

## **Introduction / Business Problem**

A businessman wants to open a new coffee shop within London. There are already a lot of coffee shops so the businessman wants to analyse which areas are underrepresented and have the lowest proportion of coffee shops.

People in London mainly travel using the tube, so the businessman wants to analyse coffee shops based on their proximity to each tube and discover in which area the biggest opportunity lies.

The population density within a 1km radius of each tube station is unknown and we won't factor that into this analysis. Instead, we will analyse the proportion of coffee shops in relation to other venues and this should give us a figure that can be compared between all tube stations without needing a 3<sup>rd</sup> data source.

The businessman wants to focus on Central London so we will use the zone variable to limit the train stations to zones 1 to 3.

## **Data**

Geographical data about each of the tube stations in London and their latitude and longitude will be downloaded:

[https://commons.wikimedia.org/wiki/London\\_Underground\\_geographic\\_maps/Tables](https://commons.wikimedia.org/wiki/London_Underground_geographic_maps/Tables)

This consists of the values "station name", "latitude", "longitude", "zone"

Eg: Acton Town, 51.5028, -0.2801

There are 10 zones on the London Underground but we will focus on areas close to Central London, so the stations will be filtered to be between zones 1 and 3.

The Foursquare API will be used to analyse the proportion of coffee shops within a 1km radius of each tube station.

The venues/explore API will be used for the latitude and longitude of each tube station for venues within 1000m. The venue category data will be used to calculate the saturation of coffee shops within a short distance to each tube.

This table can then be used to show the tubes which have the lowest density of coffee shops in proximity, then a k-means cluster analysis can be carried out to find similar stations based on the whole range of venue category types.