**A. Introduction**

**A.1. Description & Discussion of the Background**

Imagine that you have decided to change your country to where you have never been. The first thing, you probably think about is where to resident. The answer, always, comes from top to bottom of choice pyramid: you choose your country, then city, neighborhood, and so on. In each step you have some points to consider. We name them «constraints».

As an immigrant who came to Canada a decades ago, with the assumption that «Canada is cold», my first thing to be worry about was the temperature; as many other immigrants. We explore different websites for long hours to compare weather from west to east of country. Never could find an accurate estimation about subject.

The subject of weather is more essential for a business organization who sales different category of items related to cold weather of Canada, such an organization needs to know which item is more probable to be sold in each cities. (Like clothing)

Both groups need to answer to this question: Is it possible to define some zones with the same weather condition, and then assign each of cities to one of these defined zones? So we could easily find out what does like the weather of special city by checking just the zone which it is a part of.

In this project:

* Phase I: we are trying to cluster a limited list of cities of Canada.
* Phase II: we will find out if we could assign a new unknown city to a climatic zone just by having its geographic coordinates.
* Phase III: as our objective is an estimation of life comfort accessories in each city, we are going to add an indicator of service accessibility. For example number of coffee or restaurant could reflect job and service accessibility like hospitals, hotels, governmental services, schools etc. of course we could use directly all of mentioned area instead of indicator if the objective was a profound analyze.

**A.2. Data Description**

The data, used in this project, comes from four tables of two sites. The tables are easily accessible; however, the registered data in these tables need a considerable manipulation.

* The weather information comes from three tables in «Wikipedia» [1].
  + First Table contains the weather information related to «average temperature» for two months of January and July, respectively, as representative of cold and hot months.
  + Second table covers the weather information related to « Heat, cold and frost averages »
  + Finally, the third table shows the weather information related to «extreme temperature» for two months of January and July, respectively, as representative of cold and hot months.
* And for last table, the list and the coordinate of Canadian cities are extracted from «SimpleMaps» [2].
* Also, we will use «FourSquare» as our sources for venues. We will use the coordinate of cities in last table to find our indicator venue occurrence around a fix radius of 250 m for all cities. [3]

**References:**

* [1] [***https://en.wikipedia.org/wiki/Temperature\_in\_Canada***](https://en.wikipedia.org/wiki/Temperature_in_Canada)
* [2] [***https://simplemaps.com/data/canada-cities***](https://simplemaps.com/data/canada-cities)
* [3] ***https://foursquare.com/***