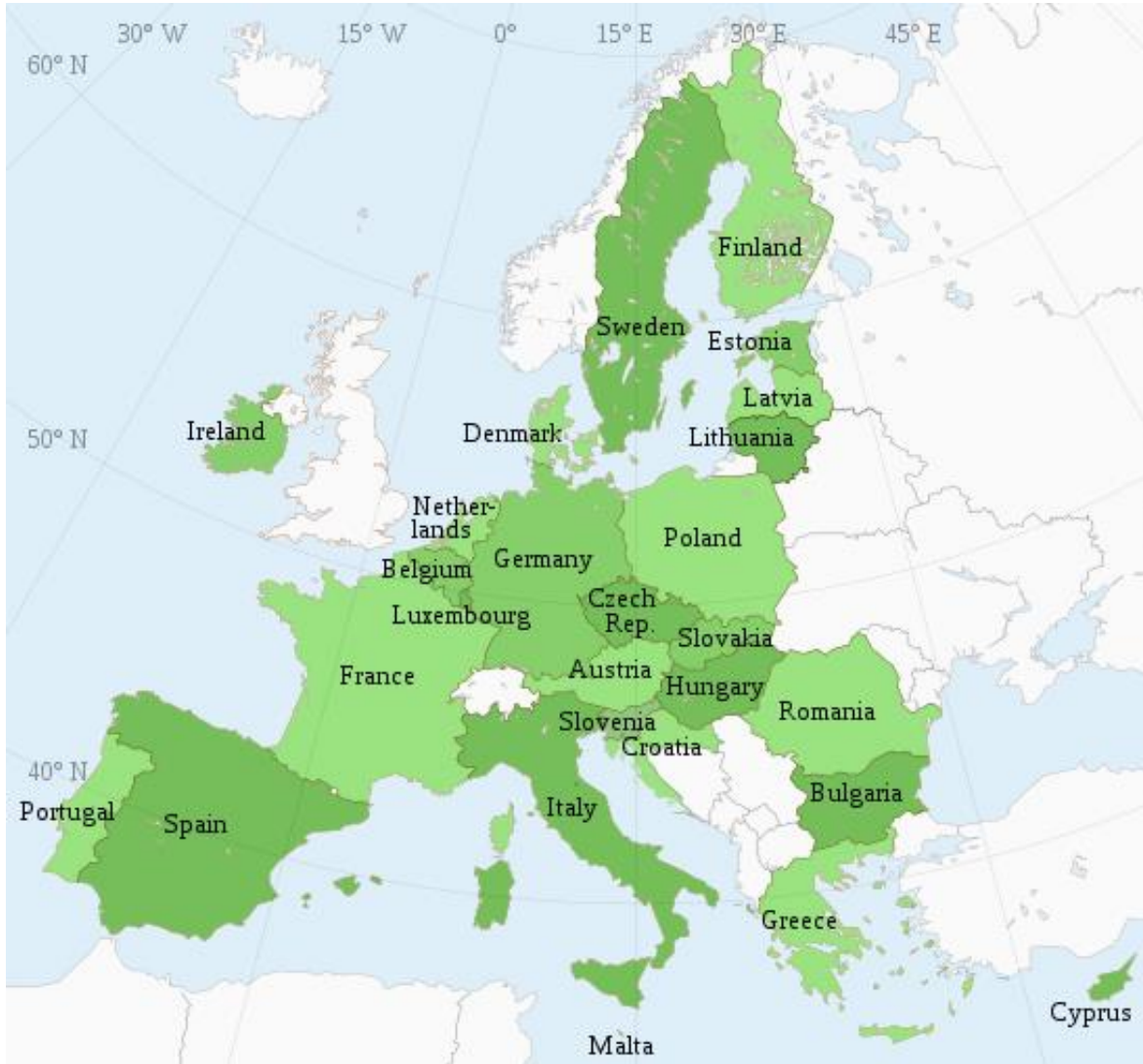




European Union (EU): Diversity and Business Opportunities

Capstone Project
Week 5

European Union (EU)



