Moving to Las Vegas

Coursera IBM Data Science Capstone

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1. Introduction / Business problem

1.1 Scenario

I am currently living in Italy in a sparkling university town called Padova/Padua. I have plenty of venues and attractions especially parks for children, shopping venues for my wife and theatres for me. I got a job in Las Vegas and I am planning to relocate if I can find a place to live with similar venues.

1.2 Problem to be solved

I need to find a Las Vegas area with:

- similar venues
- availability of a single house with min 2 bedrooms, 2 bathrooms, a garage and a garden with swimming pool, no HOA fees, build after 2009 and a budget of $500k
- nearby primary, middle and high schools
- maximum distance from Caesars Palace Casino (job location): 10 miles

1. Introduction / Business problem

1.3 Potential audience

- This project can be useful for all those people that need to relocate with their families in the same country or in different countries or even continents.

- It can be useful for businesses that are planning to relocate and are considering their employees needs in the global balance of pros and cons.

- It can be adapted to the case of evaluating a new business opportunity in a certain area.

- Last, but not least, it can be useful for everyone interested in Data Science as a possible solution for a practical case.

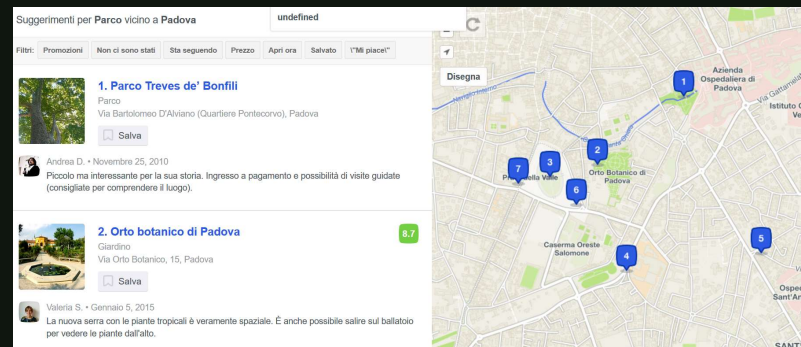# 2. Data

2.1 Data sources

- Geodata for Padova/Padua with venues (Nominatim or geocode, Foursquare and Folium)

- Geodata for Las Vegas neighborhoods including the surrounding cities of North Las Vegas and Henderson, plus the Census-designated places of Blue Diamond, Enterprise, Paradise, Spring Valley, Summerlin South, Sunrise Manor, Whitney and Winchester with venues (Wikipedia, Nominatim or geocode, Foursquare and Folium)

- List of houses to buy (zillow, Nominatim or geocode and Folium)

2. Data

2.2 Data features

- Padova/Padua
  - My location: latitudine and longitude (45.3959547,11.8802724)
  - Parks: from Foursquare with a specific radius of 1km

  - The same for schools, shopping venues, theatres (from Foursquare) and a specific radius of 1km.
  - The features we are interested are distance, review score, opening hours and if they are trending.

2. Data

- Las Vegas
  - Potential houses to buy (with latitude and longitude)
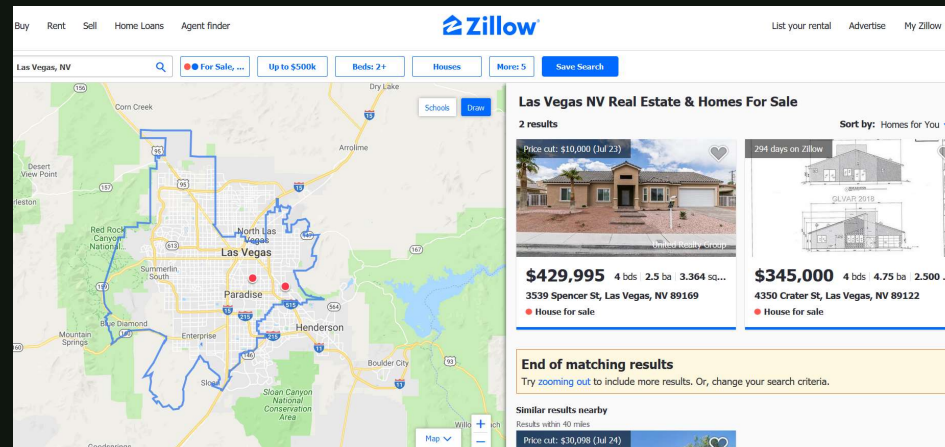
  - As for Padova/Padua, in Las Vegas we use foursquare with a radius of 1km.
  - So parks, schools, shopping venues, theatres (from Foursquare) and a specific radius of 1km.
  - The features we are interested are distance from house, review score, opening hours and if they are trending.
  - We consider also the distance of the house from the jobplace (Caesars Palace Casino Las Vegas).

