

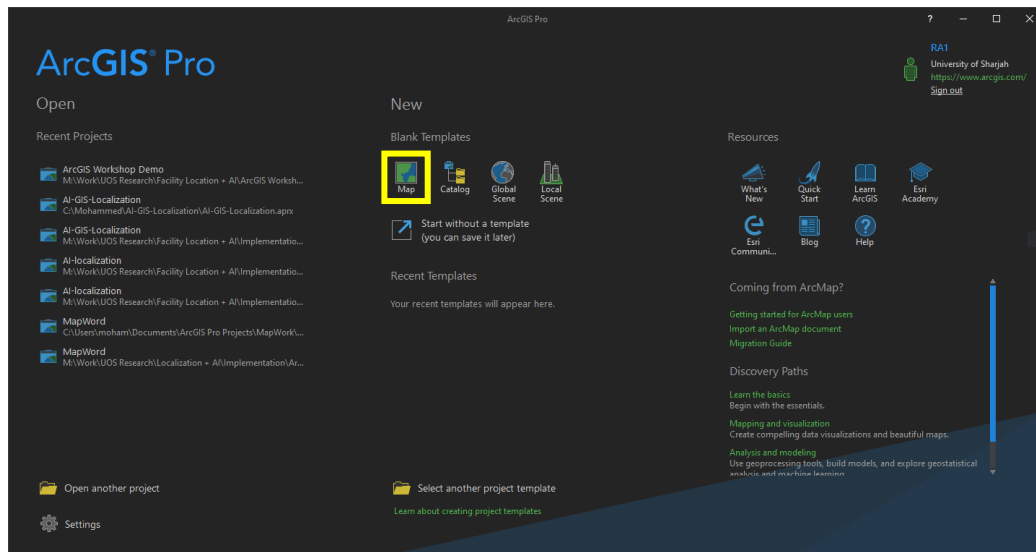
ArcGIS Introduction

Workshop Manual, Mohammed Al-Haidary

In this project, we will generate a random point to represent our home within Dubai, and then we will find the closest medical facilities to it.

Creating a project

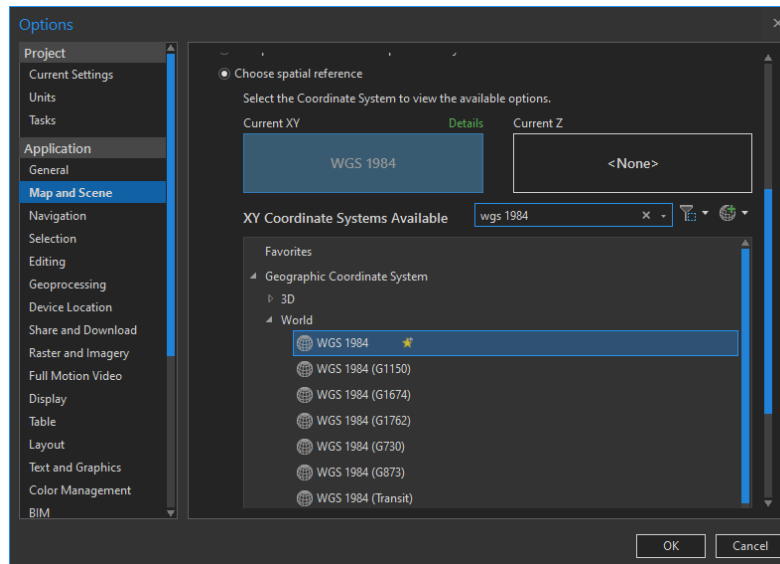
1. Click the 'Map' template to create a new project with a base map. Save the project to the desired location.



Setting up the workspace

Setting the Coordinate System

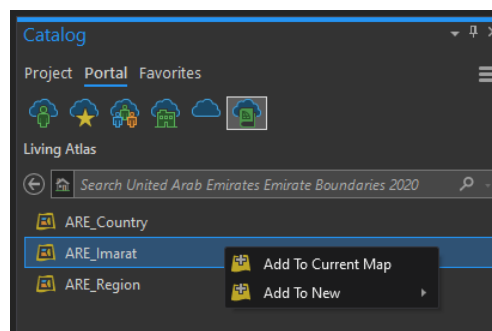
1. Go to 'Project' on the top-left corner, then click on 'Options'.
2. Click on 'Map and Scene' from the left pane, then expand the 'Spatial Reference' options.
3. Check the 'Choose spatial reference' radio button.
4. Search for 'WGS 1984' then select it from under Geographic Coordinate System -> World -> WGS 1984. Click OK.



