FACULTY OF BUILT ENVIRONMENT AND SURVEYING
SEMESTER I, SESSION 2025/2026

ASSIGNMENT 2

SBEG1443 : PRINCIPLES OF GEOGRAPHIC INFORMATION SCIENCE

SECTION EB1

NAME:

1. SYAEEDA KHANUM BINTI ROSLI (A24CS0299)
2. DANISH FARIS BIN SUKHAIRUL NIZAM (A24CS0242)
3. YASMIN BATRISYIA BINTI ZAHIRUDDIN (A23CS0201)
4. NABIL AFLAH BOO BINTI MOHD YOSUF BOO YONG CHONG (A23CS0252)

GROUP NUMBER : 01

LECTURER'S NAME : DR. MOHAMMAD ZAKRI BIN TARMIDI

Table of Contents

1.0 Importing Spatial Features into Geospatial Database **1**

2.0 Table and Data Editing **3**

2.1. Attribute Table Editing 3

2.2. Spatial Data Editing 5

3.0 Spatial and Attribute Query **6**

3.1. Spatial Query 6

3.2. Attribute Query 7

4.0 Example of Buffer, Clip and Merge Analysis **8**

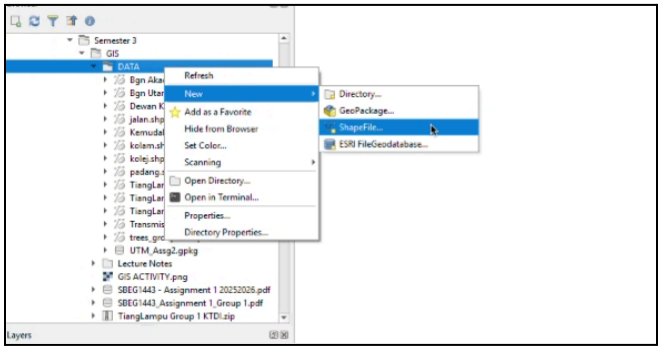
4.1. Buffer Analysis 8

4.2. Clip Analysis 9

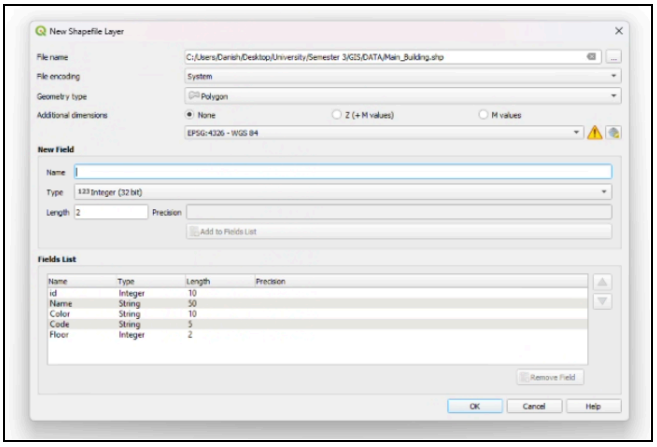
4.3. Merge Analysis 10

1.0 Importing Spatial Features into Geospatial Database

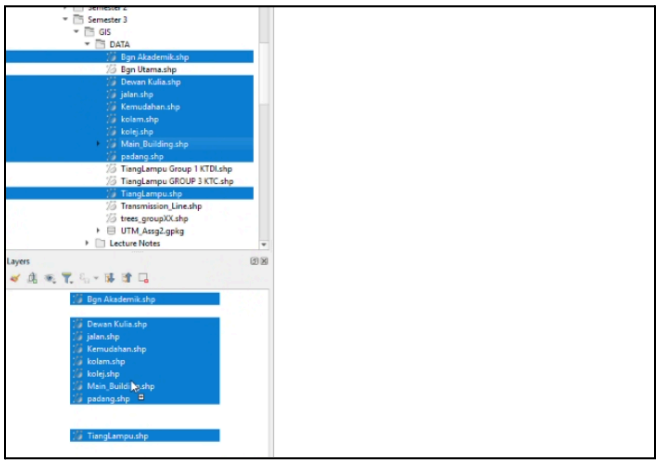
Step 1: In the Browser panel, right click on the destination folder where it wants to be saved. Hover over New, then click on ShapeFile to create a new geospatial database.