- A unique economic and political entity
- The predecessor, European Economic Community (EEC), was created in 1958 after the Second World War
 - For increasing economic cooperation between six countries: Belgium, Germany, France, Italy, Luxembourg and the Netherlands
- Consists of 27 EU countries
- The Schengen Area
 - Area without internal borders for citizens, many non-EU nationals, business people and tourists can freely travel without being subjected to border checks
 - The free movement creates more business opportunities as well as diversity in population

Aims

- **Aim 1:** To analyze city data including venues to evaluate similarities and/or dissimilarities between the cities within EU countries
 - A collection of 93 cities are used in the analysis
- **Aim 2:** To evaluate venue data of a selected city. To determine a suitable area to open a restaurant

Aim 1 will help understand the diversity within European countries while the Aim 2 will help making informed decisions in one of the business opportunity: Cuisine

This project can be useful for business owners and entrepreneurs who are looking to invest in the restaurant industry within the European Union.

The main objective of this project is to analyze appropriate data and to provide recommendations for the stakeholders.

Data Acquisition and Cleaning

- European city and demographic data was scraped from the web
- Data wrangling was used to create clean Pandas data frames for European countries and cities data

Sources:

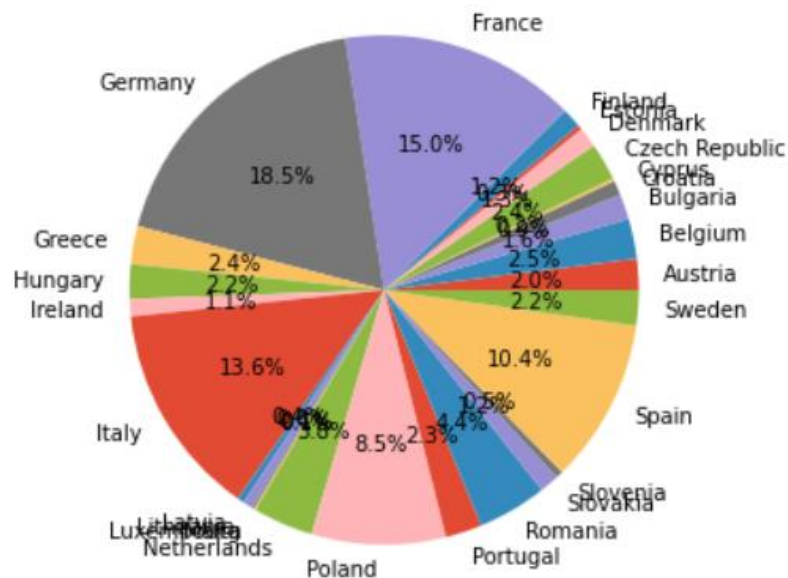
https://en.wikipedia.org/wiki/Demographics_of_the_European_Union#Ethnic_composition (Accessed 20th November, 2020)

(https://en.wikipedia.org/wiki/List_of_cities_in_the_European_Union_by_population_within_city_limits) (Accessed 20th November, 2020)

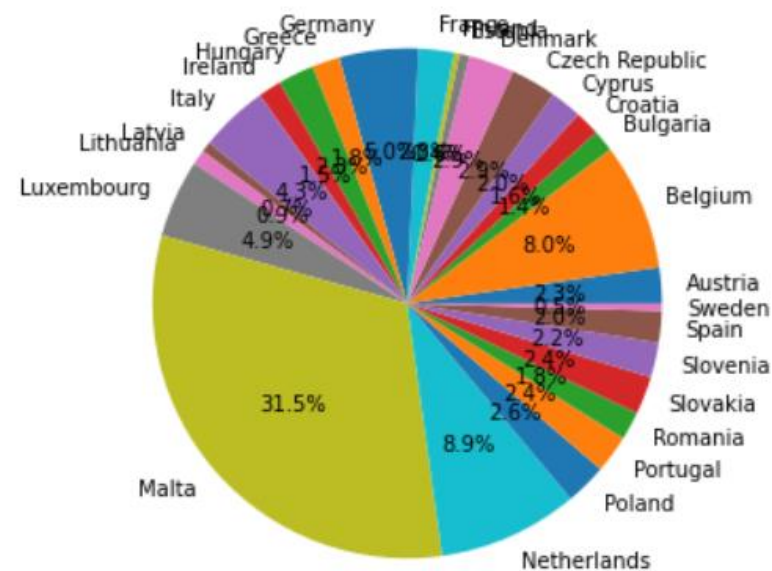
https://en.wikipedia.org/wiki/Demographics_of_the_European_Union#Population_by_country (Accessed 20th November, 2020)

