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Performing Analysis in ArcGIS Online

This document contains step-by-step instructions on how to use the 'Find Nearest' analysis tool in order to create a flowline map.

The **Perform Analysis** function on ArcGIS Online allows users to access a range of virtual tools that make analysis and measurement of geographic relationships possible. This is useful as maps are used to identify patterns and relationships, assess trends, and make decisions. This is called spatial analysis.

In this instructional document, you will learn how to use some analysis tools to create simple, yet useful, manipulations to your data in order to identify patterns and relationships, assess trends, and make decisions.

NOTE:

Performing Analyses will use your organisational credits. Administrators can manage credits in several ways, including allocating specific quantities of credits to each member. Administrators can also monitor their members' credit usage through dashboards, charts and reports.

If your organisation is part of the *GIS for schools* program, it will begin 200,000 credits. This is a large amount of credits and you shouldn't worry about running out.

Creating a flow line map with the 'Find Nearest' analysis tool

A flow map is a type of thematic map used to show the movement of objects or phenomena between different areas. These types of maps may show things like the movement of trade goods or migration patterns. Line symbology and width are used to distinguish between classes of data.

In this tutorial, you will be mapping migration data to Australia.

Part 1: Finding and cleaning your data

Normally, your first step would be to find or locate data, clean your data in a spreadsheet and then save that spreadsheet as a CSV file so that ArcGIS Online is able to import it. You can learn how to clean data here.
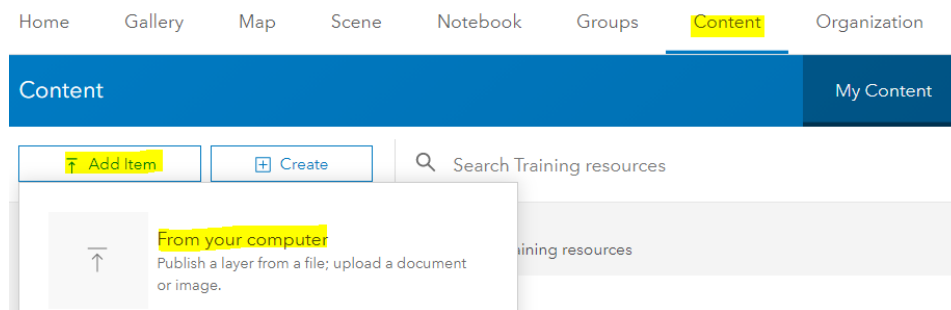
For training purposes, pre-prepared data has been located, cleaned and saved in a CSV file for your use.

1. Download the pre-prepared .csv spreadsheet titled *Training – Creating a flow line map*, which is available on the same webpage you accessed this guide. Save it to a location on your computer that you can easily access.
   - This dataset features the top 10 countries of where migrants have come from before migrating to Australia. It has been accessed from the Australian Bureau of Statistics via this webpage.
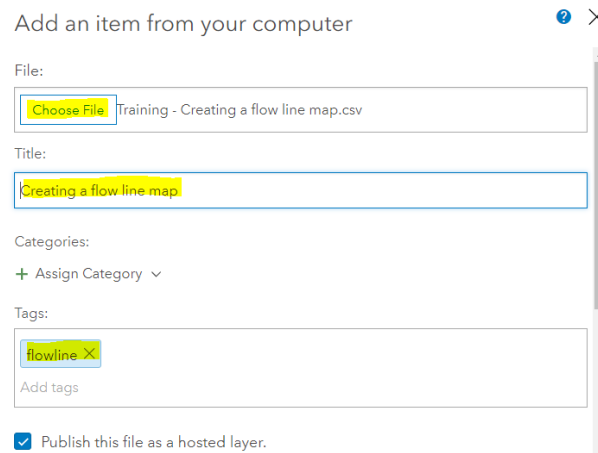
Part 2: Adding the data to your map

Note: This tutorial will be using the *ArcGIS Online 'Classic map viewer'* as opposed to *'(New) Map viewer'* that was introduced in 2021. The steps are largely identical, the only difference being the layout and user interface of each map viewer.

