**Ecuador's top Cities and their Parish Segmentation Characteristics**

Xavier Jácome Piñeiros

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## 1. Introduction

### 1.1. Background

Ecuador is a small country located in South America. According to the Ecuadorian national statistics institute named "Instituto Nacional de Estadísticas y Censos", INEC, the country has around of 17 million of habitants. The Ecuadorian constitution of 2008 stablished the country as a constitutional republic which political-administrative division comprises from highest to lowest hierarchy, 24 provinces, 221 cantons and 1500 parishes. The most important cities of Ecuador are Quito and Guayaquil. Quito is the political capital and Guayaquil is the main port city of the nation.

The parish is the lowest political-territorial division in Ecuador. There are two types of parishes: urban and rural. The urban parish is one that is circumscribed within the metropolis or city. It consists of the entire necessary infrastructure to be a main city. The rural parish are those that are separated from the main city or metropolis. The capital city, Quito, it is divided into 70 parishes. In the other hand, the main port city, Guayaquil, it is divided into 24 parishes.

In the economical field, the World Bank data shows that Ecuador produced a GDP of 108.398 Billion dollar in 2018. Quito and Guayaquil contribute largely to the total amount of the GDP of the country. In line with this, El Comercio, a much known newspaper in Ecuador, cited in an article that Guayaquil is the main city that contribute to the total GDP of the country followed by Quito. This information shows that Quito and Guayaquil are not only the most important cities of Ecuador due to the political-administrative division of the country, but also for the largely contribution of them to the GDP of the nation.

### 1.2. Problem

The national statistics institution and other public institutions have different type of data sources that are recollected and prepared for generating some limited analysis. Nevertheless, despite of having information of the parishes and the venues of each parish, there is no analysis related to know how similar or dissimilar parishes due to the common venues people visit are. This type of analysis is important for different type of audiences like companies that want to know where to locate new stores and for public authorities that want to coordinate cities development.

### 1.3. Objective

The main objective of the project is to determine how the parishes of Quito and Guayaquil cities are grouped because of the venues type people visit in each parish area.

To achieve the main objective of the project, it is necessary to fulfill with these two specific objectives:

- Determine the type of common venues that are present in the radius area of each parish.
- Segment the parishes due to the type of common venues people visit in each parish.

## 2. Data acquisition and cleaning
## 2.1. Data sources

To achieve the objectives of the project, two different data sources were used. The first data source was a website (URL: www.codigopostalecuador.com/guayaquil-876) which has information about the latitude and longitude of the cities and parishes of Ecuador. In this website, it is also available the postal code of each political-administrative division of the country. This first data source was very important to the project due to locate the venues that are in the area of each parish.

The second data source was the Foursquare database. It allows developers to obtain information in which using its API empowers users to explore millions of points-of-interests by powering rich location data features like venue search. With Foursquare API, it is possible to know the type of venues located in the radius of the geographical coordinates of a parish. This kind of data was necessary to complete both of the specific objectives of the project. The version of the API used in the project was 20180605.