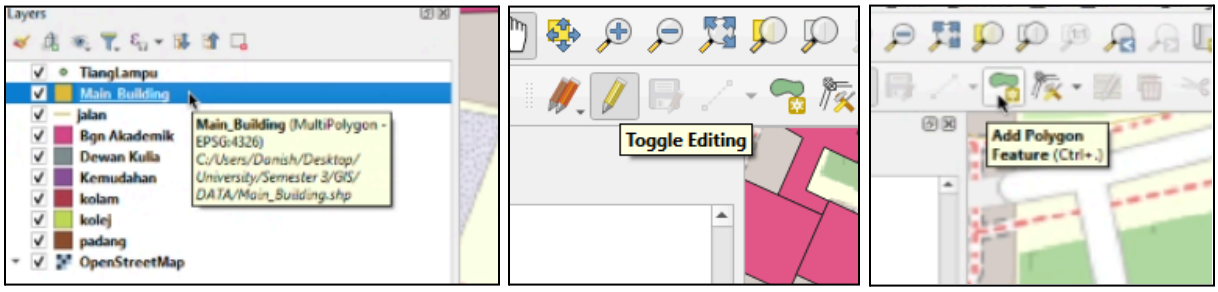
Step 2: Rename the file to *Main_Building.shp* then change the geometry type to Polygon. Fill in the field list and delete the id field list.



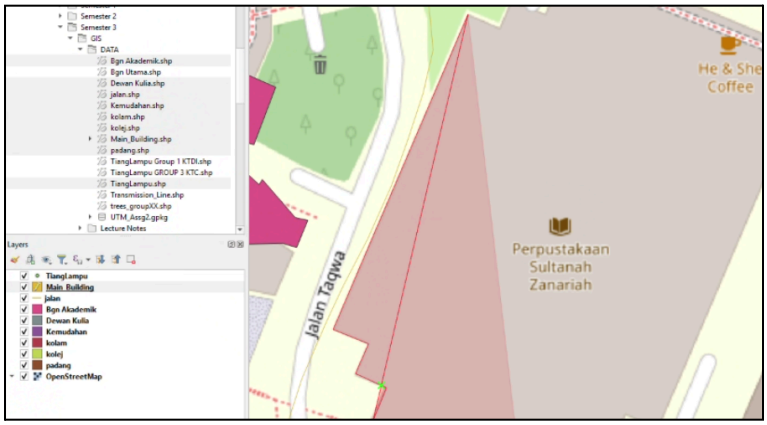
Step 3: Drag all the appropriate features in the Browser panel to the Layers panel.



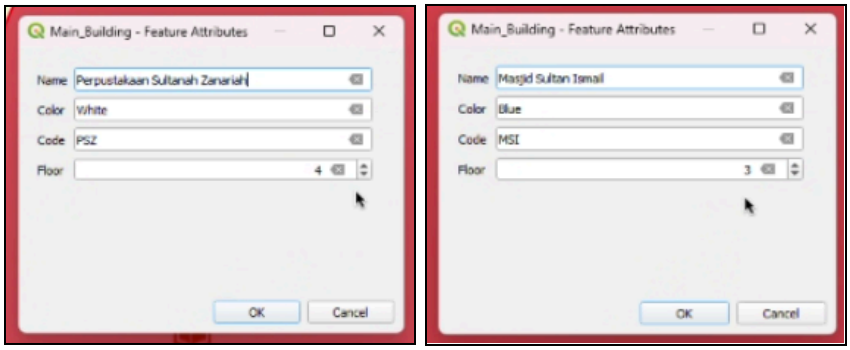
Step 4: Select the Main building and click on the Toggle Editing icon to allow editing. Then select the Add Polygon Feature icon to add a new structure to the map.



Step 5: By using the polygon features, click on the edges of the building to make a sketch and connect them all.



Step 6: Fill in the feature attributes with its data. Repeat as much data as you require.