3. Methodology

3.1 Strategy

The strategy is based on mapping the data described in section 2 in order to create a clear view of the options to make easy the choice of the best house in Las Vegas compared to current Padova/Padua home.

First the information will be imported, sorted, trasformed, clustered. Then a single map with all data classified in a clear manner will be created.

Now all the details of the potential houses, clusters of venues in the neighborhoods and job location will be clearly visibile in a single view (the map) with all the details required.

Moreover a measurement tool icon will be provided for user convenience.

The popus of the map items will display all details for every single cluster or house.

3. Methodology

3.2 Tools

First of all I used web-scraping tools to get unstructured data from websites (neighborhoods) and convert it in csv that were imported in dataframes with pandas libraries (read_csv)

After that I used Nominatim and Google APIs to get geodata for all neighborhoods, home, potential houses and job location.

I used Geopy and Nominatim to establish relative distances.

The maps were created with Folium.

The surrounding venues were obtained from Foursquare API using their categoryid to filter only the venues that I was interested in (parks, schools, shopping, arts and entertainment).

I used kmeans from SciKit-learn library to define clusters of the venues in the Las Vegas neighborhoods.

4. Results

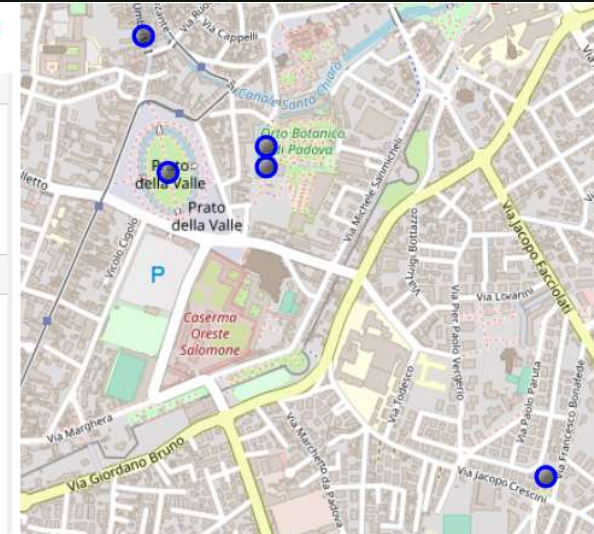## 4.1 Padova/Padua

Padova/Padua: Parks and Playgrounds   **Venues: 5**

```
PDnearby_venues['categories'].value_counts()

Other Great Outdoors    2
Park                    1
Garden                  1
Plaza                   1
Name: categories, dtype: int64
```

PDnearby_venues

	name	categories	lat	lng
0	Prato della Valle	Plaza	45.398420	11.876521
1	Orto Botanico (Orto botanico di Padova)	Garden	45.399007	11.879603
2	Centro Giovanile Antonianum	Other Great Outdoors	45.398539	11.879618
3	Giardini Santa Rita	Park	45.391702	11.888398
4	Via Umberto I	Other Great Outdoors	45.401423	11.875735

Padova/Padua: Schools   **Venues: 3**

PDnearby_venues2

	name	categories	lat	lng
0	Itis Ruzza	High School	45.399522	11.882700
1	Liceo Scientifico E. Fermi	High School	45.397916	11.873107
2	ITC Calvi	High School	45.401920	11.880880
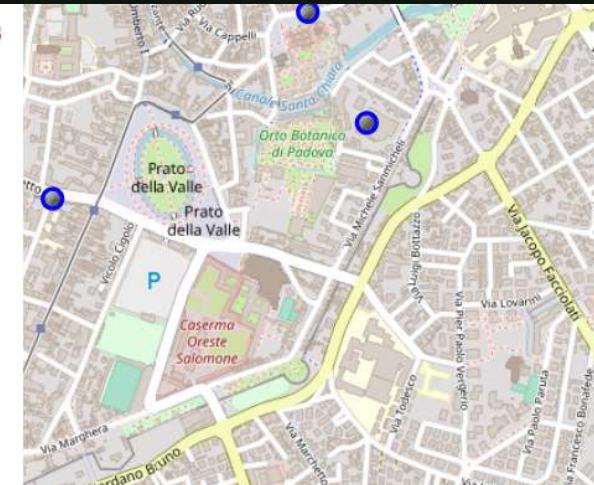
4. Results

