DUBLIN'S HOMELESS ROAD

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Introduction and data acquisition

Finding the best route for increasing alms

- Homelessness is a major issue in Ireland, being much more acute in Dublin's area.
- Mr. Florin, a real homeless located in Dublin, is perceiving lately a decrease in alms.
- This project aims to help Mr. Florin to increase his income, by analyzing which are the places more convenient for him to be and come up with a weekly route that would optimize his income.
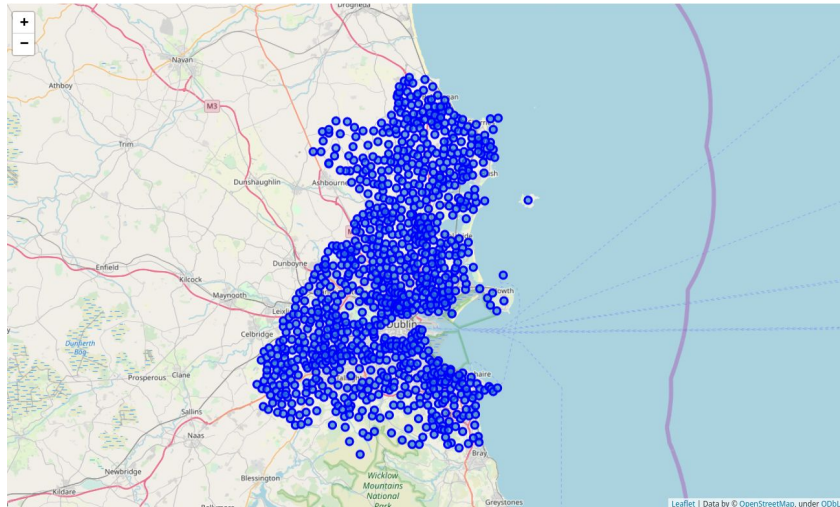- One of the requirements is that every day he has to move to a different place.

Data acquisition
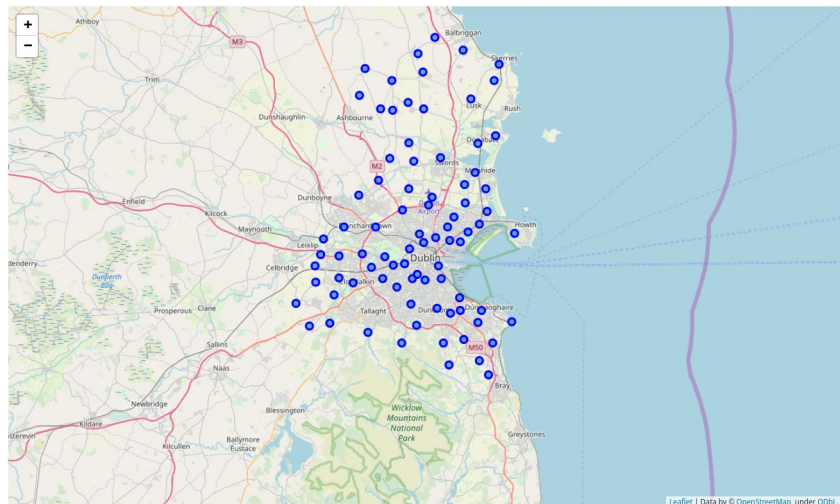
Data acquisition and cleaning

- There is a clear relationship between a location, its venues around, and the level of alms the population nearby are willing to provide.
- We would mainly need two types of data: Locations around Dublin and venues available
- For locations we will use https://www.townlands.ie and for venues Foursquare API https://foursquare.com
- Location raw dataset contains 61.076 townlands and 27 parameters for each townland. From that data, only Dublin area and 5 parameters are necessary. There are no null values in the dataset.
- Regarding location's venues, we only need 5 features for each one.

Methodology and exploratory data analysis

There are too many townlands in Dublin's area (Figure on top).

We will use Civil Parishes instead (figure on the bottom).