Population in EU Countries

Population



Population Density



Germany has the highest population whereas Malta has the highest population density

Top 5 Net Immigration % in EU Countries

Country	Pop_Growth_Pct	Nat_Growth_Pct	Net_Migr_Pct
Malta	36.8	1.6	35.3
Luxembourg	19.6	3.2	16.3
Cyprus	13.4	4.1	9.3
Ireland	15.2	6.2	9.0
Sweden	10.8	2.3	8.5

Pop_Growth_Pct = % Population Growth

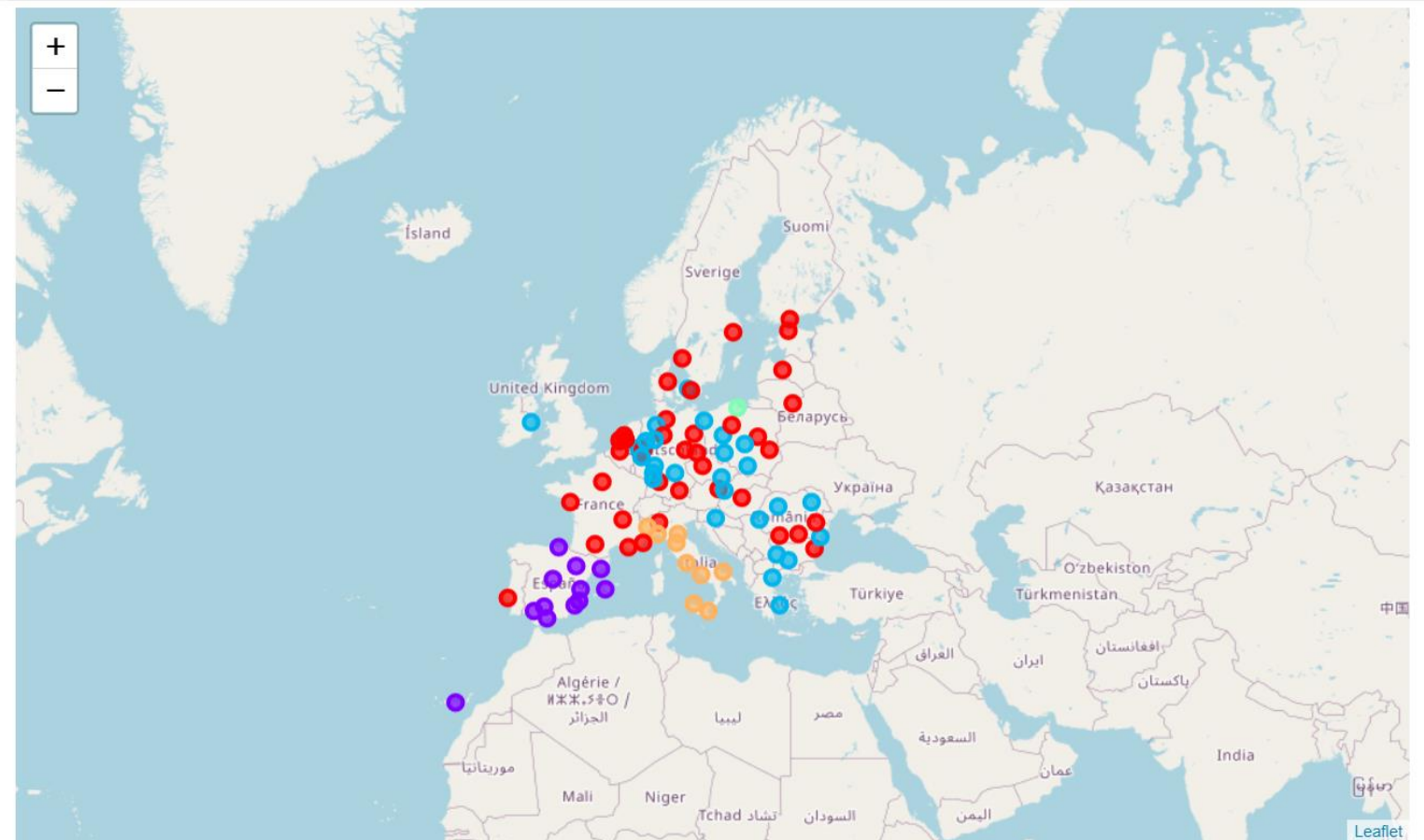
Nat_Growth_Pct = % Natural Growth

Net_Migr_Pct% Net Migration

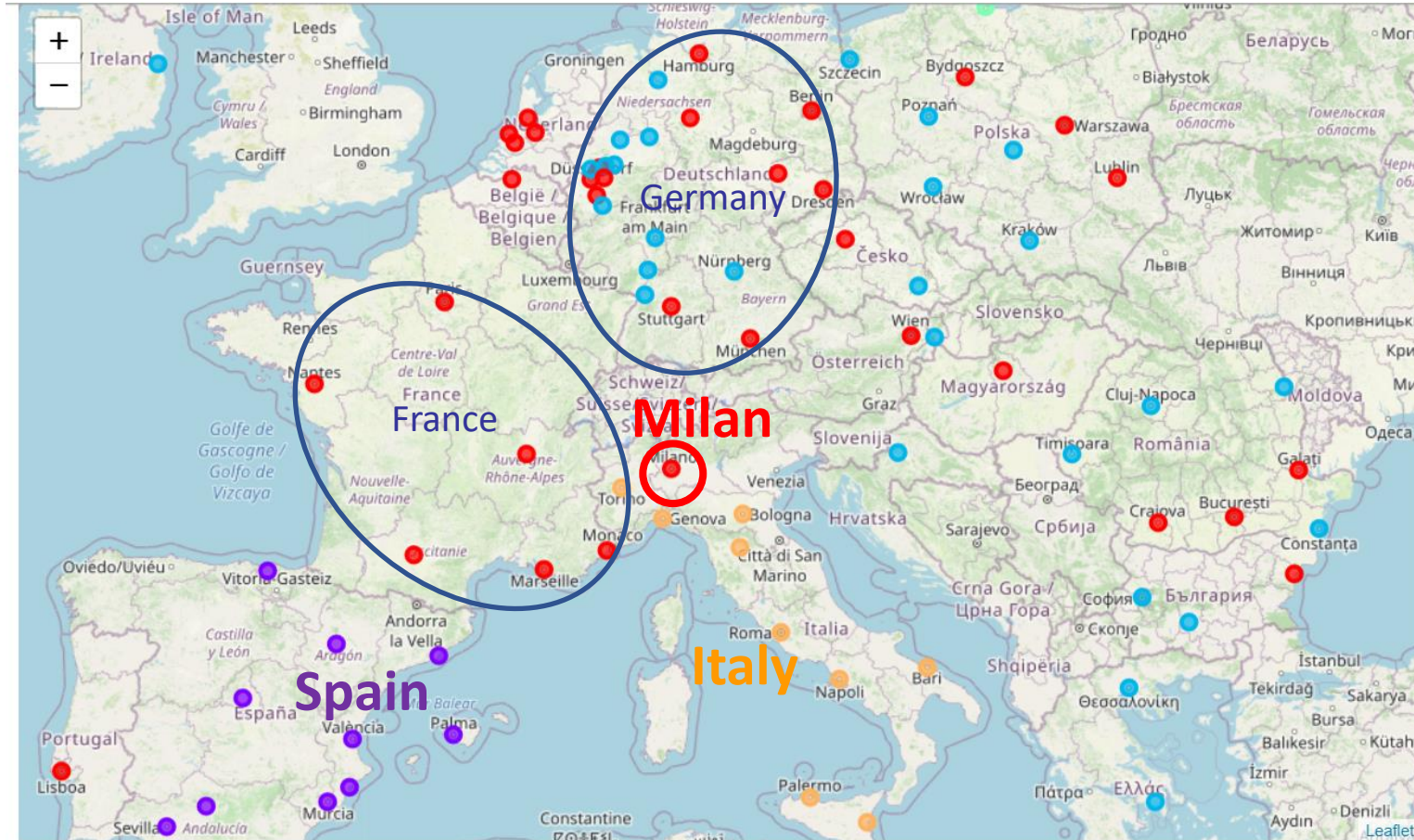
Net population growth was impacted by net immigration rate in some countries such as Malta (35.3%), Luxemburg (16.3%), Ireland (9.0%), and Sweden (8.5%)