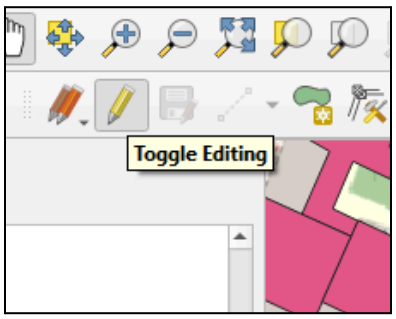
Discussion

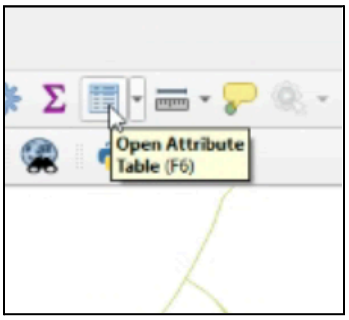
This part demonstrates how to import layers into a GeoPackage to ensure all spatial features are stored in a single and structured file. This method keeps the project easier to manage and prevents file clutter. Overall, this process simplifies the workflow.

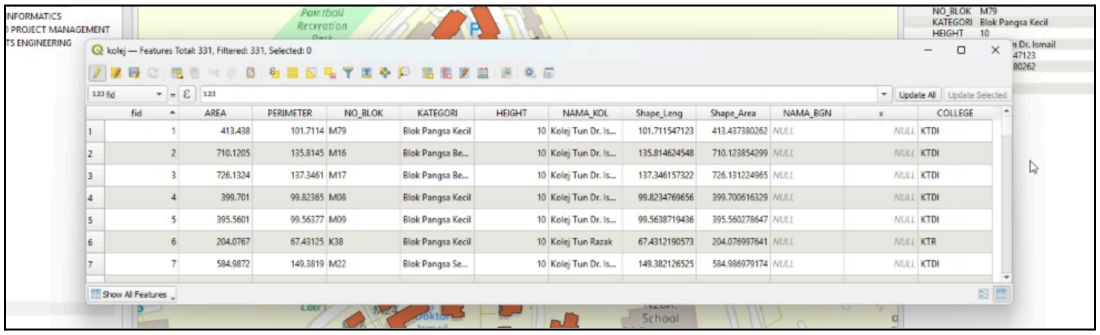
2.0 Table and Data Editing

2.1. Attribute Table Editing

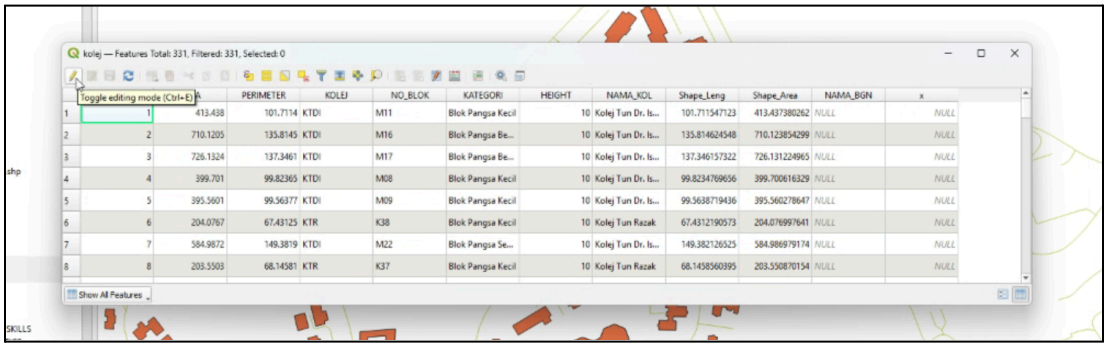
Step 1: Click Toggle Editing icon, then click the Identify Feature icon, select any building and click Open Attribute Table to view the data.



