8. It is possible to add multiple clauses but for the purposes of this tutorial we will limit it to just one.
9. Click the green checkmark to verify the SQL expression is valid.
10. Click Run (bottom right of the window).
11. The selected points are highlighted on the map.
12. To make a new layer of the selected features, right-click EPOI layer under Contents and select Data > Export Features. The Copy Features tool opens in the Geoprocessing pane to the right.
13. Change the output Feature Class name to UNIVERSITIES.
14. Click Run. The Copy Features tool intuitively applies the export to selected features only.
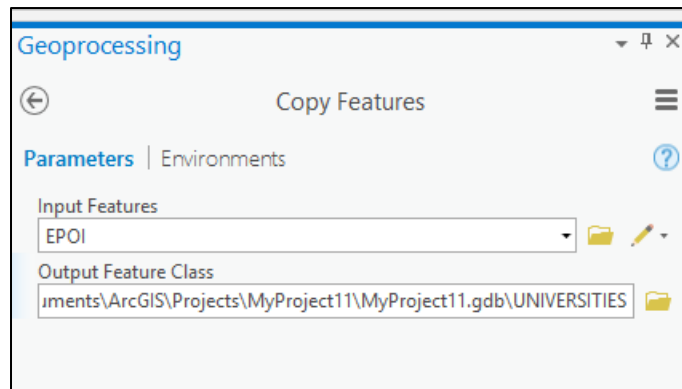

15. Turn off the EPOI layer and change the symbology of universities to make them more visible.

As part of the learning process we'd like to identify universities within the Greater Toronto-Hamilton Area. We will perform a spatial selection based on a boundary file downloaded from Scholars GeoPortal.

1. Click the Map tab and click Add Data.
2. Browse to and select P:\MAP_Library\QueryArcGISPro\GTHA_Boundary_DMTI.shp
3. Click OK.
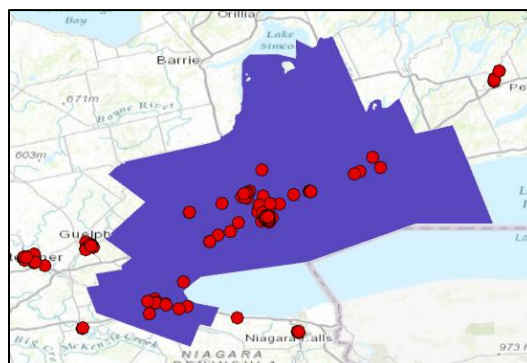
4. Click the UNIVERSITIES layer to activate it.
5. From the Selection toolset, click **Select by Location**. The tool opens in the panel to the right of the map view.
6. The Input Feature Layer should be UNIVERSITIES.
7. Under Relationship, select Completely Within.
8. Under Selecting Feature, choose GTHA_Boundary.
9. Click Run (bottom of the tool pane).
10. All universities found within the boundary file are selected.
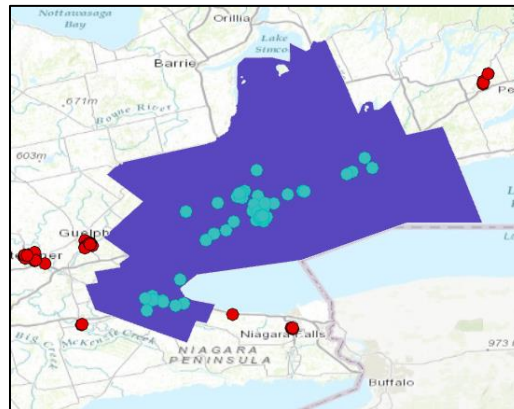
11. To make a separate layer, right click the UNIVERSITIES layer and select **Data > Export Features**.
12. Change the output feature class name to UNIVERSITIES_GTHA and click Run.
13. The new selection is added to the map. Turn off the original UNIVERSITIES layer.
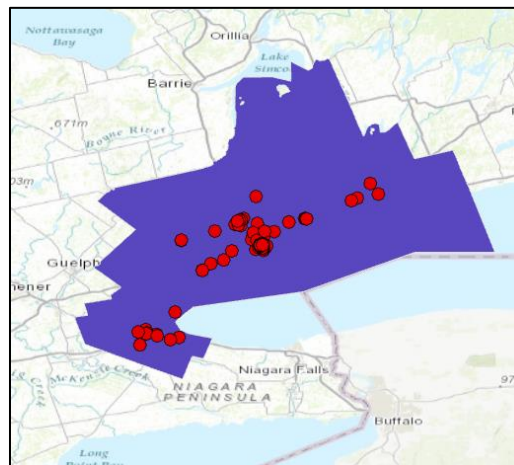
OPTIONAL:
The results from our query look good, however, a quick study of the attribute table tells us that more than just UNIVERSITIES were included in the query. For example, any records with the word 'university' in the name were also selected. To clean up the data, we will need to remove unwanted records using another Select by Attributes query.

The attribute data includes SIC and NAIC codes. These are industry standard classification systems. The NAICS code for Colleges, Universities and Professional Schools is 61131. We will use this to create a new selection.

1. Select UNIVERSITIES_GTHA in the Contents panel.

2. Click **Select by Attributes**.
3. The **Layer Name** should automatically be filled with UNIVERSITIES_GTHA.
4. Click **Add Clause**.
5. Fill in the various fields as follows and click **Add**.

6. Confirm that the dialogue box resembles the following graphic then click **Run**.

7. Create a new feature layer. HINT: Right-click UNIVERSITIES_GTHA and select Data > Export Features.
8. The new layer will be added to the map.