There are 2173 venues in Dublin locations

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Address	Venue Latitude	Venue Longitude	Venue Category
0	Aderrig	53.340213	-6.474632	Finnstown Castle Hotel	Newcastle Rd	53.339602	-6.460888	Hotel
1	Aderrig	53.340213	-6.474632	Adamstown Railway Station	Adamstown	53.337099	-6.462584	Train Station
2	Aderrig	53.340213	-6.474632	Peacock Restaurant	Ireland	53.339547	-6.461501	Gastropub
3	Aderrig	53.340213	-6.474632	Londis	Adamstown Ave	53.336752	-6.457966	Convenience Store
4	Aderrig	53.340213	-6.474632	PDM Construction	Airlie Heights	53.350451	-6.469920	Building

From the 83 locations previously filtered, we found 2173 venus within a radius of 1,5 km from each location.

There are 217 unique types of venues from the information obtained

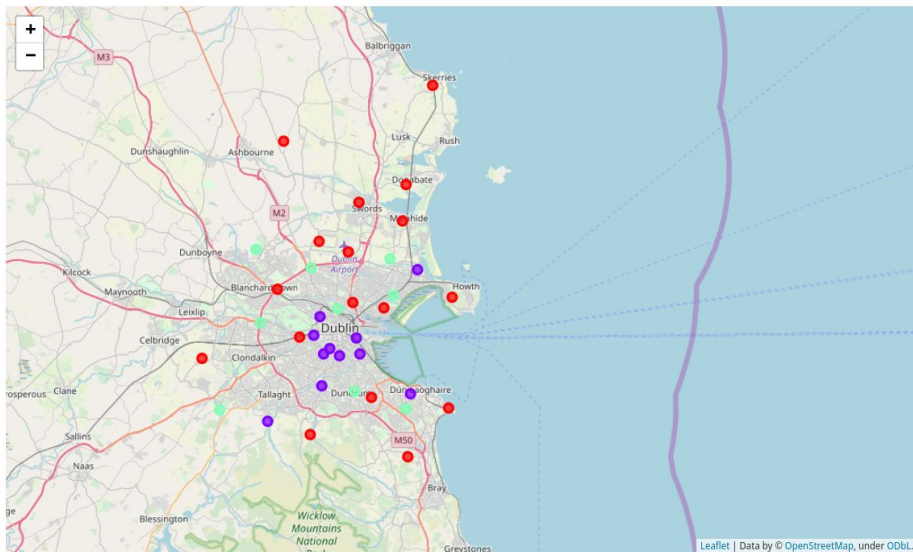List of predefined venues that provides the highest amounts of alms:

- Bakery
- Food & Drink Shop
- Pharmacy
- Betting Shop
- Scenic Lookout
- Ice Cream Shop
- Gourmet Shop
- Health Food Store
- Gift Shop
- Bookstore

Number of total venues per category

	Neighborhood	Bakery	Betting Shop	Bookstore	Food & Drink Shop	Gift Shop	Gourmet Shop	Health Food Store	Ice Cream Shop	Pharmacy	Scenic Lookout	Count_Venues	Total
37	NaN	15.0	2.0	6.0	15.0	4.0	6.0	4.0	6.0	12.0	7.0	59.0	77.0

Once we filter the data with the 10 venue category that provide the highest amounts of alms, we found that from the original 84 places analysed, only 37 of them contain at least one of the categories previously defined

	Neighborhood	Bakery	Betting Shop	Bookstore	Food & Drink Shop	Gift Shop	Gourmet Shop	Health Food Store	Ice Cream Shop	Pharmacy	Scenic Lookout	Count_Venues	Total
36	Taney	0	0	2	0	0	0	1	1	2	0	4	6
18	Monkstown	1	0	1	1	0	1	0	1	0	0	5	5
33	St. Peter's	0	0	0	3	0	0	1	1	0	0	3	5
9	Donnybrook	0	0	0	1	0	1	0	1	1	0	4	4
3	Cloghran	0	0	1	1	1	0	0	0	0	1	3	4
26	St Mark's	2	0	0	1	0	1	0	0	0	0	3	4
7	Dalkey	1	0	0	0	0	0	1	0	0	2	2	4

List of locations with the highest amount of predefined venues

Map with 37 locations grouped with unsupervised machine learning algorithm "KMeans"