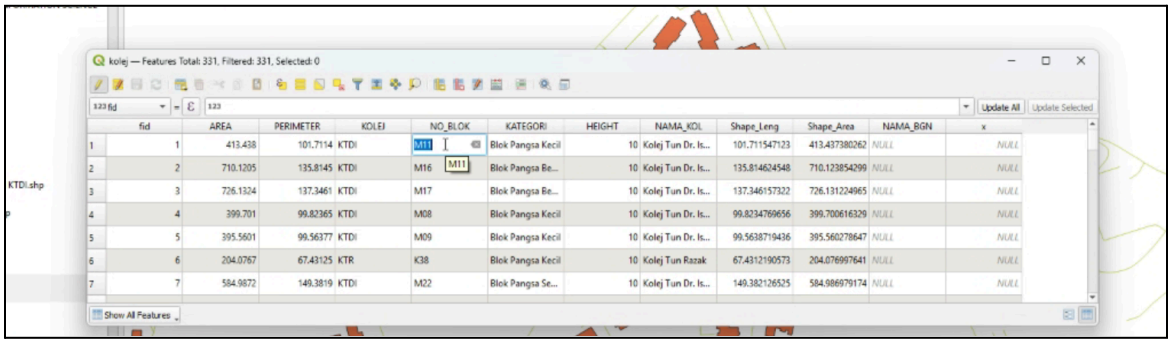




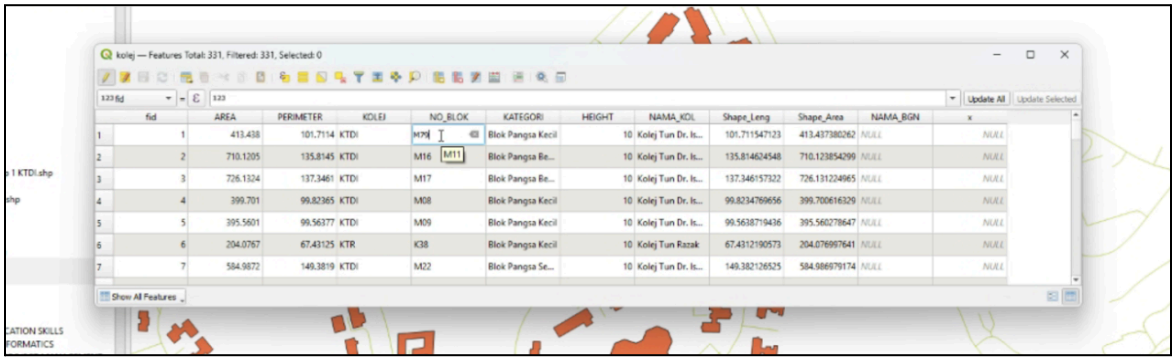
Step 2: Click Toggle Editing mode to edit the attributes.



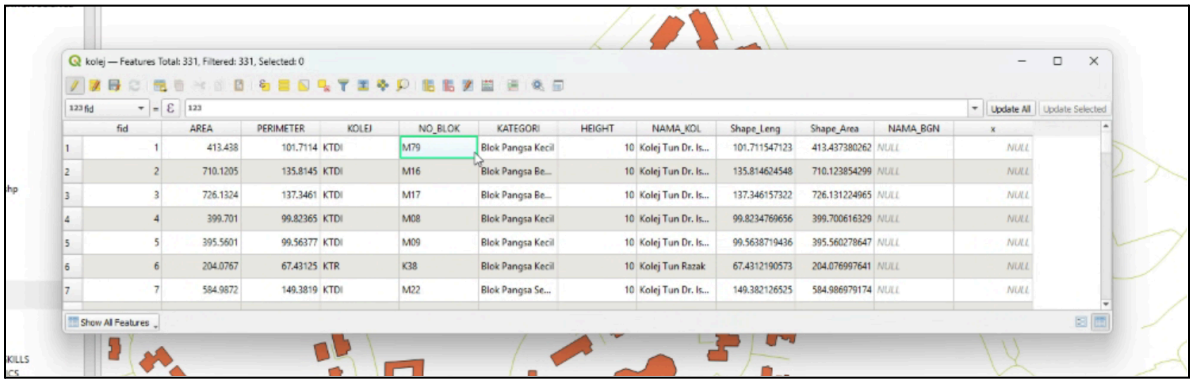
Step 3: Double click on the specific cell that wants to change.



Step 4: Rewrite any desired value to update the data.



Step 5: Click Enter and the new value is updated in the attribute table.



