

## **Introduction**

In this project, I will try to find an optimal location to open a new Ethiopian restaurant in Washington, D.C.

D.C. already has many highly-rated Ethiopian restaurants. We want to determine where the restaurant could go that doesn't already have other Ethiopian restaurants in the area. In Washington, D.C. parking can be a nightmare. Therefore, we would like to place this restaurant as close to a metro stop as possible so that it is easily accessible to residents living all around the city.

We will determine the best neighborhoods to open this restaurant, based on the above criteria. The top neighborhoods will be presented, along with their advantages and disadvantages, to the stakeholder.

## **Data**

The data we need to make our decision are:

- number of existing Ethiopian restaurants in the neighborhood
- location of metro stops
- regularly spaced grid of locations, centered around city center, which will be used to define neighborhoods

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

- the number of Ethiopian restaurants and their locations in every neighborhood will be obtained using Foursquare API
- the location of metro stops will be obtained using the Washington Metropolitan Area Transit Authority API
- the coordinates of Washington, DC's center will be visually approximated; neighborhood centers will be generated algorithmically

## **Methodology**

In this project, I will find areas of Washington, D.C. that have a low density of Ethiopian restaurants and are near a metro stop.

In first step, I collected the relevant data, which included the location of every Ethiopian restaurant and metro stop in D.C.

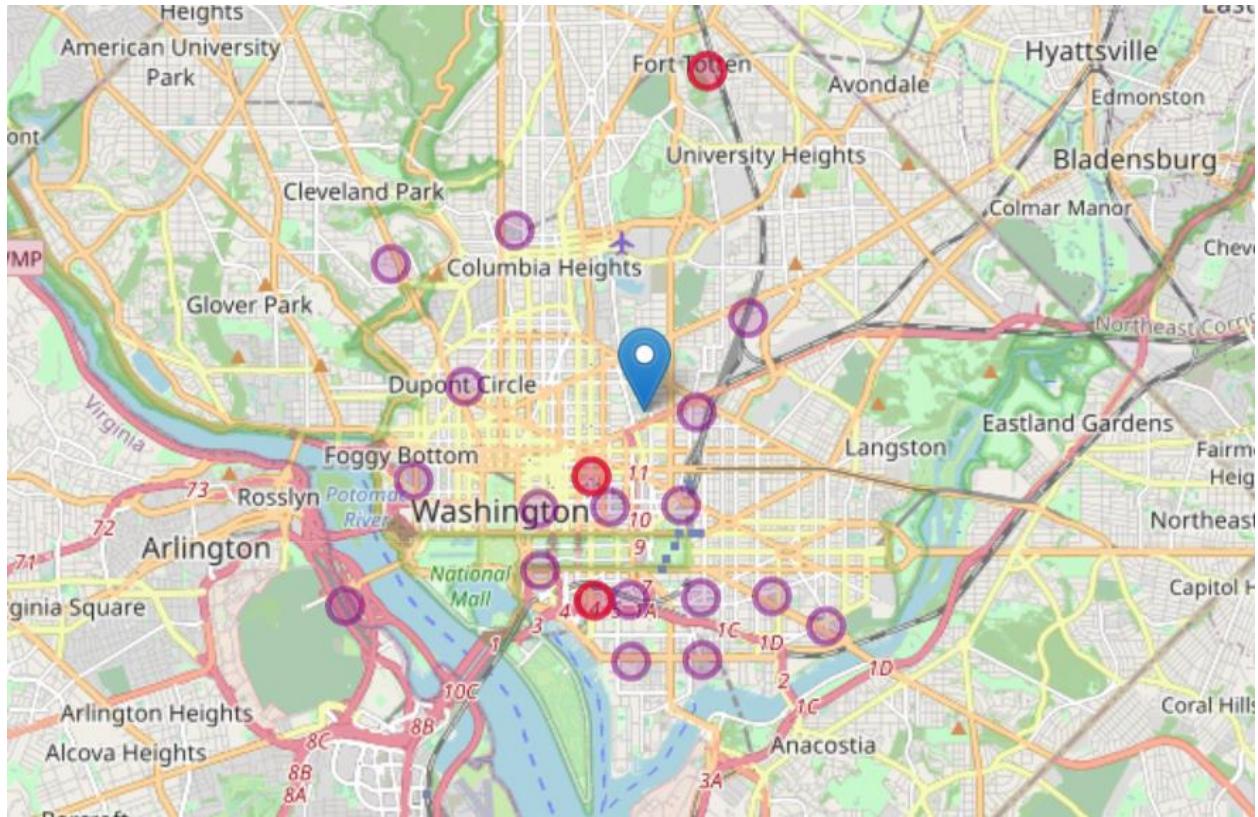
In the analysis I will calculate the number of metro stops and Ethiopian restaurants in every neighborhood of D.C.

In the last step, I will identify the neighborhoods that have at least one metro stop and the fewest number of Ethiopian restaurants.

## **Results**

First, we determined which neighborhoods had at least one metro stop to ensure they would be accessible locations and found 26 candidate neighborhoods. Next, we checked which of those neighborhoods have the fewest Ethiopian restaurants. We found 20 neighborhoods that did not contain any Ethiopian restaurants, so we kept those as our final recommended areas for further exploration

(mapped below in purple). We notice that three of these areas had two metro stops (mapped below in red), making them even more accessible.



## Discussion

While Washington, D.C. has both a large number of restaurants and more specifically, Ethiopian restaurants, this analysis shows that there are several areas of the city that have a low density of Ethiopian restaurants and are still quite accessible to a wide customer base via the metro.

First, we determined which neighborhoods had at least one metro stop, so we would know that any area in this neighborhood would be very accessible. We found 26 neighborhoods in D.C. that had a metro inside.

Next, we checked the Ethiopian restaurant density in these neighborhoods. We found that there were 20 neighborhoods that had a metro stop and did not contain any Ethiopian restaurants currently. In fact, there were 3 of these neighborhoods that had two metro stops, meaning they are even more accessible.

These three areas could potentially be great candidates to explore to start a new Ethiopian restaurant. However, more analysis will have to be done to determine which of these areas is best. We want to make sure these are desirable neighborhoods to visit and eat and explore other things to do in the area; for example, you might be more likely to go out to eat dinner in an area with fun bars to visit later!

We would recommend the resulting areas from the analysis be explored further before determining the final location.

### **Conclusion**

The purpose of this project was to help our stakeholders narrow down the best locations to start a new Ethiopian restaurant in Washington, D.C. By determining which areas have metro stations, we have first found locations that can be easily visited by a wide variety of customers. Next, we were able to find a variety of these neighborhoods that did not have any competing Ethiopian restaurant. These areas are a great starting point for further exploration by the stakeholder. The final decision on restaurant placement should be determined by the stakeholder after taking into account other important factors.