Supplementary Material – C: Data Processing and Visualization Tools

In the methodology employed to analyze the city of Bucharest with regards to accessibility and services, several analytical techniques were implemented using Python, this by making use of libraries such as *<<pandas>>, <<geopandas>>, <<matplotlib>>,* and *<<seaborn>>*.

OSMnx is described as being Python package that allows the download of OpenStreetMap street network data (Boeing, 2017), automatically correcting and simplifying network topology to accurately represent crossroads and dead-ends, also providing tools to compute the shortest paths between geographical locations and various network measures, such as the intersection density, centrality metrics, and urban design indicators, measures that are highly relevant to transportation and statistical physics (Ewing and Cervero, 2010; Giacomin and Levinson, 2015). Developed in order to facilitate working with geospatial data, GeoPandas is a Python library that comes as an extension of the pandas library, this by extending its capabilities. (Jiang et al., 2024; Rojas et al., 2023). By allowing its users to handle and analyze data specific to geometries, such as points, lines and polygons, this library is essential in analyses about geographical matters. More than this, GeoPandas supports operations such as spatial joins, buffering, and intersecting, operations that are essential for properly computing geographic information (Rojas et al., 2023). With regards to this study, GeoPandas was used alongside OSMnx to manage, visualize, and analyze spatial data for Bucharest's districts.

Matplotlib, one of most commonly used Python libraries, is a significant actor in regard to matters that are related to data visualization or generating customized maps. Together with the GeoPandas library, Matplotlib eases the visual analysis of differences across districts by enabling the overlay of accessibility data on maps. More than this, as Seaborn extends Matplotlib’s library capabilities, it is able to not only simplify the creation of advanced statistical plots, but also to provide themes that are more visually pleasant (Han and Kwak, 2023).