**Introduction / Business Problem**

Prior to the COVID-19 outbreak, there was a surge in demand for fitness activities and gyms in Singapore. According to [Statista,](https://www.statista.com/outlook/dmo/eservices/fitness/singapore) total revenue from Singapore’s fitness industry was projected to reach US$ 29 million by the end of this year, and gym attendances have seen a 4.82% compound annual growth rate between 2011 and 2019.

With the proliferation of both indoor and outdoor gyms, fitness centres and programs nationwide, the local fitness market has become crowded in recent years. New entrants that rely on physical space should pick their locations carefully so as to avoid competition with established players, but yet take advantage of local consumer preferences like off-work gym sessions and mid-day workouts among working urbanites.

This project aims to determine which clusters are best for setting up a new gym or fitness centre by assessing the concentration of such venues within particular districts.

**Data**

Beyond the Foursquare API, data used in this project include the table of Singapore’s planning areas from this [Wikipedia page.](https://en.wikipedia.org/wiki/Planning_Areas_of_Singapore) Additionally, geolocational data gathered from geocoder will also be used in the project.

**Methodology**

This project starts with exploratory data analysis. This phase begins with the scraping of data from the table of planning areas in Singapore, identifying how many districts there are, and then eliminating irrelevant districts from the analysis.

Next, geocoder is used to obtain the latitudes and longitudes of all districts in Singapore. This data is then merged with the initial data such that the merged dataset contains the district name, latitude and longitude of the district.

Using geocoder again, we then obtain the coordinates of Singapore, and create a cluster map of Singapore by setting the number of clusters to equal the number of labels. At this juncture, the cluster map essentially shows where all districts in Singapore are located.

Then, using the Foursquare API, we obtain the top 100 venues in Singapore within a 2000-metre radius. From this, we then create another dataframe containing only gym / fitness centre data. This new dataframe is then sorted in descending order of frequency of occurrence of gyms / fitness centres in that district.

**Results**

From the analysis, it is clear that most gyms and fitness centres in Singapore are located in the West and Downtown areas of Singapore. There is a complete absence of gyms in Singapore’s North and Northeast – ideal locations for anyone looking to set up a new gym or fitness centre. Naturally, other factors such as footfall and rent also come into play. But based on concentration of gyms and fitness centres alone, these areas are optimal for new entrants given the relative lack of competition.