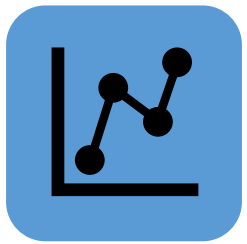
IBM Data Science Professional Certificate
Capstone Project

Finding the right location for an Indian restaurant in Manhattan with Data Science

5.8.19, Philipp Schützbach

Agenda

1.Goal of the Project



2. Data

3. Methodology

4. Results

Goal of the Project:

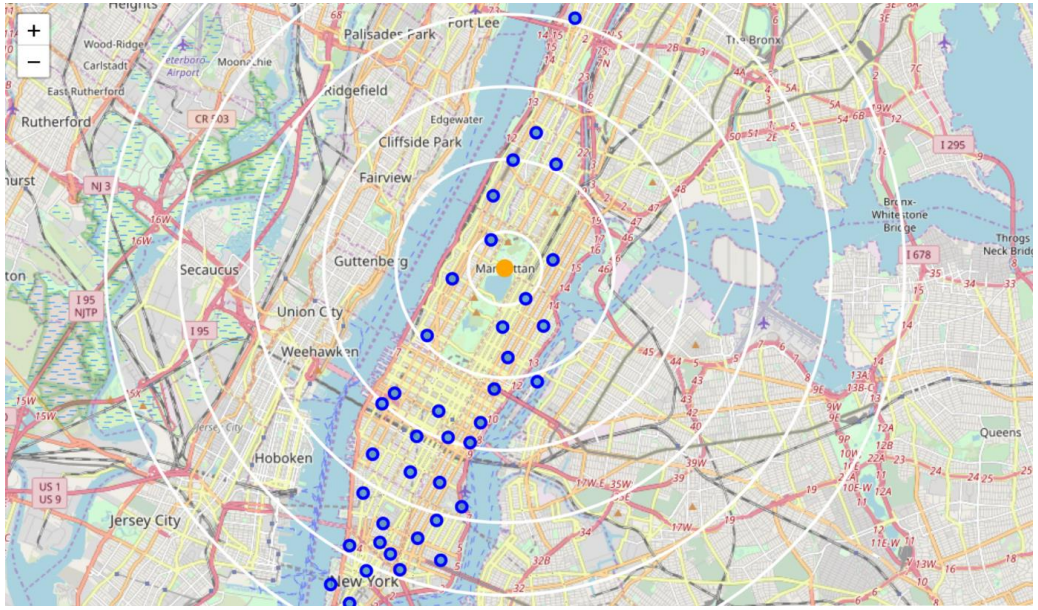
In Manhattan there are 2874 restaurants and 274 Indian restaurants. For stakeholders success in opening a Indian restaurant the right location is crutial. Goal of this project is to identify promising locations…

- that are not already crowded with restaurants.
- where there are as few Indian restaurants as possible in the closer area around.
- where the share of Indian restaurants in the neighbourhood is very little.
- which are as close to the centre of Manhattan as possible.

All the nesseccary data about the neigbourhoods and restaurants of Manhattan is available for free

Neighbourhood data:

- Location of each neighbourhood
- Borders of each neighbourhood



Restaurant data:

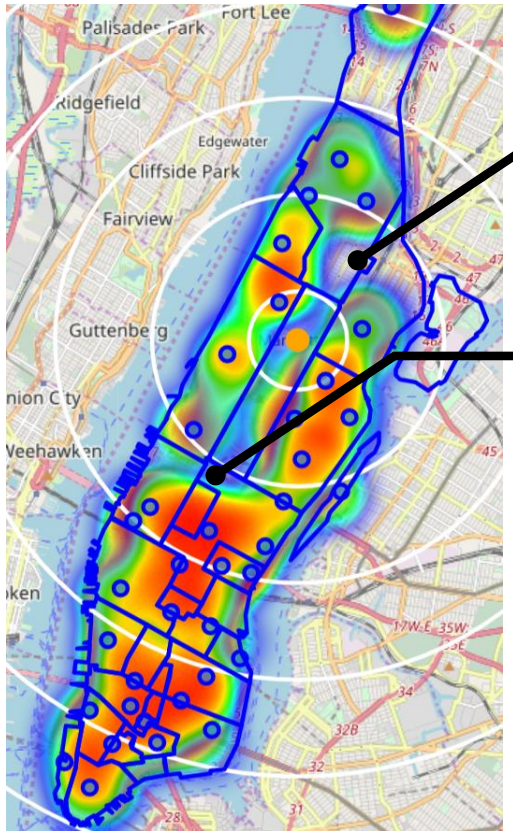
- Location of all restaurants
- Type of all restaurants

Goal of the methodology is to generate a map of regions where there are no restaurants in a radius of 250m and no Indian restaurant within a radius of 500m as close to the center of Manhattan as possible.

