

# The Battle of Neighborhoods (Week 2)

1. A full report consisting of all of the following components **(15 marks)**:
  - Introduction where you discuss the business problem and who would be interested in this project.
  - Data where you describe the data that will be used to solve the problem and the source of the data.
  - Methodology section which represents the main component of the report where you discuss and describe any exploratory data analysis that you did, any inferential statistical testing that you performed, if any, and what machine learnings were used and why.
  - Results section where you discuss the results.
  - Discussion section where you discuss any observations you noted and any recommendations you can make based on the results.
  - Conclusion section where you conclude the report.
2. A link to your Notebook on your Github repository pushed showing your code. **(15 marks)**
3. Your choice of a presentation or blogpost. **(10 marks)**

## Introduction of Business Problem and Who Would be Interested

The scenario or business problem is that I need to find an optimal location for a restaurant Berlin, Germany. I am working for an Italian restaurant who is looking for an optimal location to attract customers but where the market is not overly saturated. Berlin has a lot of restaurants, so I am interested in areas with no Italian restaurants in vicinity. Ideally, I want the location to be close to the city center.

The company stakeholders are interested in this data as they want to open a new restaurant in an area that provides the most opportunity for success.

## Methodology Section

### Data Sources:

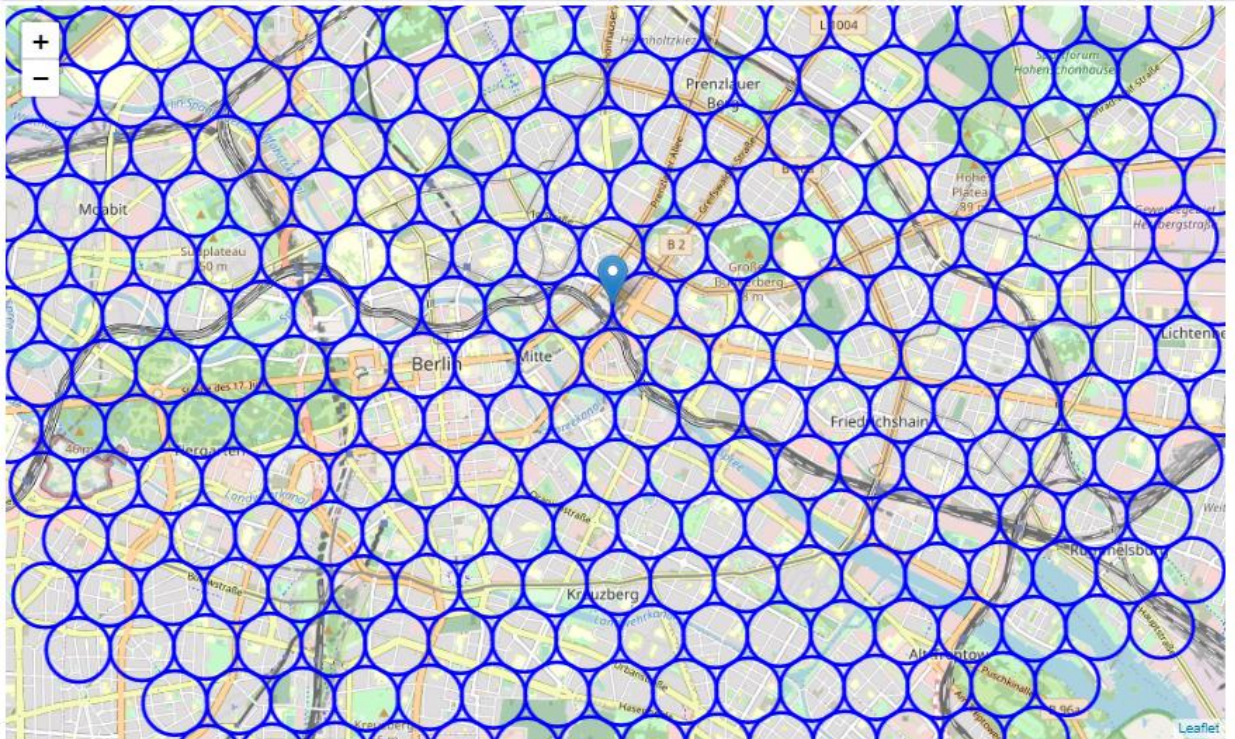
Following data sources will be needed to extract/generate the required information:

