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FACTOQGIS: A GUI TOOL BASED ON AN R SCRIPT TO PERFORM GEOMETRIC DATA ANALYSIS IN A FREE AND OPEN SOURCE GIS

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FactoQGIS is an algorithm that allows the implementation of a geometric analysis of multidimensional data in QGIS. More specifically, this tool was designed to easily perform a typological analysis on quantitative data aggregated in spatial units. This method is broadly used in geography but it was up to now executed out of GIS environments, in specific statistical software. FactoQGIS is a tool which precisely fills this gap among GIS functionalities. It first performs a PCA (Principal Component Analysis) and second a HAC (Hierarchical Ascending Classification) on the first factors. FactoQGIS is based on an R script that mainly uses the FactoMineR package developed by François Husson et al. (Agrocampus Ouest, Rennes, France). The results (tables and plots) are exported respectively in Excel and png format and then inserted into an html file that automatically pops up in a web browser at the end of the process. The algorithm also creates a new layer with a column indicating the cluster each spatial unit belongs to, so as to make it easy to map the typology. FactoQGIS is accessible from a graphical user interface directly in the QGIS environment. It will be of particular interest to geographers and to any users who wish to simply build and map a multidimensional typology without knowing the R language. To illustrate how FactoQGIS works, we performed as an example, a typological analysis on socio-demographic data that are aggregated by "arrondissements" and "communes" in Paris.

Keywords: Geometric Data Analysis; Typological Analysis; Aggregated data in spatial units; R script; Free and Open Source GIS