1. **Identify** areas with **low density of restaurants/Indian restaurants** as **close** as possible to the **centre of Manhattan.**
   - Visualize density with heatmaps
   - Visualize share of and distance to next Indian restaurant wih choropleth maps
2. For **identified areas define** a **grid of cells** and **calculate** for each cell:
   - Latitude
   - Longitude
   - Nearby restaurants
   - Distance to next Indian restaurant
   - Distance to centre of Manhattan
3. **Filter** the **data** for grid cells where…
   - There is no restaurant within 250m radius.
   - There is no Indian restauant within at least 500m radius.
4. **Visualize** the **filtered dataset** as a **regionmap** of **promising locations**.

Two areas with low denisty of restaurants and Indian restaurants can be found north/north-east and south/south-west of central park.

1. **Identify** areas with **low density of restaurants/Indian restaurants** as **close** as possible to the **centre of Manhattan.**
   - Visualize density with heatmaps
   - Visualize share of and distance to next Indian restaurant wih choropleth maps



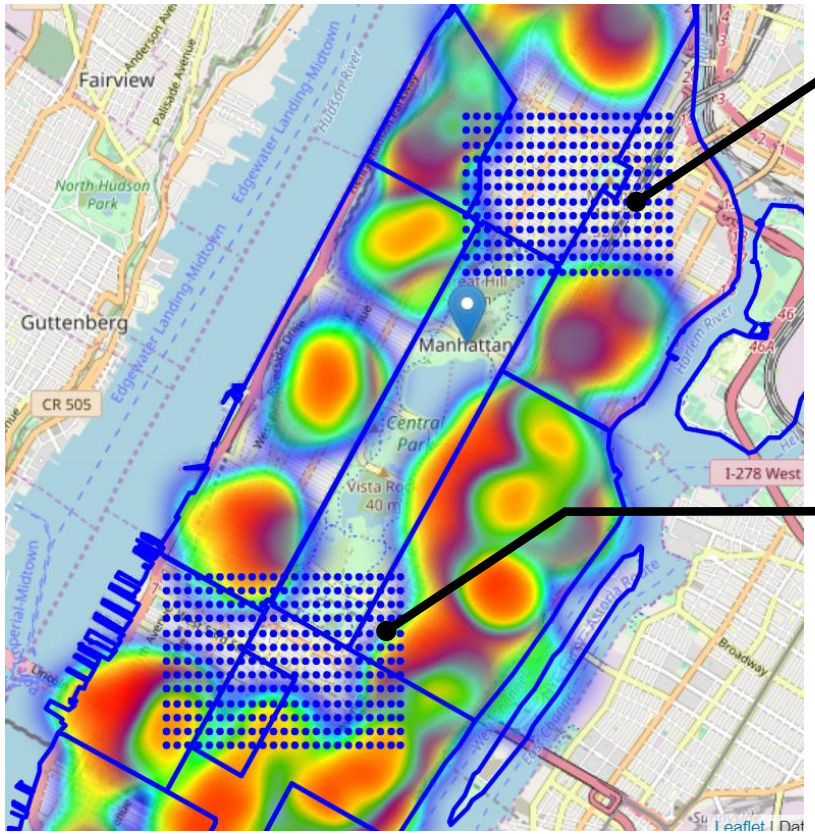
Area north/ north-east

Area south/ south-west

The defined grid of 539 cells perfectly cover the both identified areas.

2. For **identified areas define** a **grid of cells** and **calculate** for each cell:
   - Latitude
   - Longitude
   - Nearby restaurants
   - Distance to next Indian restaurant
   - Distance to centre of Manhattan

	Latitude	Longitude	Restaurants nearby	Distance next Indian Restaurant	Distance to Center
7	40.764449	-73.993485	0	767.0	6139.0
8	40.765649	-73.993485	0	959.0	5996.0
9	40.766849	-73.993485	0	1155.0	5858.0
10	40.768049	-73.993485	0	1353.0	5723.0
11	40.769249	-73.993485	0	1553.0	5592.0