1. From the top toolbar, under 'Map', click on 'Basemap', and select the visual map style that you like to work with. It is recommended to select 'Dark Gray Canvas' which is easier on the eyes.

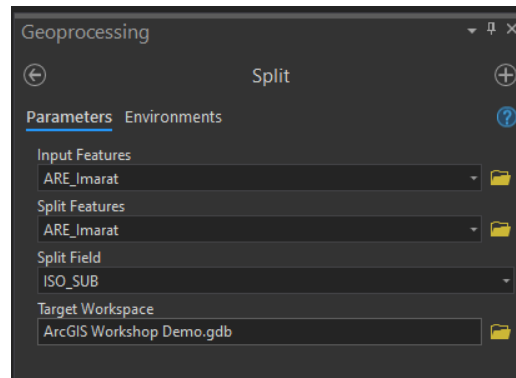


1. From the top toolbar, under 'View', click on the 'Catalog Pane' if it is not already visible for you.
2. Then within the catalog pane, under 'Portal', click on the last icon saying 'Living Atlas'.
3. Search for the 'Emirates Boundaries', then double click on 'United Arab Emirates Emirate Boundaries 2020' to open its contents.
4. Right click on 'ARE_Imarat' and click on 'Add To Current Map' to import it into the project.



Extracting the Dubai Feature

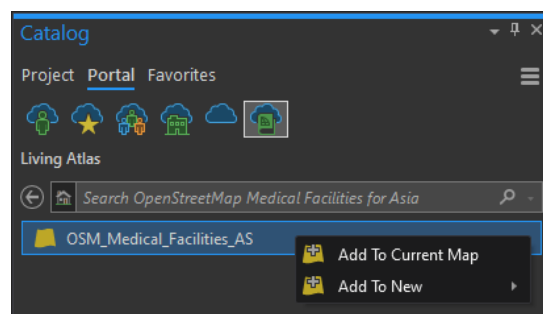
1. From the top toolbar, under 'View', click on 'Geoprocessing' if it is not already visible for you.
2. Then search within the geoprocessing pane for the 'Split' tool and click on it.
3. Fill the fields for the ARE_Imarat feature class we just imported as shown below. The split field option is the feature field that is unique to each feature in our input feature class. The target workspace is the project's geodatabase.



We now have created a feature class, each containing one feature which is a polygon marking the area of each emirate in the UAE. Go to 'Add Data', under 'Map' from the top toolbar, then navigate to the projects geodatabase before importing 'DU' into the project. This is the feature class representing the area of Dubai.

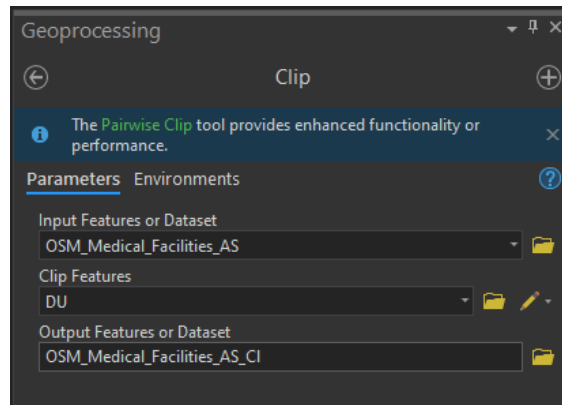
Importing the Medical Facilities

1. From the Living Atlas within the Catalog Pane, search for 'Medical Facilities Asia', then double click on the 'OpenStreetMap Medical Facilities for Asia' search result to view its contents.
2. Right click on 'OSM_Medical_Facilities_AS' and click on 'Add To Current Map' to import it to the project.



