Predicting Investment Options with Capital Optimization in Quito City

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1. Introduction

1.1. Background

Worldwide pandemics caused by SARS-CoV-2, more widely known as Coronavirus or Covid-19, has caused a dramatic impact at all levels, becoming a major threat to people's health, and causing millions to stay quarantined as, *in time*, it was the official recommendation from the World Health Organization (amongst others). Unfortunately, and as a side consequence, global economics was heavily impacted for the sudden stop in the daily commercial *peer to peer* activities, while other businesses (mostly internet based) flourished as a result of the same cause. This hit to economics was even worse in developing countries, which are usually less prone to have contingency plans for these scenarios, having to improvise "on the go" on an already poor economic system. One of these countries is Ecuador, which according to the website of the Human Development Reports by the United Nations, is placed at the 85th rank; additionally and according to the Ecuadorian Ministry of Labor, 67.9% of the work places are considered to be "informal" which groups both freelance or familiar *peer to peer* projects, and street sales of several categories of products (both of which do not have any kind of contract or assured economic income, but rely entirely on their sales). Speaking of the freelance projects, the investors are very meticulous when deciding what to invest in, as the usually end up tied to that investment for long periods of time, and usually rely on *gossip of what's popular at the moment to decide the investment field*, rather than an actual market study. Knowing which are the current popular offers in some town as well as if that town is similar to the one currently living, would increase dramatically the odds of success in the investment process.

1.2. Problem

The data to approach this problem, involves a knowledge of the current venues in Quito city towns, as well as crime rates and cost of sale (or rental) per square meter. The principle is simple: investors usually look for towns that are cheap, with a low crime rate, and as similar as their home town. These aspects are to be kept in mind in the research to come.

1.3. Interest

Small investors will be very interested in the outcome of this project, as this could help them to choose a location near to them to start their new businesses, as well as several options for them so they don't "overlap" in their decision.

2. Data Acquisition and Cleaning

2.1. Data sources

For venues search, Foursquare API will be used, which usually returns venues and / or reviewers data based on the geographical coordinates. For the coordinates as well as the towns in Quito, I scrapped form this website, and converted it into a data frame; we will make a brief check to make sure to delete all of the towns not belonging to Quito city. Regarding crime and rental prices, this website was checked, however unfortunately it is dated back to 2010 (last nationwide census year), and thus it might provide a false appraisal of current (2020) market, so these parameters will be discarded for further analysis.

2.2. Data cleaning

After the scrapping process, the town rows not belonging to Quito (manual check) were discarded. Then the data frame is very much ready to the next stage of analysis.