Fine Dining in Bristol

Introduction/Business Problem

Bristol, UK, is a bustling city with a huge variety of inhabitants from different cultures and backgrounds, and with very different incomes. This project aims to guide a high-end restaurant owner in their search for a prime location for their new restaurant, based on the number and type of food outlets and high-end stores in the surrounding area and the most common venues. The prime locations for the new restaurant will be given as the locations where high-end stores (e.g. jewellery stores, department stores etc) are common and avoiding locations where a large number of restaurants already exist. This is to make sure that the restaurant is positioned in an area that high-income customers frequent and that there is little competition from other restaurants in the area.

Data

Sources

This project makes use of postcode areas in Bristol, given in https://en.wikipedia.org/wiki/BS_postcode_area, in order to divide Bristol city into districts. The geocoder module in Python is used to obtain location data for these districts. Foursquare is used to obtain a list of venues and trending venues in each district. Districts containing a large proportion of high-end stores (e.g. jewellery stores), ideally trending, and a low proportion of food outlets will be recommended as prime locations for the new restaurant. Areas containing a lot of venues associated with low income or industry (e.g. distribution centres, fast-food restaurants) will be excluded from the list of recommended locations for a high-end restaurant.

Acquisition and Cleaning

The *.read_html* function from the Pandas package is used to import the postcode and district data from https://en.wikipedia.org/wiki/BS_postcode_area as a Pandas dataframe. This dataframe has four columns: Post town, Postcode district, Coverage and Local authority area. First, postcodes with no coverage are removed and the dataframe is sliced such that only districts with Bristol as the post town are included. Redundant columns are removed from the dataframe; Post town is Bristol for every row and so adds no additional information to the sliced dataset, and the Local authority area is not relevant to the problem at hand. Finally, the dataframe index is reset, leaving a clean dataframe. Finally, the geocoder.arcgis function was implemented to locate the centre of each postal district in Bristol, in terms of latitude and longitude. Columns latitude and longitude were then added to the dataframe, as shown in Figure 1.

	Postcode district	Coverage	Latitude	Longitude
0	BS1	Bristol city centre, Redcliffe	51.453845	-2.594374
1	BS2	Kingsdown, St Paul's, St Phillip's, St Agnes	51.450367	-2.571305
2	BS3	Bedminster, Southville, Bower Ashton, part of ...	51.443290	-2.608419
3	BS4	Brislington, Knowle, Knowle West, St Anne's, p...	51.425055	-2.587577
4	BS5	Easton, St George, Redfield, Whitehall, Eastvi...	51.460320	-2.570874

Figure 1: The first 5 rows of a dataframe giving the postcode districts in Bristol, with their locations.

Exploratory Data Analysis

Using folium to visualise the data given in the dataframe, we create the map in Figure 2.
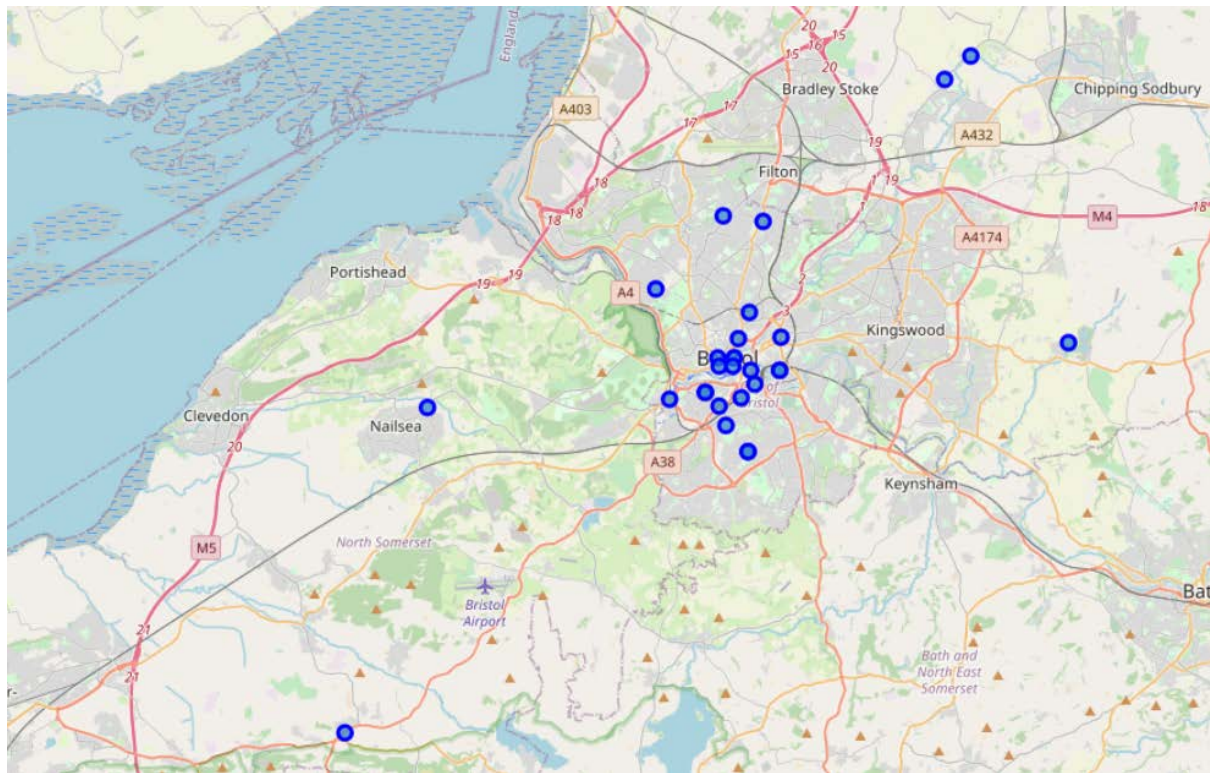