Padova/Padua: Shopping venues   **Venues: 14**

PDnearby_venues3

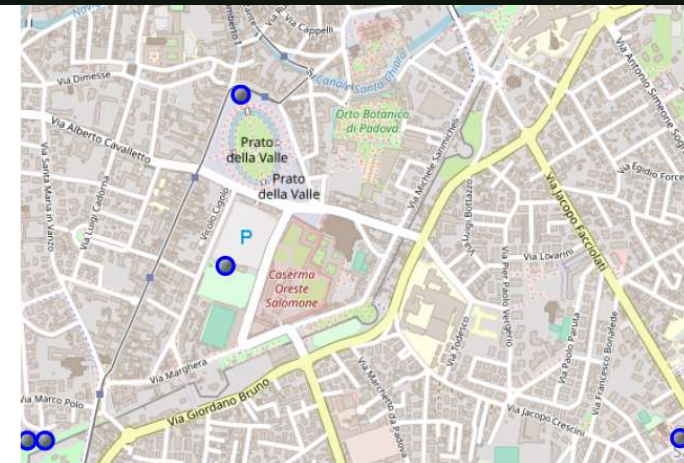|	name	categories	lat	lng
0	Mercato di Prato della Valle	Market	45.397334	11.876730
1	3Store	Mobile Phone Shop	45.389453	11.880090
2	Farmacia Ciato	Pharmacy	45.389220	11.880160
3	DESPAR Vergerio	Grocery Store	45.395713	11.885286
4	Gioielleria Cattelan	Jewelry Store	45.388406	11.880976
5	Bottega Angoli di Mondo Coop. Sociale	Thrift / Vintage Store	45.389103	11.875822
6	Europa in Prato	Food & Drink Shop	45.397989	11.875354
7	Calore Piante	Flower Shop	45.388128	11.884997
8	Pam Panorama	Supermarket	45.391990	11.871113
9	Drogheria Preti	Liquor Store	45.399604	11.876897
10	Mercato Antiquariato Prato Della Valle	Flea Market	45.399544	11.875821
11	Conad City	Supermarket	45.393849	11.890307
12	Despar	Food & Drink Shop	45.399133	11.872046
13	Sara Assicurazioni - Agenzia di Padova Sud	Insurance Office	45.399148	11.871606
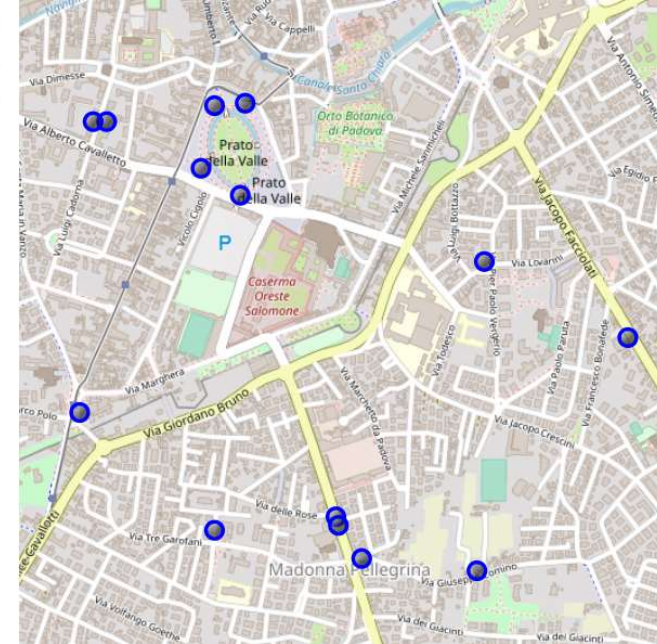
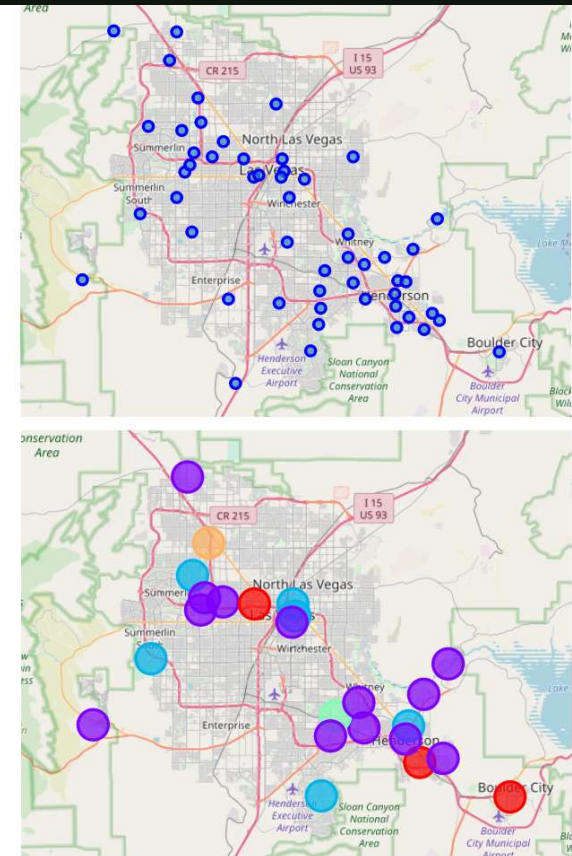**Padova/Padua: Arts and Entertainment**   **Venues: 5**

