

### **Task 1)**

The gis\_star\_task\_01.zip folder contains 4 raster images in GeoTIFF format. They represent Sentinel-2 NDVI (Normalized Difference Vegetation Index) data covering the city of Brno, Czechia. The folder also contains Brno boundaries in ESRI Shapefile format.

Your task is to create a new raster image (TIFF) representing an average of all the input rasters. Some images include -999 values, mostly representing clouds. These values should be excluded from the calculation.

Preferably, the processing should be done using Python, but feel free to use GIS software like QGIS or ArcGIS Pro, or any other software that you prefer.

Combine the resulting raster with ancillary data of your choice (for example, from ArcCR500 or OpenStreetMap databases) and prepare a visually appealing map of vegetation in Brno.

The result should contain the averaged GeoTIFF image and a PDF document with the visualization and a short description of the methodology and the utilized tools. If you choose to use Python, please paste the code to <https://pastebin.com/> and add the link to the document.

### **Task 2)**

The gis\_star\_task\_02.zip folder contains 5 raster images in GeoTIFF format. They represent Sentinel-2 EVI (Enhanced Vegetation Index) data covering an agricultural parcel in Southern Bohemia, Czechia. The folder also contains the parcel boundaries in ESRI shapefile format.

Each image is from a different season as you can see from the file names. Pixels outside of the parcel boundaries have no valid data and their values are equal to -998.

Your task is to create a new raster image (GeoTIFF) representing the average variability of the parcel between the 5 seasons. Divide the parcel into 5 different classes (zones) and label the classes 1, 2, 3, 4, and 5. The classes should go from lowest (class 1) to highest (class 5) vegetation quality.

We suggest you first reclassify each raster image and then create an average from the 5 reclassified images. After averaging them together, round the values so that you get just the 5 classes. The resulting raster image should therefore contain values 1-5 plus -998 for no data.

There are many reclassification (zonation) methods that you can use, for example, thresholding or clustering.

Visualize the result(s) in a map.

Preferably, the processing should be done using Python, but feel free to use GIS software like QGIS or ArcGIS Pro, or any other software that you prefer.

The result should contain the reclassified TIFF image and a PDF document with the visualization and a short description of the methodology and the utilized tools. If you choose to use Python, please paste the code to <https://pastebin.com/> and add the link to the document.