1. Login to ArcGIS Online and navigate to the **Content** pane. Click on **Add Item** and select **From your Computer**.

2. Click on **Choose File** and locate the training data csv. file you saved to your computer in Part 1 of this tutorial. Change the title so that it doesn't have any special characters. Add a Tag.

3. Under **Locate features by**, select **Addresses or Places**. Below this, open the drop-down menu and select **World.** In the table, change the **Location Field** from 'Not used' to 'Country' for the **Country_of_Origin** field name. See the image below as a reference.
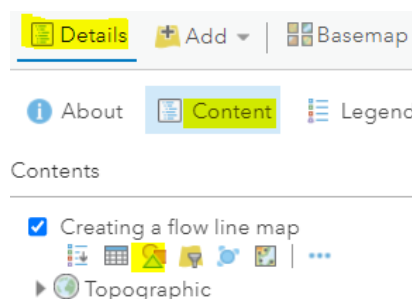

4. Click **Add Item**.
5. You have now created a feature layer from the csv. file. The item's overview page will open. Open the feature layer in *Map Viewer Classic*.

6. Your data will appear on a map as location-only. In the **Details** pane, select **Content**. Hover over the layer you just brought in: *Creating a flow line map*. Choose the **Change style** button 🖼 .

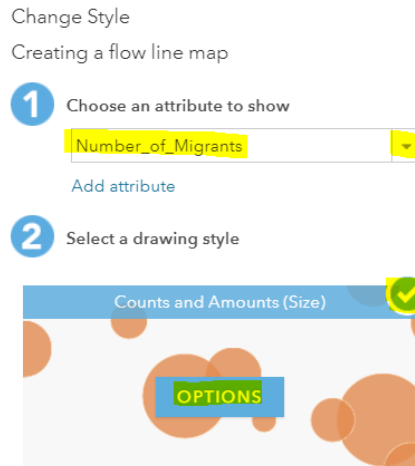   **Note**: if these extra buttons don't appear, try clicking on the layer's name.

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7. Under **Choose an attribute to show**, open the drop-down menu and select **Number_of_Migrants**. Under **Select a drawing style**, choose **Counts and Amounts (Size)**. Then click **Options**.
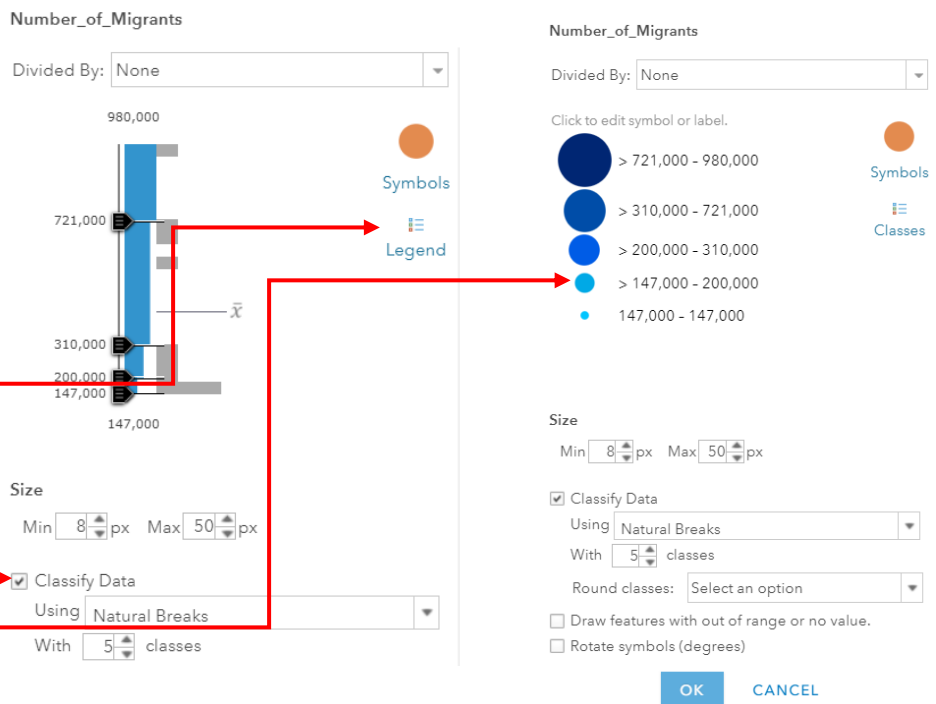

8. If you wish to make some changes to the class breaks and create a graduated colour symbology, then follow the steps outlined below.