PDnearby_venues4

	name	categories	lat	lng
0	Cinema Lux	Movie Theater	45.395431	11.875456
1	Museo Del Precinema Palazzo Angeli	Museum	45.399790	11.875993
2	Giardini Sospesi	Concert Hall	45.390996	11.868909
3	Bastione Alicorno	Performing Arts Venue	45.391014	11.868284
4	Cinema Rex	Movie Theater	45.391082	11.891885

4. Results

4.2 Las Vegas – Neighbordhoods and clusters of venues

4. Results

4.3 Las Vegas Houses – Geodata and comparison with Padova home

```python
lvhouses = pd.read_csv("LV_Houses.csv",sep=';')
lvhouses.head()
```

	ID_House	Address	Latitude	Longitude	Bds	Ba	sqft	Price	Job distance (mi)
0	1	3539 Spencer St., Las Vegas, NV 89169	36.125213	-115.130470	4	3	3364	429995	3,6
1	2	4530 Crater St., Las Vegas, NV 89122	36.109992	-115.058833	4	5	2500	345000	7,1
2	3	8576 Hogan Falls Cir., Las Vegas, NV 89123	36.033679	-115.125374	3	3	2981	519900	8

	Parks	Schools	Shopping	Arts and ent.
Padova/Padua Home	5	3	14	5
House #1	0	3	100	9
House #2	3	3	80	6
House #3	1	0	27	4

Price cut: $10,000 (Jul 23)
United Realty Group
$429,995 4 bds | 2.5 ba | 3.364 sq...
3539 Spencer St, Las Vegas, NV 89169
● House for sale

294 days on Zillow
GLVAR 2018
$345,000 4 bds | 4.75 ba | 2.500 ...
4350 Crater St, Las Vegas, NV 89122
● House for sale

Price cut: $30,098 (Jul 24)
Orange Realty Group L...
$519,900 3 bds | 3 ba | 2.981 sqft
8576 Hogan Falls Cir, Las Vegas, NV 89123
● House for sale

4. Results

4.4 Las Vegas – Cluster 1 (best choice for me from analysis)

```
## cn is the cluster number to explore
cn = 1
lv_merged.loc[lv_merged['Cluster Labels'] == cn, lv_merged.columns[[1] + list(range(5, lv_merged.shape[1]))]]
```

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Blue Diamond	Skate Park	Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
5	Calico Ridge	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
8	Gibson Springs	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
11	Green Valley South	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
13	Lake Las Vegas	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
20	River Mountain	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
21	Townsite	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
23	Whitney Ranch	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
25	Buffalo	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
27	Charleston Heights	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
31	Huntridge	Park	Non-Profit	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	History Museum	Health & Beauty Service	Funeral Home
36	Pioneer Park	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home
42	Tule Springs	Park	Skate Park	Residential Building (Apartment / Condo)	Real Estate Office	Playground	Other Great Outdoors	Non-Profit	History Museum	Health & Beauty Service	Funeral Home