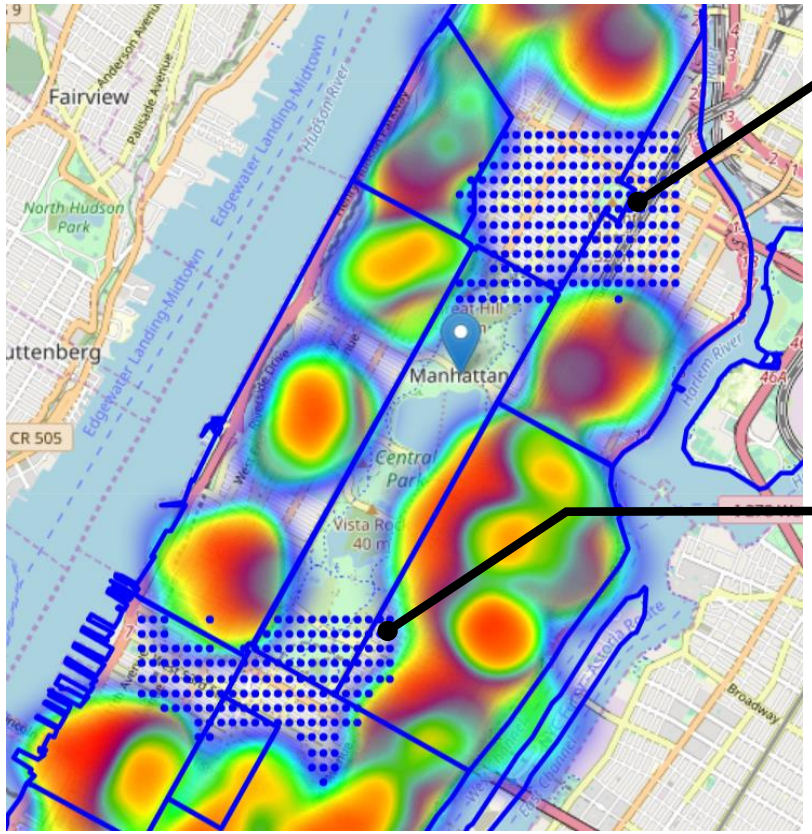


Grid north/ north-east

Grid south/ south-west

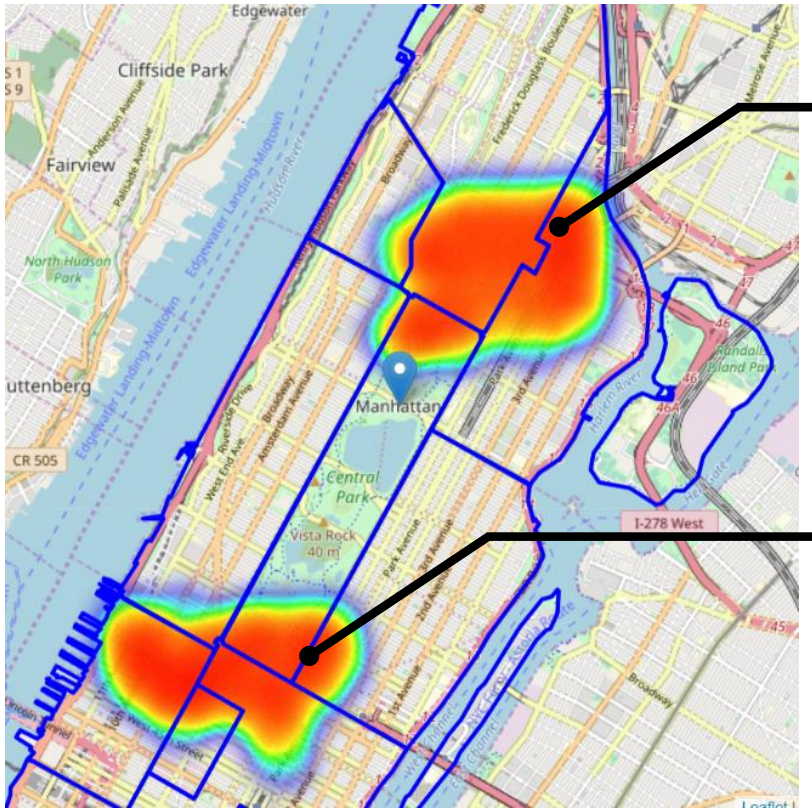
Filtering the calculated figures results in a perfectly fitting grid of cells of 372 grid points.

3. **Filter** the **data** for grid cells where…
   - There is no restaurant within 250m radius.
   - There is no Indian restauant within at least 500m radius.



By visualizing the filtered grid cells we get a regionmap of promising locations to open an Indian restaurant in Mahattan.

4. **Visualize** the **filtered dataset** as a **regionmap** of **promising locations**.



The regionmap as a result of this analysis builds the foundation for stakeholders making their descision where to open an Indian restaurant in Manhattan.

- The purpose of this analysis was to present attractive locations to the stakeholders to open up an Indian restaurant in Manhattan.
- Therefore, the analysis used data science to calculate the density of restaurants/Indian restaurants. By visualizing those densities, we were able to identify two areas quiet close to the centre of Manhattan where the density of restaurants/Indian restaurants is very low.
- This analysis will build the foundation for stakeholders for making a decision where to open up an Indian restaurant. For the decision additional factors needs to be taken into account like for example the rent, if there are available locations for a restaurant, the population density and the overall attractiveness of the neighbourhood.