1. To manage how many classes your data is displayed in and how these classes are separated, click **Classify Data.**

2. To make symbology changes, you need to first **Classify Data.** Once you have, click on the Legend button.

3. Click on each circle to bring up symbology options like colour or shape. Make changes as needed.

9. Click **OK** and then **Done** to apply these changes to your layer.

10. Your map should now look similar to the image below:

11. Return to the **Content** pane. Hover over (or click) your layer title. Click on the **More options (…)** symbol. Select **Rename** and rename your layer to *'Total number of migrants to Australia from top 10 countries'* and click **OK.**
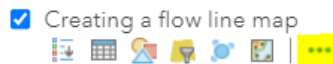

12. Save your map.

Part 3: Adding a map note (point layer) to your map

1. Click **Add** ⊞ Add ▾ . Select **Add Map Notes**.
2. Type 'Australia' for the name. Click **Create**.

Add Map Notes

Name: Australia

Template: Map Notes ▾

Use Map Notes to create basic shapes in a
wide variety of applications.

CREATE   CANCEL

3. In the **menu** that appears, choose a point symbol (e.g. stickpin) and place it on the centre of Australia. You are placing it on the centre of Australia as the data we added earlier is showing migration to Australia.

Add Features

Australia - Points

Stickpin   Pushpin   Cross

4. Save your map.

Part 4: Perform analysis to create a flowline map layer

1. Zoom out to a map extent where all of the data is visible. You can do this by physically zooming out or by clicking on the **More Options (…)** button for your *Total number of migrants to Australia from top 10 countries* layer and selecting **Zoom to**.

☑ Total number of migrants to Australia from top 10 countries

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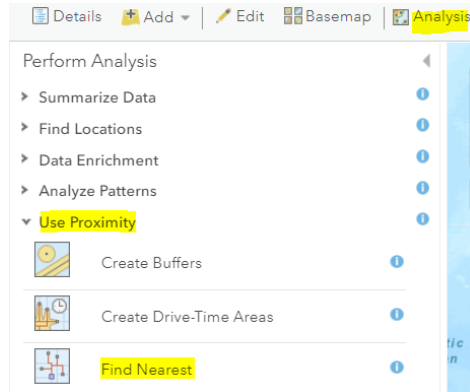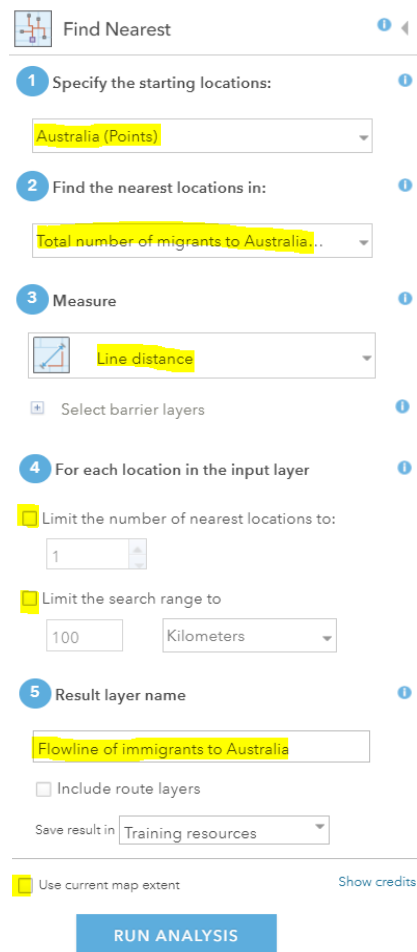2. Click on **Analysis**. Select **Use Proximity**. From the drop-down menu, click on **Find Nearest**.

