

No Place Like Home

Recommendation system for relocations.

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Building recommendation engine to help people find new home most similar to previous one

Worldwide migration, UN data:

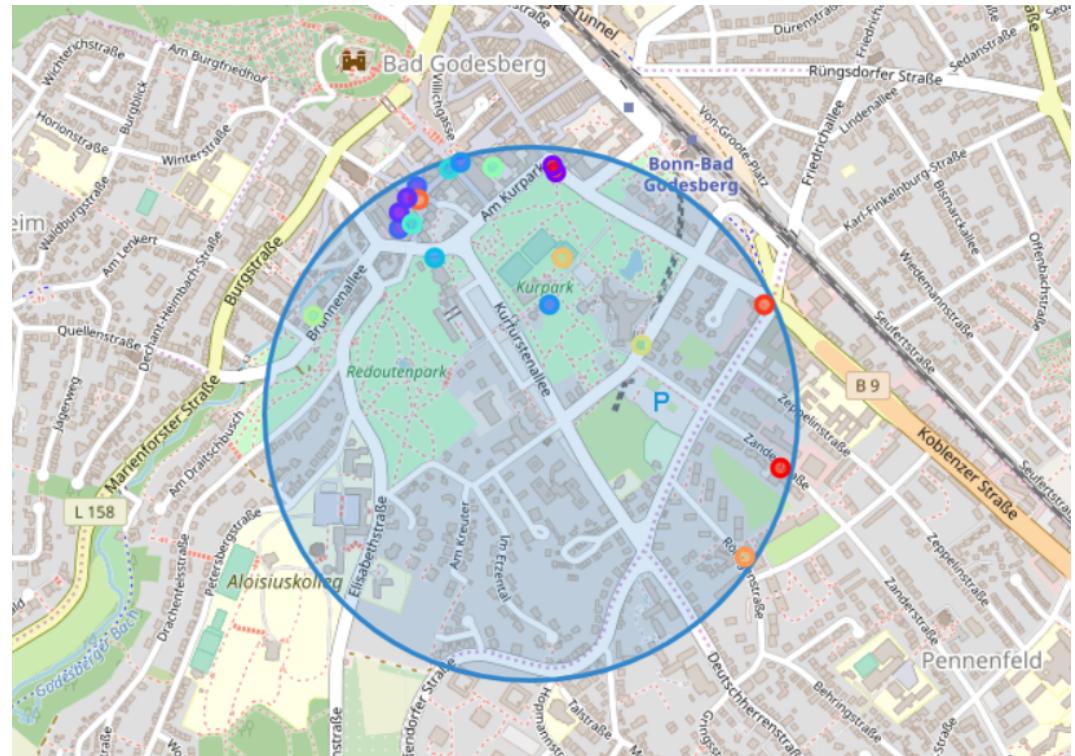
Year	Number of migrants, mln
2017	258
2015	248
2010	220
2005	191
2000	173

Relocation is a stress, so I want go create a tool to help people find a neighbourhood in their new place to live that resembles their home as mush as possible.



First let's enter our home address and have a look at all the venues around it

9, Kurfürstenallee, Alt-Godesberg, Bad Godesberg, Bonn, Nordrhein-Westfalen, 53177, Deutschland
(50.67920355, 7.155436486997861)