Figure 2: A map showing the centers of the postal districts in Bristol.

Several postcode districts in our dataframe are clearly far from the center of Bristol. Using a little trial and error, it was found that removing all districts with centers further than 0.04 degrees latitude and 0.1 degrees longitude from BS1 left a sensible distribution of postcode districts which comprise Bristol City. This results in an updated map seen in Figure 3.
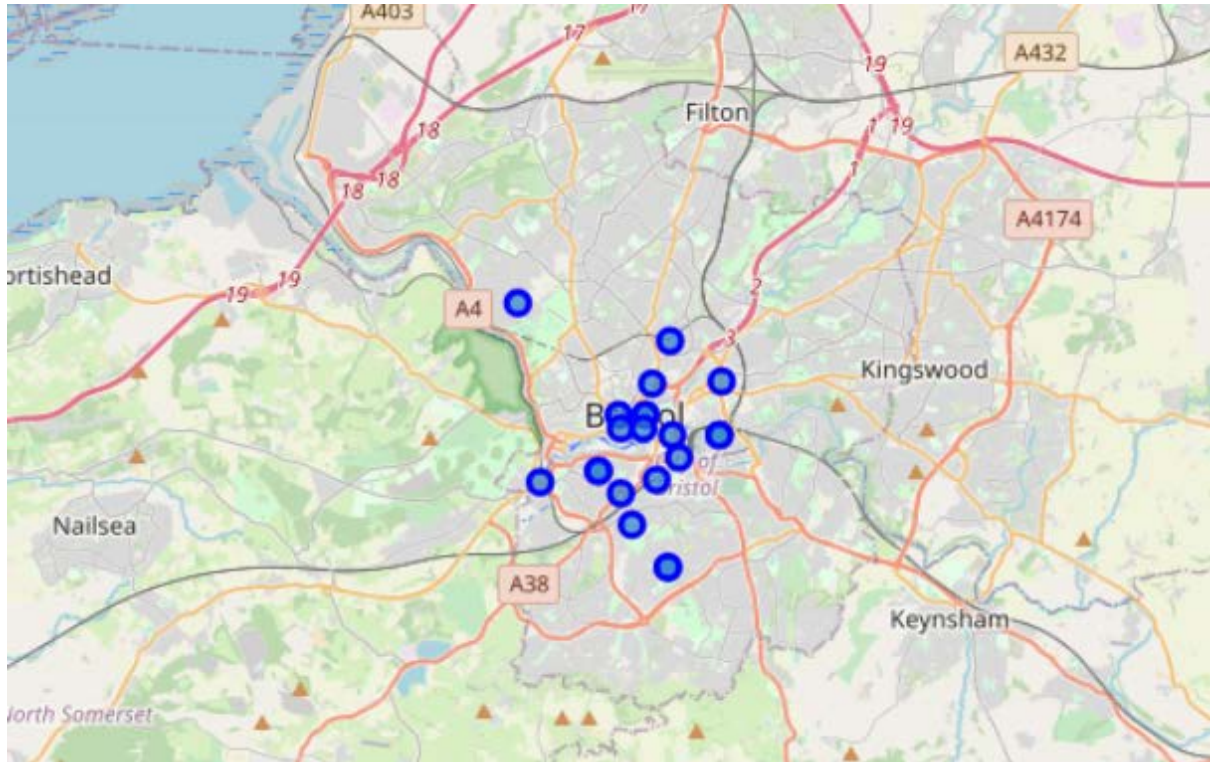
Figure 3: A map of Bristol postal district centers with outlying postcodes removed.

Next, a dataframe containing the first 100 venues within a 500 meter radius of the center of each district is generated using FourSquare and functions seen in previous areas of the Coursera Specialisation. The number of venues within this radius in each district has been counted, as seen below in Figure 4. Placing our restaurant in an area with few venues and therefore little passing traffic is not good for business, and so we remove all districts with fewer than 10 districts in a 500m radius of the center.

	Postcode district	Count
0	BS1	100
1	BS2	4
2	BS3	35
3	BS4	3
4	BS5	8
5	BS6	16
6	BS8	100
7	BS9	1
8	BS11	100
9	BS13	43
10	BS14	100
11	BS15	55
12	BS16	35
13	BS20	4
14	BS31	35
15	BS32	5
16	BS34	20
17	BS35	3
18	BS39	18
19	BS41	3
20	BS49	24

Figure 4: A count of the number of venues returned within 500m of the center of each district.

