Data Acquisition and Preparation:

Data 1:

Toronto

Toronto city data is used. Its location of the downtown area is used. The foursquare API is used to fetch the location data of Toronto downtown and then the same API is used to fetch the nearby venues of the Toronto downtown.

Data 2:

New York City

The second data that is used for the analysis is about New York city. Its location of the downtown area is used. Again foursquare API is used to fetch the location data of New York city downtown and then the same API is used to fetch the nearby venues of the New York city downtown.

Data 3:

London City, United Kingdom

The third data that is used for the analysis is about London city which is the financial capital of United Kingdom. Again its location of the downtown area is used. The foursquare API is used to fetch its location data of latitude and longitude and then the same API is used to fetch the nearby venues of the London city downtown.

Data Acquisition:

To acquire data on venues and their categories, Foursquare API is used. Foursquare is one of the world largest sources of location and venue data. To retrieve the venues and their categories in a given neighborhood, the coordinates—the latitude and the longitude—of the neighborhood are sent in the API request. The API-request URL looks like the following:

```
https://api.foursquare.com/v2/venues/search?
&client_id=1234&client_secret=1234&v=20180605&ll=40.89470517661,-
73.84720052054902&radius=500&limit=100
```

where search indicates the API endpoint used, client_id and client_secret are credentials used to access the API service and are obtained when registering a Foursquare developer account, v indicates the API version to use, ll indicates the latitude and longitude of the desired location, radius is the maximum distance in meters between the specified location and the retrieved venues, and limit is used to limit the number of returned results if necessary.

The result of this data-acquisition-and-preparation stage is a table (dataframes) that specify the venues of each of the major cities. Below is a part of the Toronto venues table, which is extracted using the foursquare API.

	name	categories	lat	lng	distance
0	Downtown Toronto	Neighborhood	43.653232	-79.385296	113
1	Nathan Phillips Square	Plaza	43.65227	-79.383516	138
2	Indigo	Bookstore	43.653515	-79.380696	260
3	Chatime ????	Bubble Tea Shop	43.655542	-79.384684	237
4	Textile Museum of Canada	Art Museum	43.654396	-79.3865	230
5	LUSH	Cosmetics Shop	43.653557	-79.3804	284
6	UNIQLO ????	Clothing Store	43.65591	-79.380641	378
7	CF Toronto Eaton Centre	Shopping Mall	43.65454	-79.380677	287
8	Ed Mirvish Theatre	Theater	43.655102	-79.379768	380
9	Four Seasons Centre for the Performing Arts	Concert Hall	43.650592	-79.385806	355
10	Japango	Sushi Restaurant	43.655268	-79.385165	222
11	Elgin And Winter Garden Theatres	Theater	43.653394	-79.378507	437

Once this data is acquired, then the data in this dataframe is further modified, aggregated and grouped to find out the required answers for the business case.

The attached project report explains all the results and the conclusions.