Results and discussion

Groups identified

Group 1: Locations with low/medium number of venus, mixture types of venues

Group 2: Locations with medium/high number of venues, Food & Drink oriented

Group 3: Locations with low/high number of venus, Pharmacy oriented

Recommended route

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Day  1
Location:  Taney
Number of venues:  6
Location group:  Low/High number, Pharmacy
```

	Venue Category	Venue	Venue Address
72	Bookstore	Eason	Dundrum Town Centre (Level 3 Unit 12-14)
73	Pharmacy	Boots	Dundrum Town Centre (Unit 18 Level 2)
74	Ice Cream Shop	Aussie Ice	Dundrum Town Centre (Level 1 Unit 12a)
75	Health Food Store	The Health Store	Dundrum Town Centre (Level 3 Unit 15a)
76	Pharmacy	McCabes Pharmacy	Dundrum Town Centre (Level 3 Unit 17)
77	Bookstore	Hughes & Hughes Booksellers	Dundrum Town Centre

```
Day  2
Location:  Monkstown
Number of venues:  5
Location group:  Medium/High number, Food&Drink
```

	Venue Category	Venue	Venue Address
34	Food & Drink Shop	Salt @Avoca	11a Monkstown Crescent
35	Gourmet Shop	Avoca	11a The Crescent
36	Ice Cream Shop	Scrumdiddly's	Kelly's Avenue (Crofton Rd)
37	Bakery	The Natural Bakery	93 George's St Lwr
38	Bookstore	Eason	7 Marine Rd

Recommended route

```
Day  3
Location:  St. Peter's
Number of venues:  5
Location group:  Medium/High number, Food&Drink
```

	Venue Category	Venue	Venue Address
65	Food & Drink Shop	Fallon & Byrne	Dublin
66	Health Food Store	Urban Health	9 Fields Terrace
67	Food & Drink Shop	Best of Italy	Dunville Ave
68	Ice Cream Shop	Scoop	22 Sandford Rd, Ranelagh
69	Food & Drink Shop	Hopsack	Lwr Rathmines Rd

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Day  4
Location:  Donnybrook
Number of venues:  4
Location group:  Medium/High number, Food&Drink
```

	Venue Category	Venue	Venue Address
16	Food & Drink Shop	The Good Food Store	Serpentine Ave
17	Ice Cream Shop	Scoop	22 Sandford Rd, Ranelagh
18	Gourmet Shop	Lotts & Co	7 S Lotts Rd
19	Pharmacy	Boots	32 Uppr Baggot St

Recommended route

```
Day  5
Location:  Cloghran
Number of venues:  4
Location group:  Low/medium number, mixture venues
```

	Venue Category	Venue	Venue Address
4	Gift Shop	Irish Memories	Terminal 2 (DUB Airport)
5	Scenic Lookout	Airplane Watching Car Park	Old airport road
6	Food & Drink Shop	Caviar House & Prunier	Terminal 2 (Dublin Airport (DUB))
7	Bookstore	WHSmith	100 Gates, Terminal 1, Dublin Airport (DUB)

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Day  6
Location:  St Mark's
Number of venues:  4
Location group:  Medium/High number, Food&Drink
```

	Venue Category	Venue	Venue Address
48	Gourmet Shop	Lotts & Co	7 S Lotts Rd
49	Bakery	Il Valentino	5 Gallery Quay, Grand Canal Harbour
50	Food & Drink Shop	The Good Food Store	Serpentine Ave
51	Bakery	Bread 41	Pearse Street

Recommended route

```
Day  7
Location:  Dalkey
Number of venues:  4
Location group:  Low/medium number, mixture venues
```

	Venue Category	Venue	Venue Address
11	Scenic Lookout	Killiney Hill Park	Killiney Hill
12	Scenic Lookout	Dalkey Hill	Torca Rd
13	Bakery	Country Bake	35 Castle St
14	Health Food Store	Select Stores	Tubbermore Rd

Conclusion

Conclusions

- Homelessness problem should be a priority for society.
- We have obtained the necessary data for achieving the objective of the project, cleaned it, and get some good results out of it.
- We have implemented KMeans algorithms for obtaining 3 different groups of locations.
- We have obtained an optimized weekly route for increasing Mr. Florin income.
- Will someday machine learning resolve the homeless problem and help humans build a more equal and prosperous society?

Thanks for your attention