When looking at the types of venues in each district, shown in Figure 5, it can be seen that some districts in Bristol contain venues associated with low income residents, such as community centers, campgrounds and liquor stores. These districts are unsuitable for high end customers and so are removed from our list of suitable districts.

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array(['Coffee Shop', 'Beer Bar', 'Market', 'Pub', 'Theater', 'Jazz Club',
       'Japanese Restaurant', 'Burger Joint', 'Bar', 'Italian Restaurant',
       'Falafel Restaurant', 'Café', 'Lounge', 'Steakhouse',
       'Middle Eastern Restaurant', 'Vietnamese Restaurant',
       'Indian Restaurant', 'Asian Restaurant', 'Pie Shop',
       'Korean Restaurant', 'Pizza Place', 'Hookah Bar', 'Concert Hall',
       'Breakfast Spot', 'Cocktail Bar', 'Record Shop', 'Park',
       'Ice Cream Shop', 'Indie Movie Theater', 'Hotel', 'Art Gallery',
       'Caribbean Restaurant', 'Frozen Yogurt Shop', 'English Restaurant',
       'Nightclub', 'Street Art', 'Tapas Restaurant', 'Greek Restaurant',
       'Bookstore', 'Music Venue', 'Cosmetics Shop', 'Dessert Shop',
       'Brewery', 'Seafood Restaurant', 'Gay Bar', 'Chinese Restaurant',
       'Bed & Breakfast', 'Gastropub', 'Rental Car Location',
       'Community Center', 'Bakery', 'Deli / Bodega', 'Supermarket',
       'Grocery Store', 'Food & Drink Shop', 'Restaurant',
       'Arts & Entertainment', 'Organic Grocery',
       'Construction & Landscaping', 'Plaza', 'Gym / Fitness Center',
       'Sandwich Place', 'Mediterranean Restaurant',
       'Vegetarian / Vegan Restaurant', 'Train Station',
       'Laundry Service', 'Scenic Lookout', 'History Museum',
       'Portuguese Restaurant', 'American Restaurant', 'Science Museum',
       'Latin American Restaurant', 'Burrito Place', 'Thai Restaurant',
       'Casino', 'Aquarium', 'Road', 'Business Service',
       'French Restaurant', 'Clothing Store', 'Shopping Mall',
       'Gift Shop', 'Sushi Restaurant', 'Multiplex', 'Gym',
       'Fast Food Restaurant', 'Creperie', 'Museum', 'Memorial Site',
       'Waterfront', 'BBQ Joint', 'Sports Bar', 'Juice Bar', 'Food Stand',
       'Boat or Ferry', 'Platform', 'Soccer Stadium', 'Campground',
       'Cricket Ground', 'Hardware Store', 'Farm', 'Pharmacy',
       'Warehouse Store', 'Bus Stop', 'Diner', 'Furniture / Home Store',
       'Fish & Chips Shop', 'Pool', 'Mexican Restaurant', 'Liquor Store',
       'Gas Station'], dtype=object)
```

Figure 5: A list of the unique venue categories.

Results and Discussion

The final choice of districts with low-income venues removed is shown below in Figure 6.

	Postcode district	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	BS1	Bar	Pub	Café	Coffee Shop	Italian Restaurant
1	BS11	Bar	Pub	Café	Coffee Shop	Italian Restaurant
2	BS13	Pub	Bar	Hotel	Coffee Shop	Burger Joint
3	BS14	Bar	Pub	Café	Coffee Shop	Steakhouse
4	BS16	Platform	Pub	Coffee Shop	Café	Bakery
5	BS34	Pub	Pharmacy	Indian Restaurant	Breakfast Spot	Coffee Shop
6	BS49	Platform	Coffee Shop	Hotel	Bakery	Juice Bar
7	BS6	Café	Pub	Pizza Place	Gastropub	Mediterranean Restaurant
8	BS8	Bar	Café	Cocktail Bar	Asian Restaurant	Coffee Shop

Figure 6: A narrowed-down list of possible districts for the location of a new high-end restaurant.

Now we've reduced the number of districts suitable for our high-end restaurant, we can look for indicators of higher-income visitors. The BS8 district contains bars and cocktail bars, which are often frequented by higher income people, but few places to eat in the evening - as such I would recommend the BS8 area (Clifton, Highland, Hotwells and Leigh Woods) as a location for a new high-end restaurant in Bristol.

Conclusion

This project aims to guide a high-end restaurant owner in their search for a prime location for their new restaurant in Bristol, based on the number and type of food outlets and high-end stores in the surrounding area and the most common venues in the area. Once postal districts in the City have been determined and low-income areas removed, it has been determined that BS8 has a low

number of competitive businesses such as restaurants but a high number of cocktail bars and bars usually frequented by higher income visitors, and therefore would be the best location for a fine-dining restaurant in Bristol.