Course name: Challenge by Polito_ Stellantis

Project name: Designing Sustainable Mobility for Changing Urban Landscapes

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Introduction:

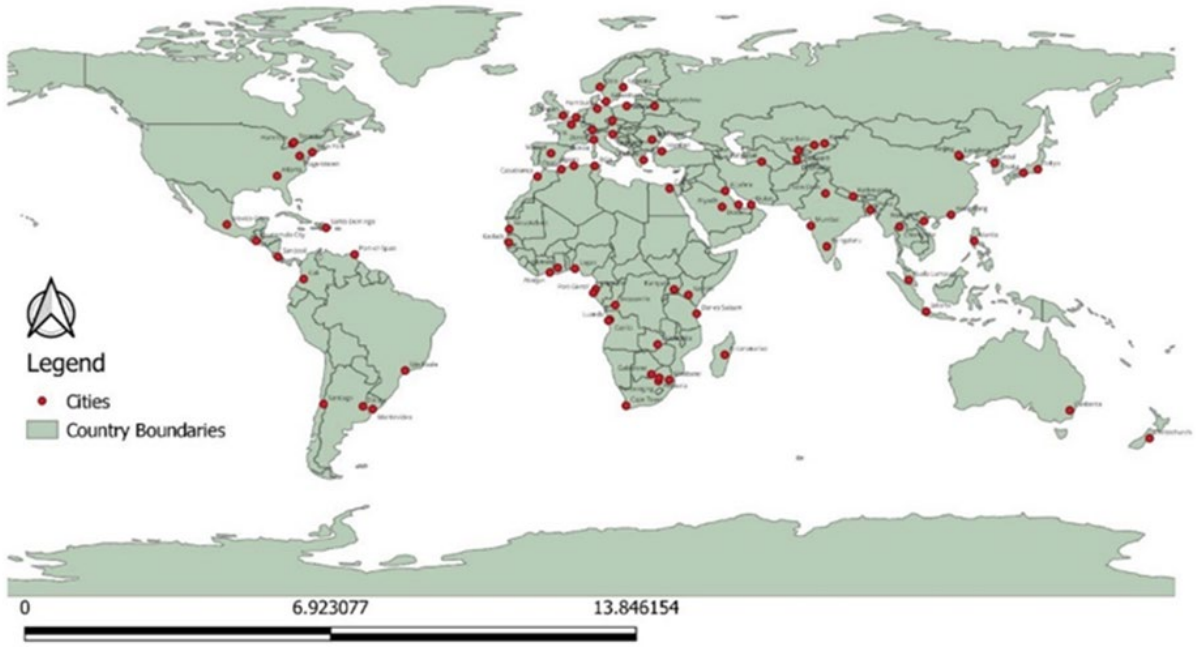
The overall aim of the project is to understand shifting mobility behaviour in cities. To achieve this, each city should be examined separately since every city is different from another. Since this task is practically impossible, archetypes were created that identify each city type in the world.

This project can be separated into two main sections: City selection process and Clustering along with archetype formation. In the first part a process similar to a function has been implemented to select worldwide cities. Multiple parameters have been used to ensure both diversity of the sample pool as well as selecting cities that are more significant compared to others and can be used more easily as benchmark for other cities around the world.

In the second section, data for relevant indicators regarding the selected cities were found, and using standard clustering methodologies, the 80 cities were categorized into different clusters, which are the archetypes. Later in this part, the characteristics of each archetype were examined and a representative which embodies the aspects of that archetype was selected from each of the clusters.

City Sampling:

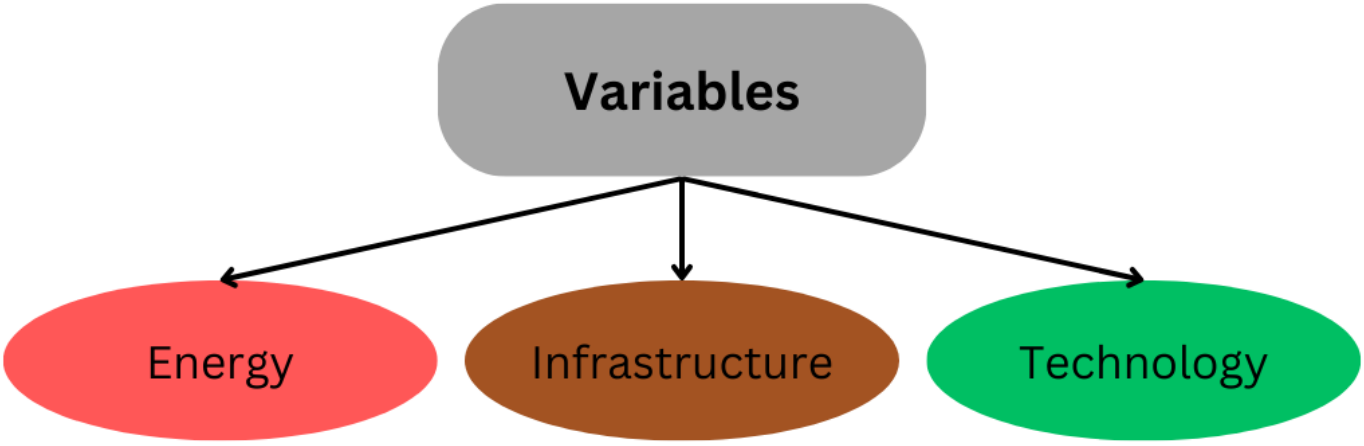
80 cities were selected based on number of urban centers in continents, countries political stability, population, urbanization rate, Human Development Index (HDI), and GDP.



