Tourism in Chile and Peru post COVID-19: clustering touristic neighborhoods for boosting countries' economies

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1. Introduction / Business Problem
1.1 Discussion of the Background

Latin America is one of the most famous and visited regions worldwide, by millions of tourists from the continent and around the globe. According to the prestigious worldwide Market Research Agency *'Euromonitor International'* on its report *'Top 100 City Destinations 2018'*, there are seven Latin American cities among the 100 most visited cities around the world in 2017 [1]. The cities, in descending order based on their number of visitors, are:

- **Cancun, Mexico (35th place).**
- **Punta Cana, Dominican Republic (58th place).**
- **Mexico City, Mexico (88th place).**
- **Buenos Aires, Argentina (89th place).**
- **Lima, Peru (91th place).**
- **Santiago de Chile, Chile (93th place).**
- **Rio de Janeiro, Brazil (94th place).**

In consequence, as shown in the 2020 '*Economic Impact Reports'* from the **'World Travel & Tourism Council'**, local and foreign tourists report millions, and even billions of US dollars (in Argentina, Brazil and Mexico) [2], to each of the mentioned countries in the previous list. Therefore, the Travel and Tourism industry is key for the economic development of these Latin American countries; its impact shown **as a percentage of the total GDP [2] (Gross Domestic Product) [3] by country** is the following:

- **Argentina: 9.2% of total GDP** (+0.2%, *2019 Travel & Tourism GDP Growth*).
- **Brazil: 7.7% of total GDP** (+3.0%, *2019 Travel & Tourism GDP Growth*).
- **Chile: 10.0% of total GDP** (+0.3%, *2019 Travel & Tourism GDP Growth*).

- **Dominican Republic: 16.3% of total GDP** (+2.0%, *2019 Travel & Tourism GDP Growth*).
- **Mexico: 15.5% of total GDP** (+2.0%, *2019 Travel & Tourism GDP Growth*).
- **Peru: 9.3% of total GDP** (+2.9%, *2019 Travel & Tourism GDP Growth*).

1.2 Description of the Business Problem

As it is well known by everybody, COVID-19 has become one of the worst pandemics of the last 100 years, with **more than 23 million confirmed cases and over 800.000 confirmed deaths worldwide** [4]. The novel COVID-19 virus not only has taken innocent lives, it has also caused the worst economic crisis since the *Great Depression in 1929* [5]. The ***World Tourism Organization (UNWTO)*** point that international tourism, between January and May 2020, has suffered a fall of *"… **300 million tourists and US$320 billion lost in international tourism receipts** – more than three times the loss during the Global Economic Crisis of 2009"* [6].

Latin America has become one of the most affected regions worldwide during the pandemic. As of August 24th, there are **more than 6.7 million confirmed cases, 259.065 confirmed deaths** and several countries are battling major outbreaks [7]. Thus, in each country all the productive and service sectors have been affected in their incomes. According to the UN Economic Commission for Latin America and the Caribbean, COVID-19 pandemic "… **may cause total GDP in the Caribbean and Latin America to fall by 8 percentage points and 1 percentage point**, respectively" [8]. This percentage, seemingly insignificant, would cause every country loss thousands of millions of US dollars, thus deepening the economic crisis that the Latin American countries will face in the upcoming years.

Once the COVID-19 is over, it will be key for Latin American countries to boost their tourism countrywide to help recover their economies as soon as possible. From this background, and for the sake of simplicity, it is formulated as the first problem to solve, the **clustering (*using k-Means Machine Learning algorithm*) of the different neighborhoods only from Lima (Peru) and Santiago de Chile (Chile), to find which are the most touristic ones. Hence, it will help the local and international touristic agencies to promote tourism in those areas** to increase the flow of visitors, and with it, the money that this economic item reports both to Chile and Peru.

And as a second problem to tackle, we **will use the same k-Means clustering algorithm to group these touristic neighborhoods between Lima and Santiago de Chile**, with the objective of **finding similar (or dissimilar) touristic neighborhoods between the mentioned cities.** This valuable information **could help Peruvian and Chilean touristic agencies, for example, to create alliances or a collaborative network between each other and create touristic packages across these cities to support tourism between different countries**, attract more Latin American tourists and other ones from other continents such as Africa, Asia or Europe; in addition to increase the tourism profits and the percentage of GDP that tourism contributes to each country.

Later, in a future study, this analysis would be deepened by adding more Latin American cities to analyze. This more detailed study **could even help the local governments adopting cooperation policies to promote cooperative tourism plans and boost this item in Latin America, recover faster their economy and the GDP percentage that tourism contributes to each Latin American country.**

In these problems, we will only **analyze Lima and Santiago de Chile metropolitan areas, according to its definition and a population density of at least 1.000 inhabitants per square mile [9], which are among the 100 most visited in the world**. This decision was taken because smaller cities such as Cancun and Punta Cana are much smaller and have fewer neighborhoods, which are mainly defined in advance as touristic sectors, since tourism is their main source of incomes. And also, because this project seeks to carry out a pilot study of analysis and measurements for cooperative tourism in Latin America (starting with Chile and Peru), which is suggested to deepen in a second study.

1.3 Stakeholders interested in the Project

The potential stakeholders that this Data Science project contemplates are the following:

I. Chilean and Peruvian touristic agencies which are interested in improving their touristic packages post COVID-19 pandemic to capture more tourists around the world, with the objective of increasing the number of visitors in their countries and the revenues perceived by the tourism. The project **also contemplates touristic agencies of both countries interested in cooperating between each other and promote greater packages that can boost in a broader and more cooperative way the tourism in this region,** always with the focus in increasing the visits and GDP percentage that tourism contributes to each country.

II. Governments and their Tourism Ministries from Chile and Peru which are **interested in adopting collaborative policies to boost faster and more effectively the tourism in their countries, under a post COVID-19 pandemic context, to contribute for a faster economical recovering for their countries and subregion**: more local/foreign tourists and an important increase in Tourism & Travel revenues that goes to each State coffers.

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