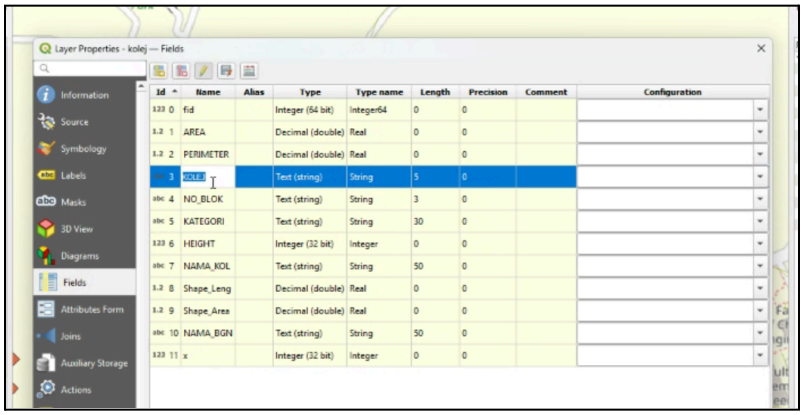
Discussion

This step demonstrates how to edit attribute values to ensure the dataset reflects the latest and most accurate information. By changing attributes directly in the table, it allows making a quick correction such as building names, categories or any other details. This strengthens the quality of the dataset and ensures that each data has the correct descriptive information.

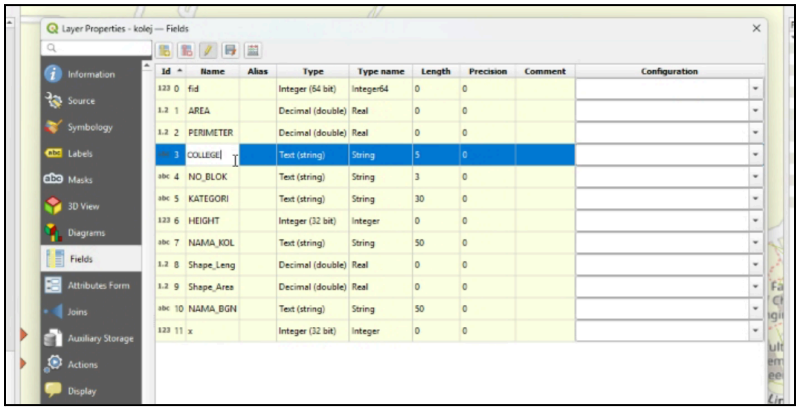
2.2. Spatial Data Editing

Step 1: In the Layers panel, right click on the *kolej* layer and select Properties.

Step 2: Double click on any cell to update the value.



Step 3: The updated value is saved in the table.



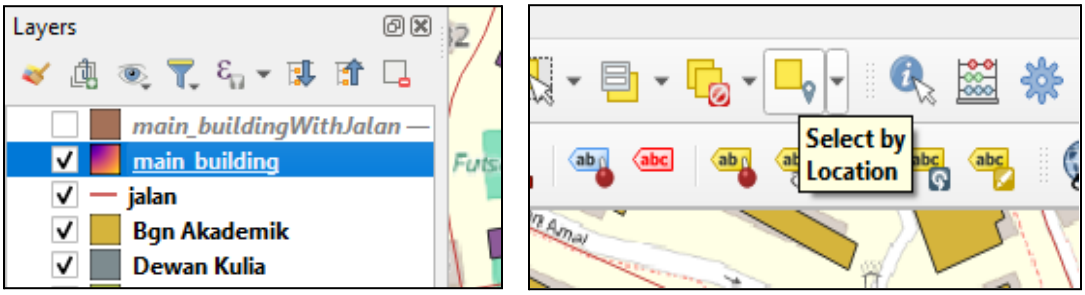
Discussion

This step demonstrates how spatial features can be adjusted to fix inaccurate geometry such as refine boundaries and correcting names. This provides better alignment with the actual layout on the map. Overall, this process enhances the precision and reliability of the spatial dataset.