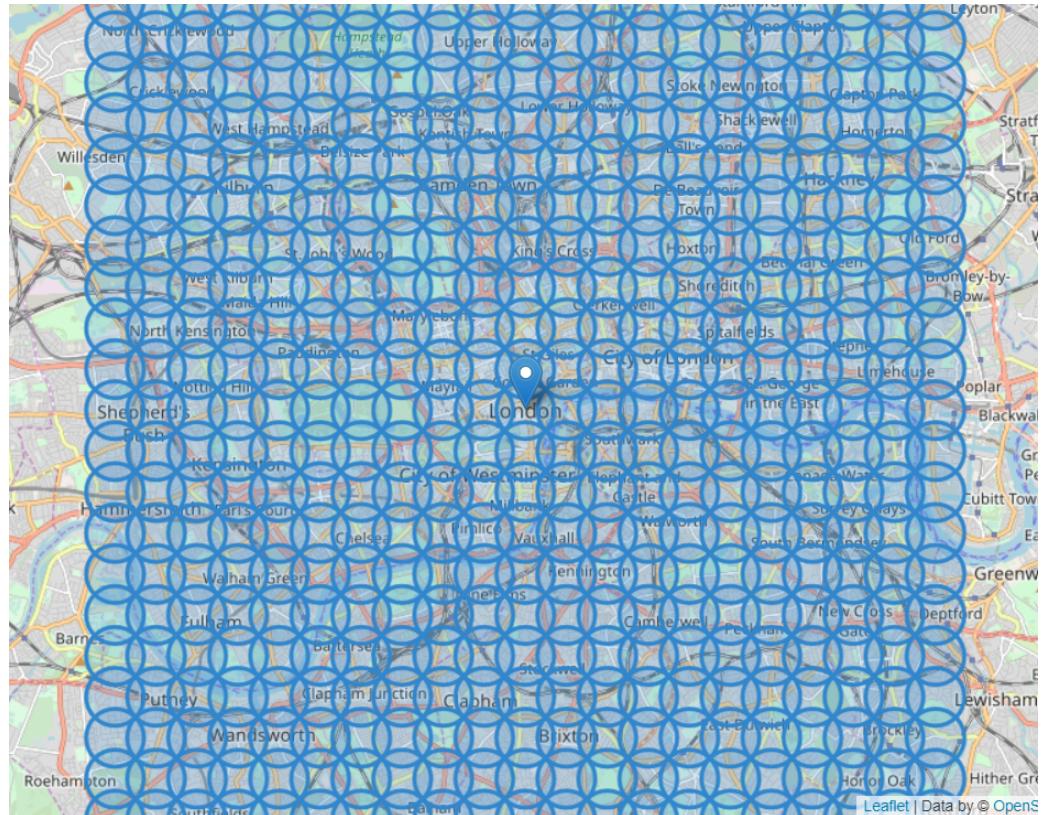
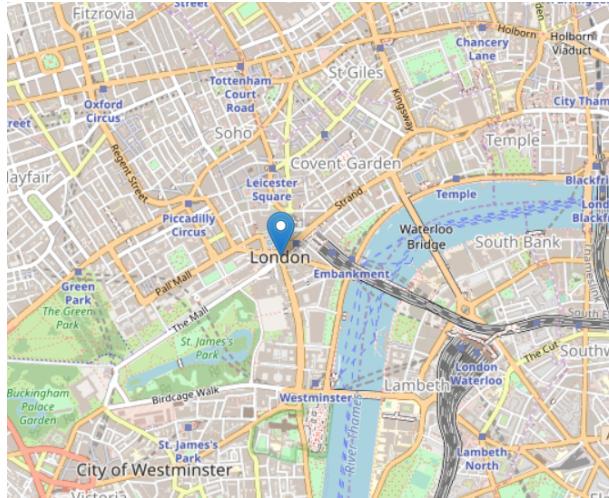
	Venue	Venue Latitude	Venue Longitude	Venue Category	CategoryID
0	Terra Vino	50.680863	7.149654	Italian Restaurant	4bf58dd8d48988d110941735
1	Fischgeschäft Stuch	50.683327	7.153269	Fish Market	4bf58dd8d48988d10e951735
2	La Redoute	50.681829	7.152891	Event Space	4bf58dd8d48988d171941735
3	dm-drogerie markt	50.682312	7.151922	Drugstore	5745c2e4498e11e7bccabdbd
4	Ruby's Baguetterie	50.683362	7.156062	French Restaurant	4bf58dd8d48988d10c941735

Data used



Venue	Names of every venue in a neighbourhood.
Venue Latitude	Used to determine location on the map when visualizing results
Venue Longitude	Used to determine location on the map when visualizing results
Venue Category	Used to filter the results and build weights vector and recommendation matrix
Category ID	Used to form queries in the new city to filter out all venues categories that don't present in home neighbourhood

Chosen city of relocation is being divided into partially overlapping circles one of which (maybe more) will be recommended as a new place to live



Venue data from every circle (or region) is collected, cleaned and prepared

	Neighborhood	Burger Joint	Clothing Store	Event Space	Fish Market	Flower Shop	French Restaurant	Hotel	Italian Restaurant	Metro Station	Park	Pizza Place	Shopping Mall	Theater	Tunnel	Video Store
0	Region #0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1	Region #0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
4	Region #1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5	Region #1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
6	Region #1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0



	Burger Joint	Clothing Store	Event Space	Fish Market	Flower Shop	French Restaurant	Hotel	Italian Restaurant	Metro Station	Park	Pizza Place	Shopping Mall	Theater	Tunnel	Video Store
0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
1	0	0	1	0	0	0	2	0	0	1	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3	2	0	4	0	1	0	5	9	1	5	1	0	3	0	0
4	2	2	1	0	0	1	9	7	2	4	1	2	1	0	0