Similarities and Differences in EU Cities (Based on Venues)

- K-means cluster analysis showed 5 clusters of cities
- Remarkable findings:
 - Some countries have clustered separately: *Spain, Italy, a city in Poland*
 - Italian cities clustered together with one exception: *Milan*

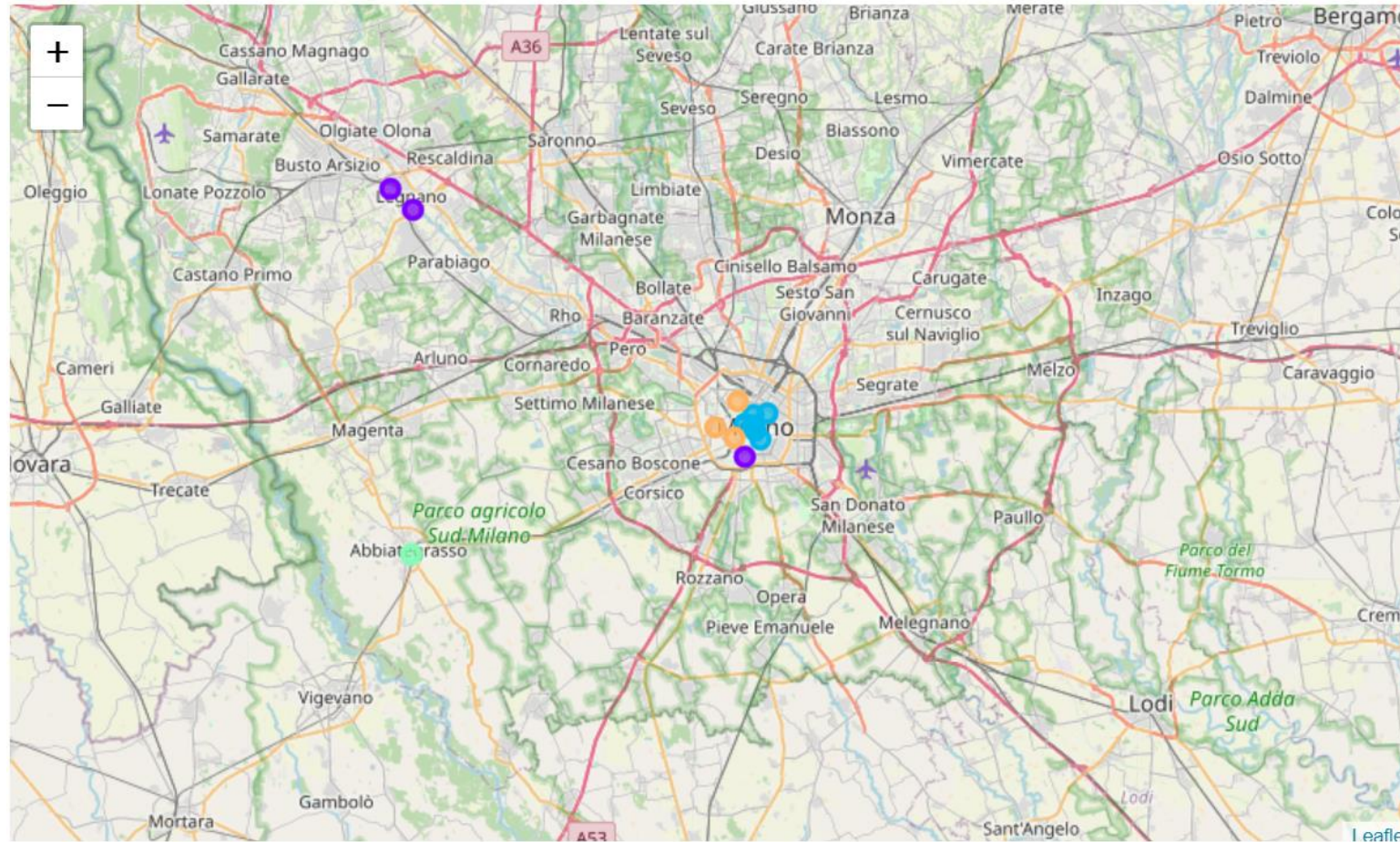


Clustering of Cities in the Same Country (Based on Venues), Expanded View



Certain countries have cities clustered together whereas others have cities clustered separate.

Milan: Clustering Based on Venues



K-means cluster analysis showed 5 clusters of districts in Milan.

Clusters 1-2

- **Cluster 1:** Buenos Aires has 2 restaurants amongst the ten most common venues (4% frequency for restaurants amongst top 5 venues).
- **Cluster 2:** Corso Magenta has 2 restaurants amongst the ten most common venues (7% frequency for restaurants amongst top 5 venues).
- Ticinese has 4 restaurants amongst the ten most common venues (9% frequency for restaurants amongst top 5 venues).
- Torino has 2 restaurants in the ten most common venues (15% frequency for restaurants amongst top 5 venues).

Cluster 3

- Cluster 3: Brera has 3 restaurants and a hotel amongst the ten most common venues (13% frequency for restaurants amongst top 5 venues).
- Castello has 1 restaurant and a hotel amongst the ten most common venues (10% frequency for restaurants amongst top 5 venues).
- Duomo has 1 restaurant and a hotel amongst the ten most common venues (8% frequency for restaurants amongst top 5 venues).
- Giardini has 1 restaurant and a hotel amongst the ten most common venues (6% frequency for restaurants amongst top 5 venues).