Selected cities on the map.

Variables:

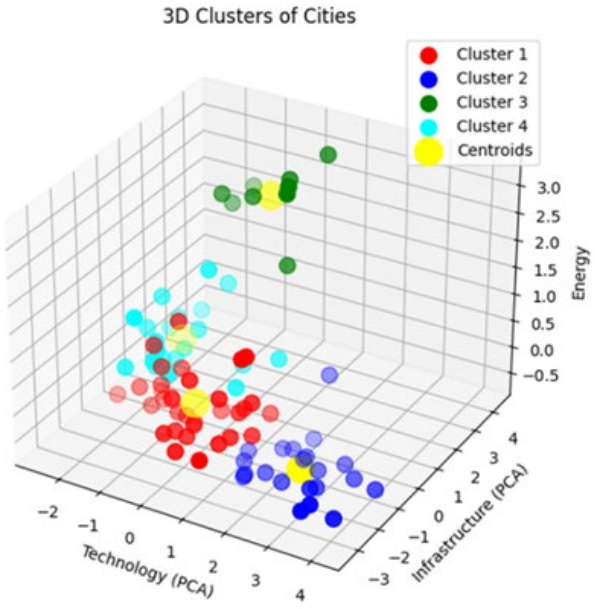
In order to form archetypes, variables should be introduced for clustering. After extensive research, 13 variables were selected and categorized into 3 groups. The most important aspect of these selected variables was their availability.



Main group of variables.

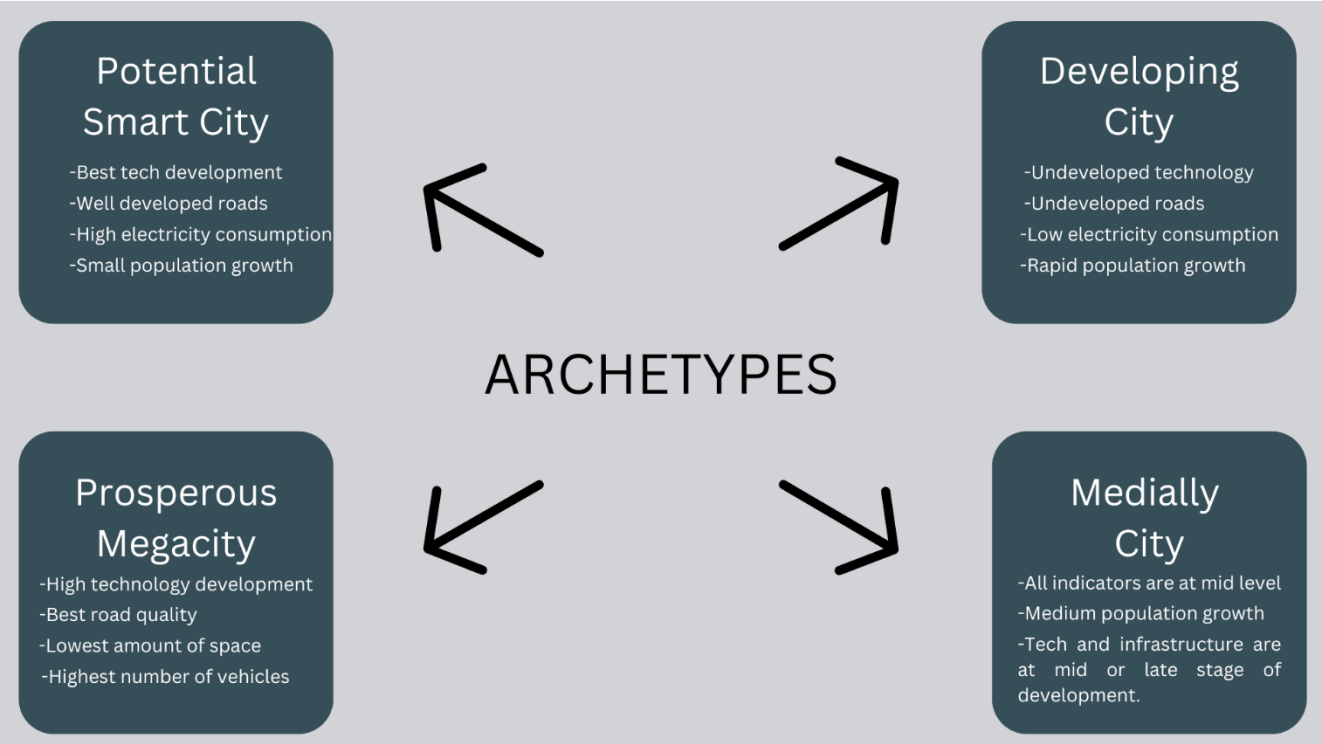
Clustering Result:

Clustering was done in Python. It consisted of multiple steps. The final result of clustering showed 4 clusters, meaning that there are 4 city archetypes.



3D visualization of clusters.

City Archetypes:



City archetypes and their general characteristics.