# Laboratory of Geographic Information Systems

## Basic Geoprocessing in Quantum GIS

Geoprocessing procedures in general operate on spatial features from one, two or more layers (or spatial feature classes) in order to produce a new features class as a result. Because there are many possible geoprocessing operations, in QGIS they have been given their own menu in **Vector -> Geoprocessing tools**.

**TASKS TO BE CARRIED OUT**

The goal of this exercise is to execute the following operations on the given elements of the Tricity geodatabase. The results should be presented in the form of layers on an otherwise empty map.

1. *Buffer*. This operation creates a new spatial feature class (vector polygons, in particular) based on an existing feature class (point, line or polygon). These new features mark a certain distance (usually in meters) around the source data. This is why they resemble the general shape of the original features (for example, if the source features were points, buffering would produce circles around those points).
　　Create a layer on which polygons will represent an area within 100m from the nearest railway (feature class SKKL_L in dataset Sieci drog i kolei; in order to operate strictly on railways, they need to be extracted from this layer. This may be done by selecting all features for which the attribute RODZAJ_P_SZYN has a value equal Poc' by right clicking the layer, selecting **Filter** and saving the result to a new file by selecting **Save as...** from the layer's context menu). 　　　　　1 pt.

2. *Clip* – „clips" features from a chosen class to the area given by a different class.
　　Create a layer containing buildings (feature class BBBD_A in Budowle i urzadzenia) which are located within the 100m buffer. 　　　　　1 pt.

3. *Difference* – creates a new feature class from feature classes A and B in such a way that the result contains all areas from A which are not overlapped by features from B.
　　In this operation we will find all areas in the city of Sopot which are not influenced by railway noise. For this purpose we need the following feature classes:
- ADGM_A in Jednostki podzialu terytorialnego, but limited to the area of the City of Sopot (this can be achieved by filtering the layer contents through the field "NAZWA" with the value 'M.Sopot'),
- a layer which represents an appropriately long distance from the nearest railway line 　　　1 pt.

4. *Dissolve* – merges objects basing on identical values of a given attribute.
　　Create polygons representing administration areas by merging districts (feature class ADGM_A in Jednostki podzialu terytorialnego) by the value of field ID_POWIATU. 　　　　　0.5 pt.

5. *Create a new feature class* – this task involves drawing a new geographical object on the map. This may be achieved by creating a new vector layer through **Layer -> Create Layer -> New Shapefile Layer** of type Polygon and Coordinate Reference System (EPSG) 2180. Next, go to **Plugins -> Manage and Install Plugins** and click the **Installed** section on the panel to your left. From this list select **Open Layers Plugin** and enable it. Load the background map by selecting **Web -> OpenLayers plugin -> Add Bing Aerial layer**. Now, find the PGE Arena stadium and zoom the map to get a good view, click Toggle editing on the newly created layer, and draw a shape of the stadium on the map. Finish the sketch with left-clicking and give the feature an ID (eg. "1"). 　　　　　1 pt.

6. *Union* – add the newly created stadium to the existing building layer 　　　　　0.5 pt.