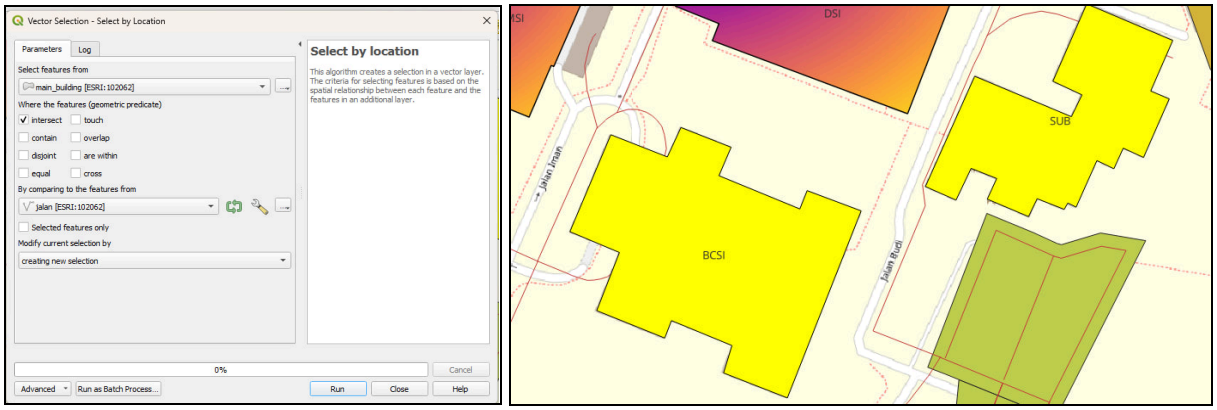
3.0 Spatial and Attribute Query

3.1. Spatial Query

Step 1: In the Layers panel, select *main_building* layer. Then, click on the Select by Location to highlight the target areas.



Step 2: On the Vector Selection, choose the *main_building* for Select feature from, click on the intersect for the features, and choose *jalan* to compare the features from. This is to show the *main_building* that intersects with *jalan* areas. Next, click on the Run and Close to execute the selection.



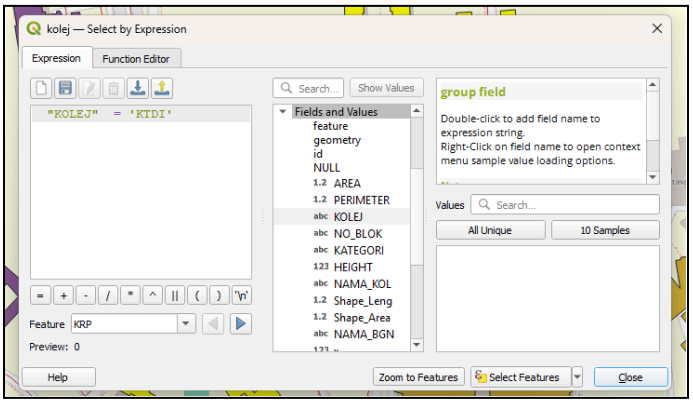
Discussion

This step selects the features based on their spatial location or relationship with other features. It studies the spatial interaction of the items, including whether they touch, overlap, or are near each other. This allows the users to view the map with the spatial connections and patterns being displayed.

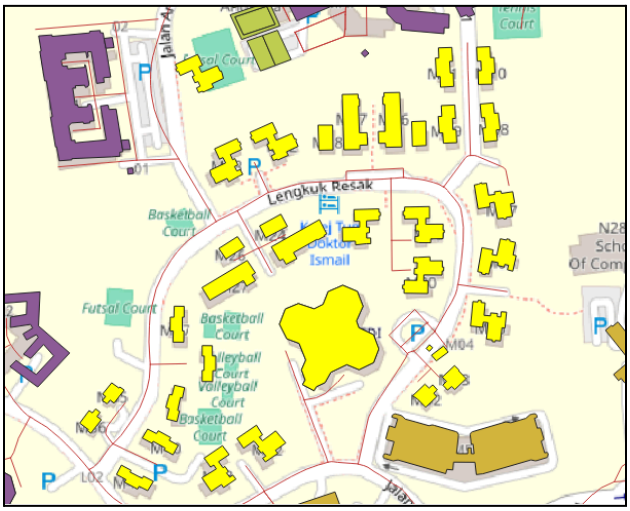
3.2. Attribute Query

Step 1: In the Layer panel, click on the *kolej* layer and click on the Select Features by Expression.

Step 2: On the Fields and Values, select *KOLEJ* and choose '=' expression. Then, type 'KTDI' to choose the KTDI areas. Click on the Zoom to Features and Select Features to highlight the areas.



Step 3: The highlighted areas show the *kolej* selection that has been made.



