

# Capstone Project - The Battle of Neighborhoods

## 1. Introduction

Warsaw and Berlin are capital cities of countries which are especially dear to me. With a 4.2% GDP growth in 2019, Poland ranks as the second European's fastest-growing economy. Warsaw as one of the fastest-growing capital cities in the EU is also the place where I want to live after my Master studies.

These capital cities are located in two neighboring countries. Germany with its capital Berlin is one of the biggest economic powers in the world.

Similarities in these two capital cities will be checked to find patterns between venues which are located there. Comparison of these two capitals will help people who are looking for answers related to similarities in these places. It will be also valuable for people who are curious and want to know places which are located in Warsaw and Berlin.

## 2. Data

For this project data available on the Foursquare's API will be used. It will be used to check data in Berlin and Warsaw in terms of their neighborhoods. The data used includes information about different venues and their neighborhoods.

Moreover data about districts of these two cities, which was available on wikipedia.com, was used:

Warsaw: [https://en.wikipedia.org/wiki/Districts\\_of\\_Warsaw](https://en.wikipedia.org/wiki/Districts_of_Warsaw)

Berlin: [https://en.wikipedia.org/wiki/Boroughs\\_and\\_neighborhoods\\_of\\_Berlin](https://en.wikipedia.org/wiki/Boroughs_and_neighborhoods_of_Berlin)

## 3. Methodology

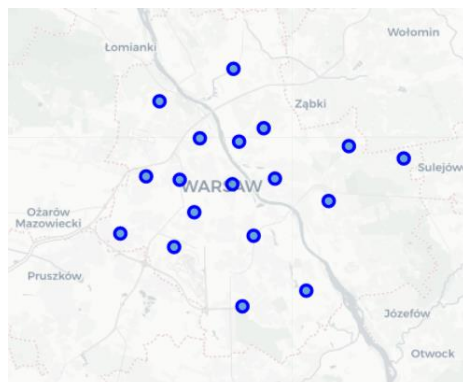
We will use the KMeans ML technique to segment districts with similar objects based on neighborhood data, and then we can judge the similarity or dissimilarity between districts and two cities

## 4. Results

The geographical coordinates of Warsaw are 52.2319237, 21.0067265.

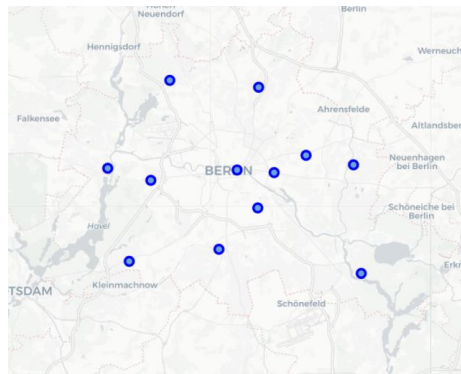
The geographical coordinates of Berlin are 52.5170365, 13.3888599.

Points which are the coordinates of Warsaw districts:



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Points which are the coordinates of Berlin districts:



Number of venues in Berlin is 300

Number of venues in Warsaw is 218.

Number of venues in different districts:

District	
Bemowo	11
Bielany	4
Charlottenburg-Wilmersdorf	9
Friedrichshain-Kreuzberg	100
Lichtenberg	7
Marzahn-Hellersdorf	9
Mitte	57
Mokotow	4
Neukoelln	86
Ochota	17
Pankow	4
Praga-Polnoc	6
Praga-Poludnie	5
Reinickendorf	4
Rembertow	4
Spandau	8
Srod miescie	100
Steglitz-Zehlendorf	7
Targowek	4
Tempelhof-Schoeneberg	6
Treptow-Koepenick	3
Ursus	5
Ursynow	6
Wawer	4
Wesola	4
Wilanow	1
Wlochy	5
Wola	16
Zoliborz	22

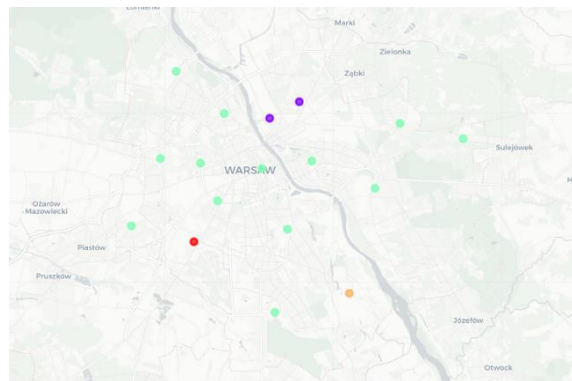
There are 171 unique categories of venues.

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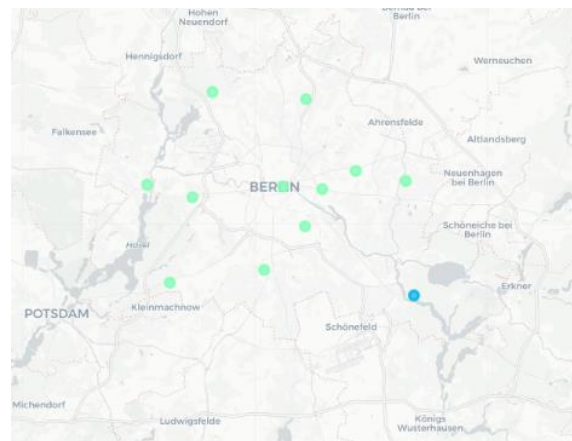
## Ten most common venues in all districts:

	District	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Bemowo	Food & Drink Shop	Sporting Goods Shop	Bus Station	Donut Shop	Furniture / Home Store	Sandwich Place	Supermarket	Electronics Store	Italian Restaurant	Café
1	Bielany	Metro Station	Bus Line	Bus Station	Bike Rental / Bike Share	Yoga Studio	Fountain	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant
2	Charlottenburg-Wilmersdorf	Italian Restaurant	Hotel	Pizza Place	Indian Restaurant	Bus Stop	Light Rail Station	Café	Gas Station	Exhibit	Food & Drink Shop
3	Friedrichshain-Kreuzberg	Café	Bar	Pizza Place	Italian Restaurant	Bakery	Thai Restaurant	Indian Restaurant	Vietnamese Restaurant	Vegetarian / Vegan Restaurant	Organic Grocery
4	Lichtenberg	Furniture / Home Store	Hotel	Hot Dog Joint	Tram Station	Indoor Play Area	Cafeteria	Exhibit	Food Court	Food & Drink Shop	Flea Market
5	Marzahn-Hellersdorf	Supermarket	Metro Station	Shopping Mall	Doner Restaurant	Trail	Pool	Drugstore	Yoga Studio	Event Space	Flea Market
6	Mitte	German Restaurant	Museum	History Museum	Café	Hotel	Art Gallery	Art Museum	Fountain	Concert Hall	Plaza
7	Mokotów	Arcade	Skate Park	Intersection	Café	Yoga Studio	Exhibit	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant
8	Neukölln	Bar	Café	Coffee Shop	Middle Eastern Restaurant	Food & Drink Shop	Supermarket	Italian Restaurant	Dive Bar	Cocktail Bar	Lebanese Restaurant
9	Ochota	Hotel	Pharmacy	Basketball Court	Dessert Shop	Diner	Electronics Store	Cable Car	Skating Rink	Department Store	Supermarket
10	Pankow	Turkish Restaurant	Tram Station	Asian Restaurant	Gas Station	Yoga Studio	Event Space	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant
11	Praga-Polnoc	Light Rail Station	Cosmetics Shop	Plaza	Bus Station	Comedy Club	Supermarket	Yoga Studio	Exhibit	Food & Drink Shop	Flea Market
12	Praga-Południe	Park	Bus Line	Garden Center	Bar	Road	Yoga Studio	Event Space	Food & Drink Shop	Flea Market	Fast Food Restaurant
13	Reinickendorf	Hostel	Food & Drink Shop	Insurance Office	Nature Preserve	Event Space	Food Court	Flea Market	Fast Food Restaurant	Farmers Market	Falafel Restaurant
14	Rembertow	Pizza Place	Discount Store	Beer Garden	Café	Yoga Studio	Exhibit	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant
15	Spandau	Pizza Place	Bus Stop	Park	Argentinian Restaurant	Plaza	Supermarket	Electronics Store	Flea Market	Fast Food Restaurant	Farmers Market
16	Srodmiescie	Café	Cocktail Bar	Coffee Shop	Italian Restaurant	Beer Bar	Yoga Studio	Bakery	Boutique	Polish Restaurant	Bar
17	Steglitz-Zehlendorf	Italian Restaurant	Bus Stop	History Museum	Liquor Store	Yoga Studio	Exhibit	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant
18	Targowek	Bus Station	Cupcake Shop	Gym / Fitness Center	Yoga Studio	Event Space	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant	Farmers Market
19	Tempelhof-Schöneberg	Pet Store	Food & Drink Shop	Industrial Estate	Supermarket	Grocery Store	Climbing Gym	Yoga Studio	Event Space	Flea Market	Fast Food Restaurant
20	Treptow-Koepenick	Lake	Beach	Yoga Studio	French Restaurant	Fountain	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant	Farmers Market
21	Ursow	Hotel	Park	Mexican Restaurant	Train Station	Supermarket	Yoga Studio	Event Space	Food & Drink Shop	Flea Market	Fast Food Restaurant
22	Ursynow	Dessert Shop	Food Court	Food & Drink Shop	Supermarket	Italian Restaurant	Café	Event Space	Flea Market	Fast Food Restaurant	Farmers Market
23	Wawer	Food & Drink Shop	Athletics & Sports	Falafel Restaurant	Gun Range	Yoga Studio	Electronics Store	Food Court	Flea Market	Fast Food Restaurant	Farmers Market
24	Wiesla	Tennis Court	Pizza Place	Plaza	Train Station	Yoga Studio	Flea Market	Fast Food Restaurant	Farmers Market	Falafel Restaurant	Exhibit
25	Wilanow	Baby Store	Yoga Studio	Event Space	Fountain	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant	Farmers Market	Falafel Restaurant
26	Wlochy	Tram Station	Accessories Store	Bed & Breakfast	Hotel	History Museum	Historic Site	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant
27	Wola	Café	Soccer Field	Theme Park Ride / Attraction	Skating Rink	Bus Station	Rock Club	Motorcycle Shop	Music Store	Bar	Gastropub
28	Zoliborz	Café	Burger Joint	Italian Restaurant	Beer Bar	Park	Metro Station	Bar	Plaza	Kebab Restaurant	Thai Restaurant

## Clusters in Warsaw:



## Clusters in Berlin:



Based on data which is provided by Foresquare and research made, we can conclude that Warsaw and Berlin are similar cities. Results from this research could give a good insight for people who are interested in these two capital cities. Thanks to this research it is possible for example to conclude which venues are the most common in all districts in Berlin and Warsaw etc.