- centers of candidate areas will be generated algorithmically and approximate addresses of centers of those areas will be obtained using Google Maps API reverse geocoding
- number of restaurants and their type and location in every neighborhood will be obtained using Foursquare API
- coordinate of Berlin center will be obtained using Google Maps API geocoding

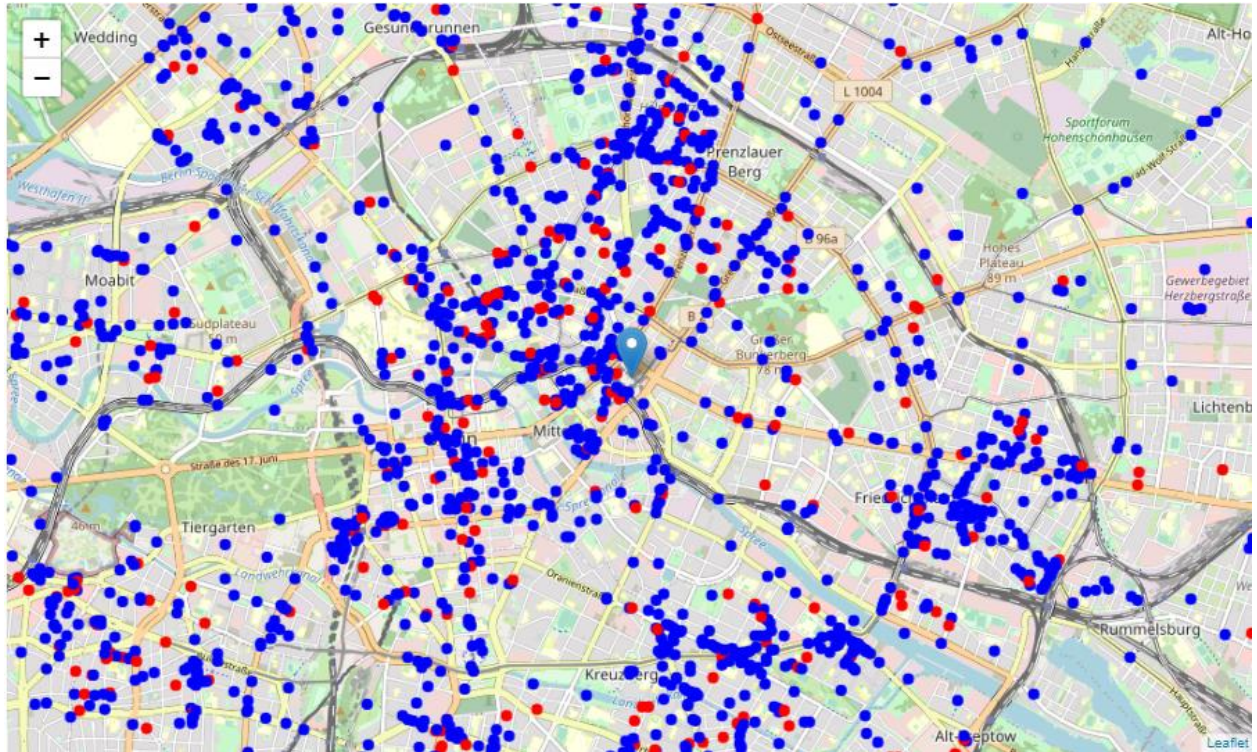
## Exploratory Data Analysis

The steps below give an overview of the process used to create the data. The coding can be found in the ipynb attachment called Capstone\_The-Battle-of-the-Neighborhoods (1).

1. Create a latitude & longitude coordinates for centroids of our candidate neighborhoods. I created a grid of cells covering our area of interest which is approximately 12x12 kilometers centered around Berlin city center.



2. Based on this data, I created a Google Maps API to get approximate addresses of those locations and narrow down our search so that I can do a Foursquare API
3. From the Four Square data I was able to create a data frame and then plot the map based on restaurants.
4. An initial pull was done returning a wide variety of food choices so the search was refined to restaurants with restaurant type labeled as red for Italian and blue for non-Italian.
5. From the map below, I can begin to focus in on each area and begin to draw some conclusions and make recommendations. The individual area process is repeated over and over and heat maps are created to help narrow down the best recommendation.