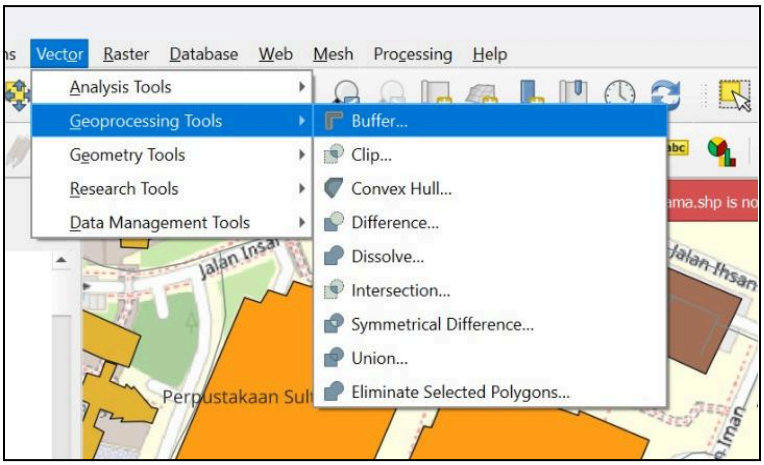
Discussion

In this step, features are selected utilizing information from their attribute table. It uses simple expressions or conditions for filtering the data like picking the items that are in a certain category or have a specified value. This helps in restricting the data set to the features that meet the particular criteria.

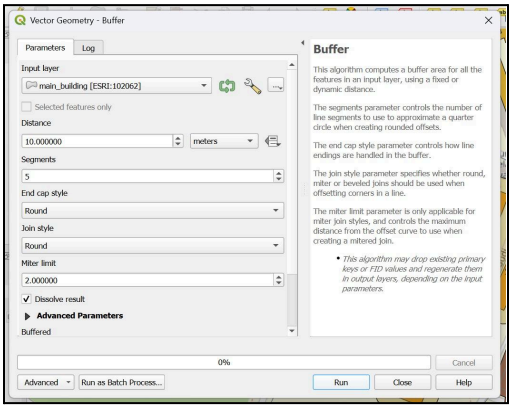
4.0 Example of Buffer, Clip and Merge Analysis

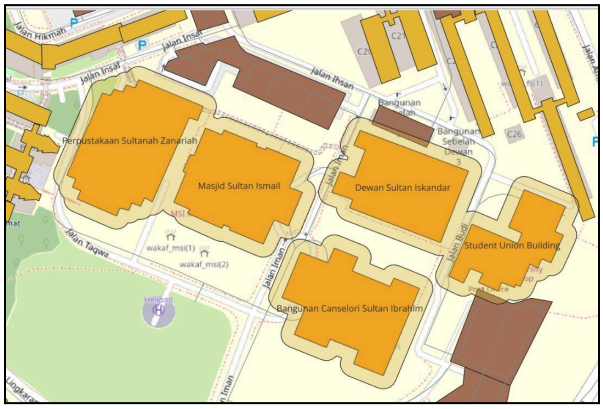
4.1. Buffer Analysis

Step 1: Select vector, click on the Geoprocessing Tools, and click Buffer.



Step 2: Select which input layer we want to buffer, indicate the distance, segments, and click on the Dissolve result and Run. In this example, we choose to do a buffer on the main_building layer.



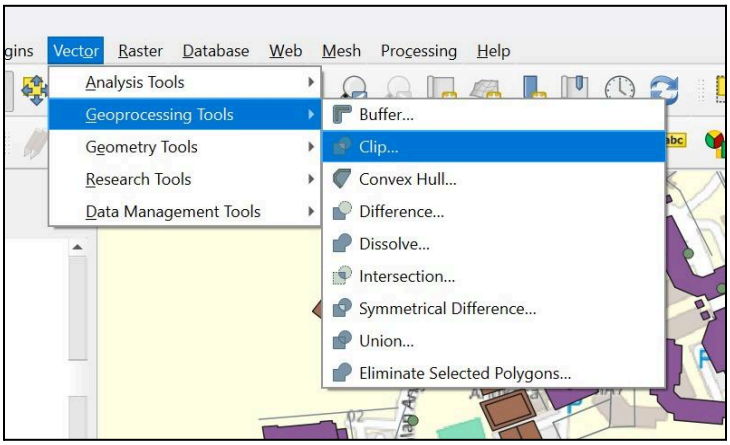


Discussion

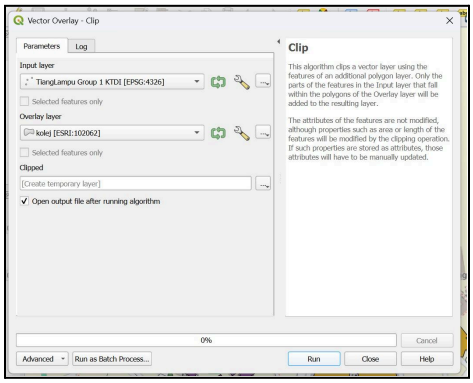
By using buffer tools, we can create a zone (an area) around geographic features at a specific distance. Using our example, we have created a main building area in UTM by declaring a specific distance which is 10.00 meters in transparent yellow colour.