3. In the menu that appears, follow the settings as communicated below:

1. Ensure that the map note layer [*Australia (Points)*] is selected. This should already be selected by default.

2. Ensure that the *Total number of migrants to Australia from top 10 countries* layer is selected. This should already be selected by default.

3. Ensure that *Line distance* s selected for **Step 3 – Measure**. This should already be selected by default.

4. Uncheck the two checkboxes in Step 4.

5. Rename the result layer name that will be created to reflect what the flowline will display.

6. Uncheck 'Use current map extent'. When you have completed these steps, click **Run Analysis.**
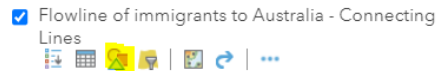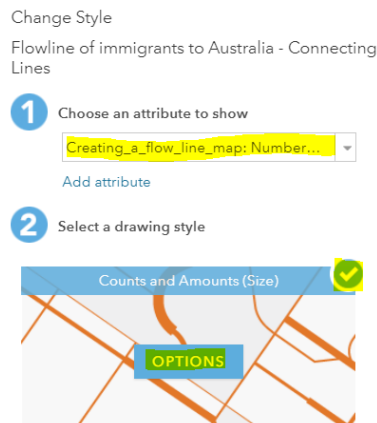
4. Once the analysis has been completed, two new layers will be created.
   - Flowline of immigrants to Australia (Points)
   - Flowline of immigrants to Australia (Connecting lines)

Part 5: Symbolise your 'connecting lines' layer

1. Hover over the '*Flowline of immigrants to Australia – Connecting Lines'* layer and select **Change style**.

   ☑ Flowline of immigrants to Australia - Connecting Lines

2. Under **Choose an attribute to show**, select *'Creating_a_flow_line_map: Number_of_migrants'* from the drop-down menu. Under **Select a drawing style**, select **Counts and Amounts (Size)**.

   Change Style
   Flowline of immigrants to Australia - Connecting Lines

   1 Choose an attribute to show
      Creating_a_flow_line_map: Number... ▼
      Add attribute

   2 Select a drawing style

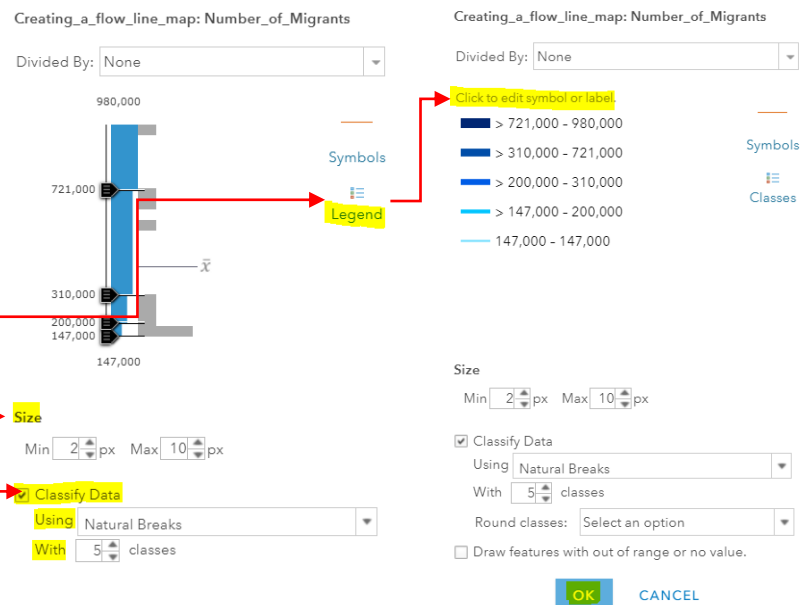   Counts and Amounts (Size) ✓

      OPTIONS

3. Click on **Options**. Symbolise your lines.

   Experiment with the minimum and maximum size of your flowlines.

   Classify data. Set your breaks and number of classes. It is recommended that you match the class settings you chose earlier in Part 2, Step 8 of this guide.

   Note: You will need to classify data for the '**Legend**' button to appear. This will allow you to change the colour of your flowlines using a graduated theme.