Clipping the Medical Facilities for Dubai

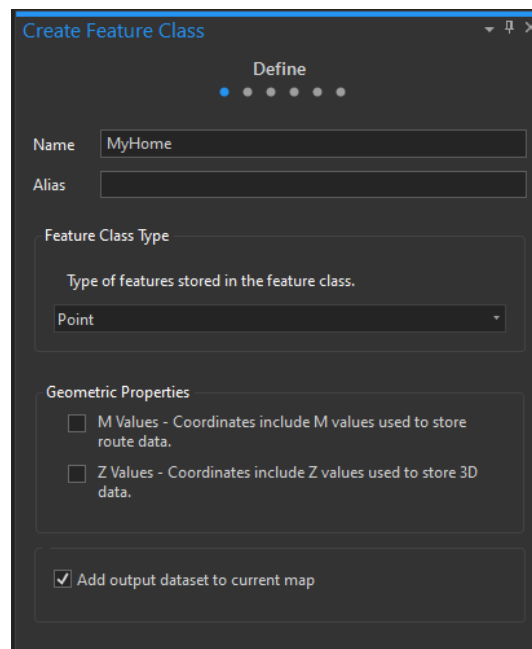
1. Go back to the geoprocessing pane and search for the 'Clip' tool, then fill the fields as follows. This will filter only the medical facilities dataset that within Dubai.



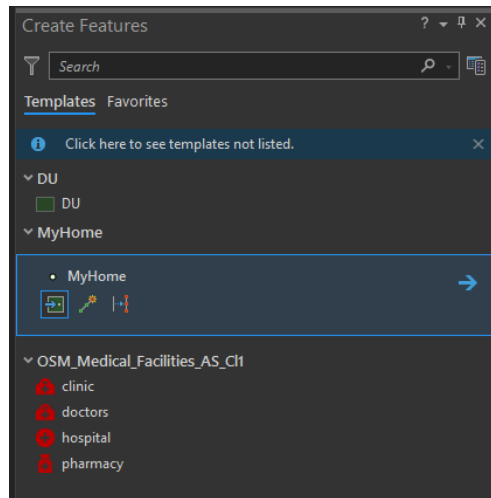
Creating Home Feature Class and Point

Finally, let us create a point within Dubai which will represent home.

1. From the catalog pan, go to the 'Project' tab, then expand the 'Databases' entry, this will show the project's geodatabase.
2. Right click on the geodatabase and click on 'New' -> 'Feature Class'.
3. Enter the name of the feature class 'MyHome', select 'Point' from the 'Feature Class Type' dropdown menu, and uncheck 'Z Values' from under the 'Geometric Properties'.
4. Click 'Finish'.



5. From the top toolbar, under 'Edit', click on 'Create'. In the create features pane, click the 'MyHome' class, and then click on the first tool to enter point creation mode.



6. Click at a desired point within the map view to create a point within the 'MyHome' feature class.

Running the Code

Find the ArcGIS Python Virtual Environment

1. In the ArcGIS Pro software, navigate to 'Project' from the top left corner.
2. Go to the 'Python' tab from the left hand side. This will show the path to the Python virtual environment under 'Project Environment'.
3. Navigate to and copy this path then append '\python.exe' at the end of it. Type it within a pair of double quotes and save this path somewhere for later use.

Obtaining the Script

1. Download the script.py file from the link below:

github.com/Mohammed-AI-Haidary/ArcGIS-Workshop-Demo

2. Save the script file adjacent to your project's geodatabase at the location: '<Your-Project-Name>\<Your-Project-Name>.gdb', where '<Your-Project-Name>' is the name of your ArcGIS project.

3. If you saved the script file at a location other than the one described above, then you will have to change the 'workspace_path' value in the 'env_params' dictionary within the script file. If you have changed the names of the layers within ArcGIS Pro, then you will have to change the names of the values in the 'feature_classes' dictionary under the 'read_data' method accordingly.
4. You are free to change the parameter of the 'find_closest(..)' method called near the end of the script file to the desired number of medical facilities to be found. Be sure that it does not exceed the total number of facilities in the dataset.
5. To run the script, navigate with VS Code's terminal to the folder where the script is saved. Enter the path ending with '\python.exe' saved from the earlier step and type them within double quotes, followed by 'script.py', or the name of the script file if you have changed it.

Viewing the Results in ArcGIS Pro Software

1. Right click on your geodatabase from the catalog pane and click 'Refresh'.
2. Import the 'Results' feature class from within the geodatabase into the project.
3. You can change the symbology and color of newly imported features to make them visibly more prominent.

These steps have to be taken every time the script is run in order to view its results.

Below is an example my results with modified symbology. The red symbols are some of the surrounding medical facilities. The house symbol at the center is my created home point. The yellow circles represent the resulted medical facilities calculated to be the closest to my home.

