Analyzing If Liverpool or Manchester Is Better for Opening a German Restaurant

INTRODUCTION

1.1. **Problem**: A restaurant owner who specializes in German food has found success in London and is looking to expand to a new location. After researching several locations in England, the owner has it narrowed down to two northern cities: Liverpool and Manchester. The owner requests further analysis to determine the best location for his new restaurant.

1.2. **Background:** Liverpool and Manchester are two northern cities which thrived during the Industrial Revolution of the 19th centuries, and whose rivalry continues today. Now in the 21st century, both cities have undergone regeneration projects and have become attractive destinations for tourists. Liverpool is a port city located on Liverpool Bay, part of the Irish Sea, and its metropolitan area is the fifth largest in the United Kingdom. Due to its location near water, it has a diverse population with a wide range of cultures. It was named the 2008 European Capital of Culture and ranks seventh on the list of most visited cities in the UK. Liverpool Maritime Mercantile City was designated a World Heritage Site in 2004 by UNESCO and this status, along with the city's Premier League football clubs, museums and art galleries attracts many tourists each year. Manchester is the third-most populous metropolitan area in the United Kingdom and lies between the Pennines mountain chain and the Cheshire Plain. It is the third most visited city in the UK and is known for its music scene, sports and its variety of architectural style throughout the city. Both cities have a wide range of restaurants that specialize in a variety of foods.

1.3. **Interests:** This analysis would be useful for restaurant owners trying to decide where to open their next restaurant and could be expanded to include other cities as well. Tourists may also be interested as the analysis could help them be aware of the different types of restaurants that are available in a city which may also impact the hotel they choose depending on where the restaurants are clustered.

DATA ACQUISITION

2.1. **Data Sources**: Both Liverpool and Manchester neighborhoods and postal codes were scraped from Wikipedia Tables using BeautifulSoup. Restaurant venues for both Liverpool and Manchester were obtained from Foursquare API.

2.2. **Data Cleaning:** After the Wikipedia Tables were scraped, columns that were not needed for the analysis and postal codes that did not correspond to a geographic location or were duplicates of another postal code location were dropped. Once the

data was cleaned, the table for each city included the Postcode District and the corresponding Neighborhoods.

Liverpool City Data

	Postcode District	Neighborhoods
0	L1	City Centre
1	L2	City Centre
2	L3	City Centre, Everton, Vauxhall
3	L4	Anfield, Kirkdale, Walton
4	L5	Anfield, Everton, Kirkdale, Vauxhall

Fig 1: Liverpool Postcode District and Neighborhood Data for the first five postcodes in the table.

Liverpool's dataset include 40 postcode districts while Manchester's included 43 postcode districts. Using Geocoder, coordinates for the Liverpool neighborhoods and Manchester neighborhoods were added to the corresponding datasets.

Liverpool City Data

	Postcode District	Neighborhoods	Latitude	Longitude
0	L1	City Centre	53.395980	-2.981387
1	L2	City Centre	53.405595	-2.993264
2	L3	City Centre, Everton, Vauxhall	53.415671	-3.001066
3	L4	Anfield, Kirkdale, Walton	53.431620	-2.963469
4	L5	Anfield, Everton, Kirkdale, Vauxhall	53.427500	-2.969472

Fig 2: Liverpool Final Data Set, which includes Latitude and Longitude, for the first five postcodes in the table.

The Foursquare Venue Data was narrowed down to include restaurants only, and a table for each city was created containing the Neighborhood with latitude and longitude, the venue with latitude and longitude, the venue ID and the venue category.

Liverpool Venue Data

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue ID	Venue Category
0	City Centre	53.39598	-2.981387	Coffee and Fandisha	53.396111	-2.979320	53d90299498e26f5393fd813	Café
1	City Centre	53.39598	-2.981387	Chapters Of Us	53.395713	-2.981771	5dfcd47e675fbf0008425a29	Café
2	City Centre	53.39598	-2.981387	McDonald's	53.396390	-2.984590	4b8970fcf964a520903632e3	Fast Food Restaurant

Fig 3: Liverpool Venue data set of the first three venues in the table.

This data will be used to determine the best location for the restaurant owner to build his new restaurant by analyzing types of restaurants, clustering of restaurants and location of restaurants in Manchester and Liverpool.