   Creating_a_flow_line_map: Number_of_Migrants

   Divided By: None ▼

   980,000

   721,000

   310,000
   200,000
   147,000

   147,000

   $\bar{x}$

   Symbols

   Legend

   Size

   Min 2 px Max 10 px

   ☑ Classify Data
      Using Natural Breaks ▼
      With 5 classes

   Creating_a_flow_line_map: Number_of_Migrants

   Divided By: None ▼

   Click to edit symbol or label.

   ▬ > 721,000 - 980,000
   ▬ > 310,000 - 721,000
   ▬ > 200,000 - 310,000
   ▬ > 147,000 - 200,000
   ▬ 147,000 - 147,000

   Symbols

   Classes

   Size
   Min 2 px Max 10 px

   ☑ Classify Data
      Using Natural Breaks ▼
      With 5 classes
      Round classes: Select an option ▼

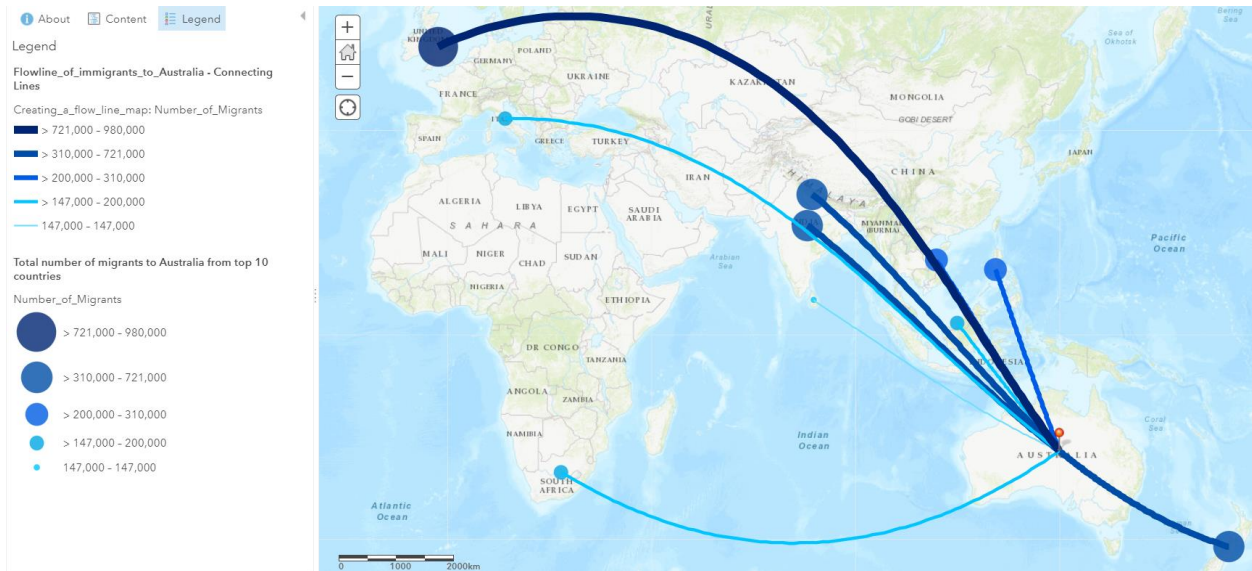   ☐ Draw features with out of range or no value.

   OK   CANCEL

4. Press **OK**, then **Done** to apply your changes.

5. Return to the **Contents** of your map. Turn off unnecessary layers.

6. Save your map.

Congratulations! You have now created a flowline map displaying the total number of migrants to Australia from the top 10 countries. Your map will look like the map displayed below:

Next Steps:

Request a free ArcGIS Online Account for your school:

Australian schools can request a free ArcGIS Online account as part of Esri Australia's Classroom GIS Initiative. A school subscription provides additional map layers, content, features and privacy. Learn more about ArcGIS Online, and apply for your ArcGIS Online School subscription at http://esriaustralia.com.au/education

Speak to Esri Australia's Education Program Manager:

Australian schools can seek additional support or speak to our Education Program Manager by emailing education@esriaustralia.com.au.