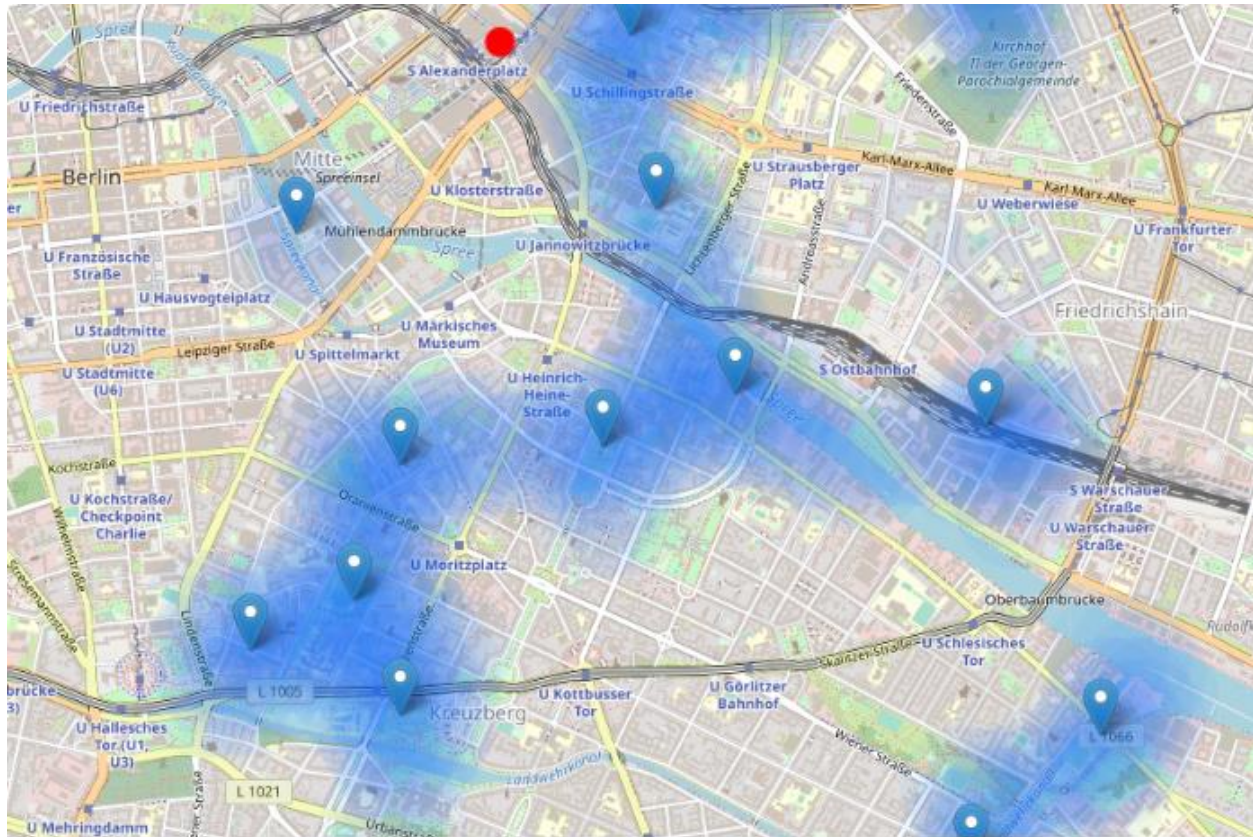


## Results and Discussion

Our analysis shows that although there is a great number of restaurants in Berlin with over 2000 in our initial area of interest. Highest concentration of restaurants was detected north and west from Berlin. Lowest concentration in areas south, south-east and east Berlin.

Due to this, discover I focused on corresponding the boroughs in this area. From these 15 “zones” I created to review. Lowest overall concentration level was determined to be south of Alexanderplatz.





## Conclusion

Purpose of this project was to identify Berlin areas close to center with low number of restaurants (particularly Italian restaurants) in order to aid stakeholders in narrowing down the search for optimal location for a new Italian restaurant. By calculating restaurant density distribution from Foursquare data I was able to focus in on the area south and southeast and discover that there is an opportunity to open an Italian restaurant near Alexanderplatz.