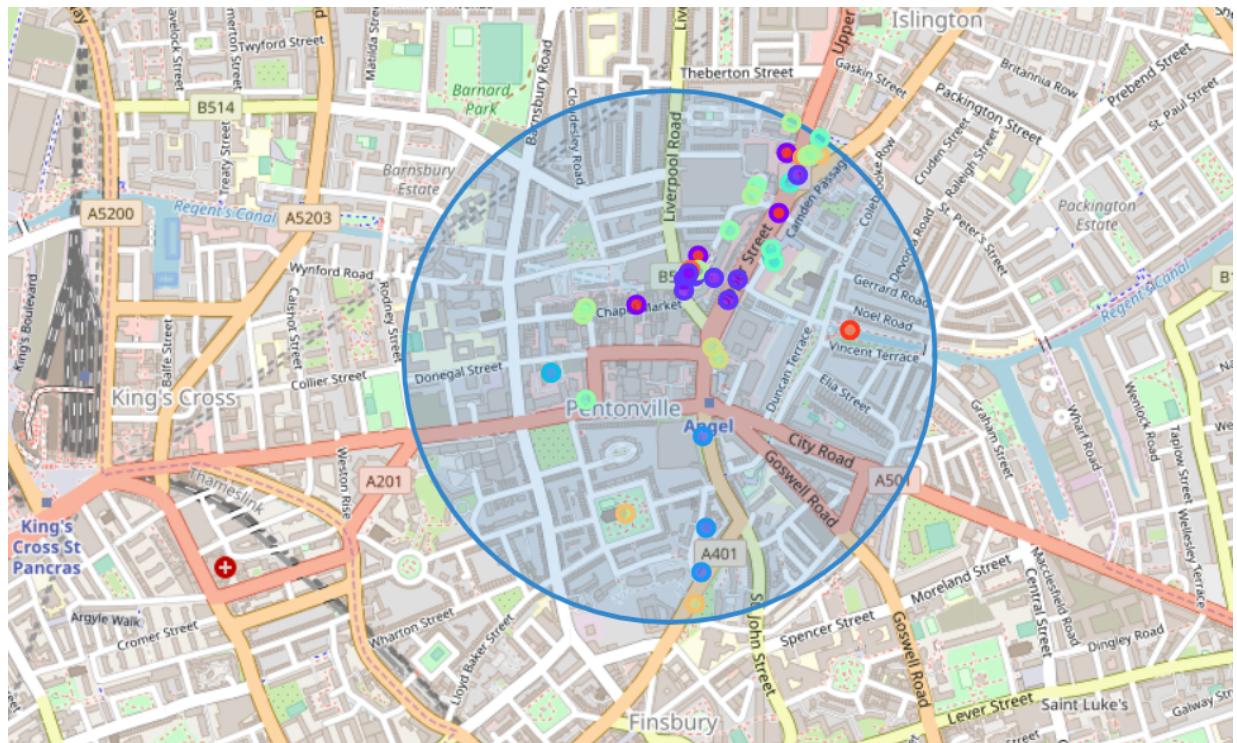
	Neighborhood	Burger Joint	Clothing Store	Event Space	Fish Market	Flower Shop	French Restaurant	Hotel	Italian Restaurant	Metro Station	Park	Pizza Place	Shopping Mall	Theater	Tunnel
0	Region #0	0.000000	0.000000	0.000000	0.0	0.000000	0.000000	0.000000	0.693147	0.000000	0.693147	0.000000	0.000000	0.000000	0.0
1	Region #1	0.000000	0.000000	0.693147	0.0	0.000000	0.000000	1.098612	0.000000	0.000000	0.693147	0.000000	0.000000	0.000000	0.0
2	Region #10	0.000000	0.000000	0.000000	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	1.098612	0.000000	0.000000	0.000000	0.0
3	Region #100	1.098612	0.000000	1.609438	0.0	0.693147	0.000000	1.791759	2.302585	0.693147	1.791759	0.693147	0.000000	1.386294	0.0
4	Region #101	1.098612	1.098612	0.693147	0.0	0.000000	0.693147	2.302585	2.079442	1.098612	1.609438	0.693147	1.098612	0.693147	0.0



Content-based recommendation algorythm is applied and the system shows winning region to user

Neighborhood	
Region #174	1.124896
Region #113	1.101304
Region #128	1.009600
Region #130	1.009000
Region #99	0.996238

Region # 174: Kaplan, 10-14, White Lion Street, Angel, Pentonville, London Borough of Islington, London, Greater London, England, N1 9PF, United Kingdom



Lastly we compare home and destination neighbourhoods side to side to show both their similarities and difference

Venue Category	Venue	New Venue
Burger Joint	Rosa's Burger, Beef Buddies	Five Guys, Chapel Market Burger Stall (The Nak...
Clothing Store	H&M, C&A	Monsoon, Next, French Connection, H&M, Joy, GA...
Drugstore	dm-drogerie markt, Rossmann	NaN
Event Space	La Redoute	Lift
Fish Market	Fischgeschäft Stuch	Moxon's Fish Monger
Flower Shop	Blumen aus Holland	Angel Flowers
French Restaurant	Ruby's Baguetterie	Le Coq Epicer, Frederick's Bar & Restaurant, C...
Hotel	Insel Hotel Bonn	DoubleTree by Hilton, Premier Inn London Angel...
Italian Restaurant	Terra Vino	Don Matteos, Dolcetto, Bella Italia, La Forche...
Metro Station	U Stadthalle	Angel London Underground Station, Thoughts Of ...
Park	Kurpark	Myddelton Square, Spa Green, Islington Green
Pizza Place	Zum Steinofen	Franco Manca
Shopping Mall	Fronhofer Galeria	Angel Central, Argos
Theater	Kleines Theater Bad Godesberg, Kammerspiele	Sadler's Wells, Old Red Lion Pub and Theatre, ...
Tunnel	Bad Godesberger Tunnel	Islington Tunnel
Video Store	Empire Videothek	NaN

Conclusion and future improvements

Current usage of the recommendation system:

- Saving time and efforts choosing a new place to live
- Having fun finding places similar to one's current neighbourhood

Further improvements:

- Adding adding new factors including
 - real estate price level,
 - ecological situation,
 - traffic situation...