4. Results

4.5 Las Vegas Decision Map – Houses to buy (blue dots), Job location (green dot) and Venue Clusters (bubbles)
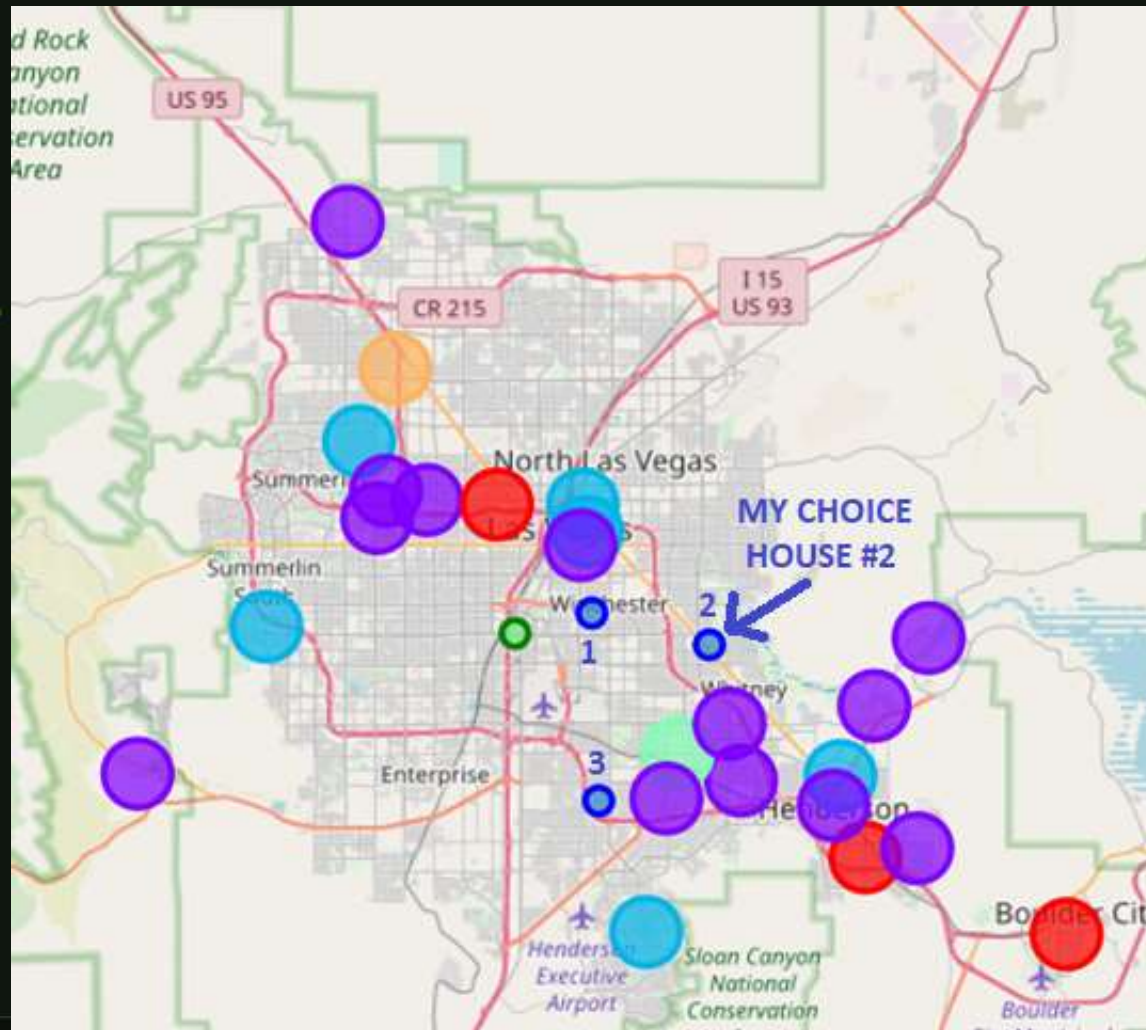
5. Discussion

5.1 House Selection

I used the above map to evaluate the different potential houses to buy.

- House #1: the price USD429,995 is on the budget and it is only 3.6mi from job location (15 min). There are no parks, but both elementary and middle schools. From parents point of view (pov) there are plenty of shopping and arts and entertainment venues.

- House #2: the price USD345,000 is pretty low and much bigger than House #1, it is 7.1mi from job location but around the same time(19 min). There are 3 parks, but only elementary schools. From parents pov there are plenty of shopping venues and average arts and entertainment venues.

5. Discussion

- House #3: the price USD519,900 is just a little bit over budget and around the same size like House #1. Distance from job location is 8mi but around the same time (18 min). There is 1 park and no schools nearby. Moreover not so many shopping and arts and entertainment venues.

- The venues for all houses are as of Cluster 1 so no real difference.

- House #3 is immediately out because an higher price tag gives less comfort and venues.
  House #2 is comparable to House #1 even somehow better and the price tag is much lower so it is my favourite choice.

- Comparing House #2 with Padova/Padua venues, Padova/Padua has more parks and playgrounds, some high schools but no elementary or middle schools around and the same level of arts and entertainment. Shopping venues are less that in House #2 area.

6. Conclusions

I can conclude that venues in House #2 area are pretty much the same like in my Padova/Padua home area even more shopping venues for my wife happiness. It is not far from job location and in a good neighborhood.
House #2 is a perfect fit for me and my family.

294 days on Zillow

GLVAR 2018

$345,000 4 bds | 4.75 ba | 2.500 ...

4350 Crater St, Las Vegas, NV 89122

● House for sale