

# Introduction

## Background

Luxembourg is a small European country located between France, Belgium, and Germany. With an area of 2,586km<sup>2</sup> it is the seventh smallest country in Europe, and its population of 628,381 makes it the eighth least populous country in Europe [1]. 91.5% of the population lives in urban areas.

There are twelve legally recognised towns in Luxembourg; Diekirch, Differdange, Dudelange, Echternach, Esch-sur-Alzette, Ettelbruck, Grevenmacher, Luxembourg City, Remich, Rumelange, Vianden, and Wiltz. Luxembourg City is the largest town with a population over 100,000, however the small size of the country means that the remaining towns do not have the qualities needed to be regarded as cities in the international usage of the word.

## Problem

The small nature of the towns means that they are difficult to compare to settlements in other European countries, as well as to each other. This project attempts to compare the towns of Luxembourg and use this to build a recommender system that finds the most similar town to any town in Luxembourg.

## Interest

This project would be of interest for the people of Luxembourg, and particularly the government of Luxembourg who will want to understand the current state of towns in Luxembourg as well as their similarities and differences. This project may also be of interest to people looking to emigrate to Luxembourg and are looking for the most similar town to their current place of residence.

## Data

### Data Sources

Wikipedia has been used to scrape basic data on each town such as name, region, population, area, latitude, and longitude [2].

The Foursquare API has been used to obtain data on places and businesses within each town [3]. These places can be found by looking for places within the vicinity of the latitude and longitude data scraped from Wikipedia. Data obtained on each place includes name, latitude, longitude, address, neighbourhood, and type of establishment.

Weather data was considered for use in this project however there are only three weather stations in Luxembourg as suggested by The Weather Underground [4]. This meant that differences in weather between many of the towns were negligible, and would not be useful in the recommender system.

## References

- [1] <https://www.cia.gov/library/publications/the-world-factbook/geos/lu.html> (Accessed at 2020/04/29)
- [2] [https://en.wikipedia.org/wiki/List\\_of\\_towns\\_in\\_Luxembourg](https://en.wikipedia.org/wiki/List_of_towns_in_Luxembourg) (Accessed at 2020/04/28)
- [3] <https://developer.foursquare.com/docs/places-api/> (Accessed at 2020/04/28)
- [4] <https://www.wunderground.com/> (Accessed at 2020/04/29)