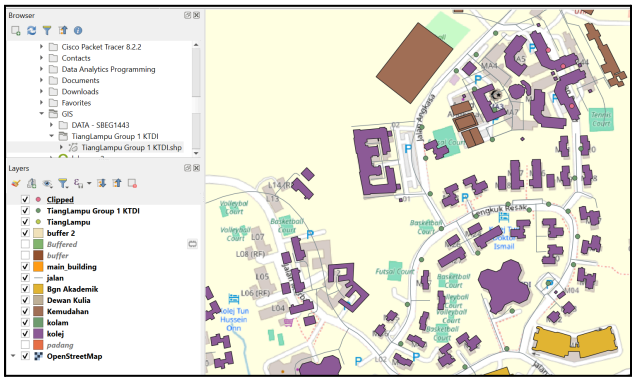
4.2. Clip Analysis

Step 1: Select vector, click on the Geoprocessing Tools, and click Clip.



Step 2: Set the input layer, overlay layer, clipped name and click Run. In our example, we want to clip between the Tiang Lampu KTDI layer with the kolej layer. And then, click Run.



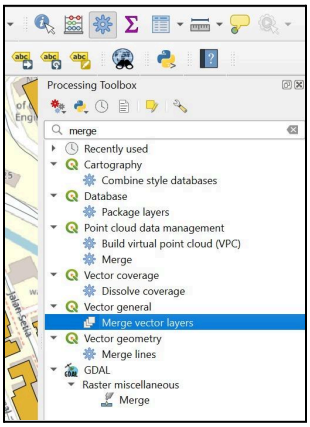


Discussion

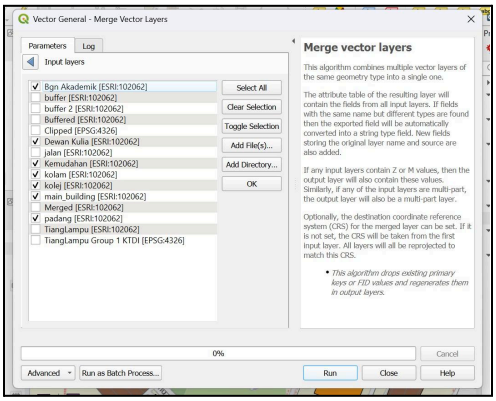
By using these clip tools, it keeps only the part of the input layer that falls within the area of the "clip layer". Using our example, it shows the input layer which is tiang lampu KTDI that falls within the kolej layer with pink colour dots.

4.3. Merge Analysis

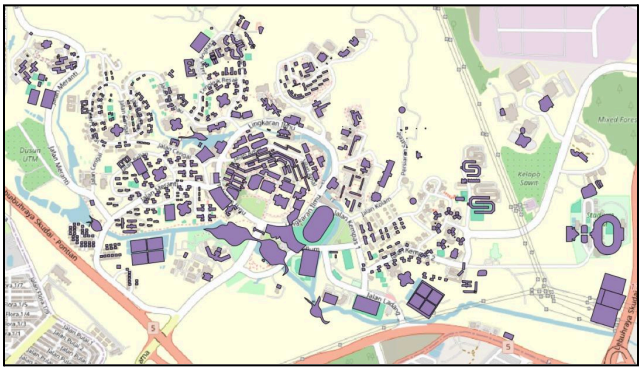
Step 1: Click toolbox, then search merge. Clicked merge vector layers.



Step 2: Select the layer that we want to merge who has the same datatype. In our example, we chose Bgn Akademik, Dewan Kuliah, Kemudahan, kolam, main building, and padang as one layer and click run.



Step 3: Result of the merged layer is in purple colour.



Discussion

By merging these layers, it becomes easier for us to locate UTM buildings and facilities in a single layer instead separately. This is beneficial when we want to widen the map area, as we won't need to insert each layer one by one. We can simply select the merged UTM layer directly.