- La Scala has 1 restaurant and a hotel amongst the ten most common venues (7% frequency for restaurants amongst top 5 venues).

Cluster 3 Contd...

- Università has 1 restaurant and a hotel amongst the ten most common venues (6% frequency for restaurants amongst top 5 venues).
- Vittorio Emanuele has 1 restaurant and a hotel amongst the ten most common venues (8% frequency for restaurants amongst top 5 venues).

Clusters 4-5

- **Cluster 4:** Monte Napoleone has 2 restaurants amongst the ten most common venues (0% frequency for restaurants amongst top 5 venues).
- **Cluster 5:** Sant'Ambrogio has 2 restaurants and a hotel amongst the ten most common venues (19% frequency for restaurants amongst top 5 venues).
- Paolo Sarpi has 5 restaurants and a hotel amongst the ten most common venues (27% frequency for restaurants amongst top 5 venues).
- Corso Vercelli has 3 restaurants amongst the ten most common venues (7% frequency for restaurants amongst top 5 venues).

Conclusions

Population in EU is diverse

Some countries are higher in population density

Immigration has a significant effect on countries' population

Immigration will also benefit diversified cuisine types

Milan is different than other cities studied based on venues

Milan found 5 different clusters of districts based on the venues compared to other districts

Milan's Monte Napoleone, Buenos Aires, Giardini districts are better locations to open a restaurant. It is recommended to open a restaurant with non-Italian cuisine such as French or Spanish cuisine

Future studies will be needed to perform a grid search to find restaurant density. Restaurant density will be used - to determine the best place to establish a restaurant.