Determination of Community Type

(based on demographic data for Miami-Dade County, FL)

Alexey D. Nechaev
Ph.D. in Law, L.L.M., M. Econ, M. Acc

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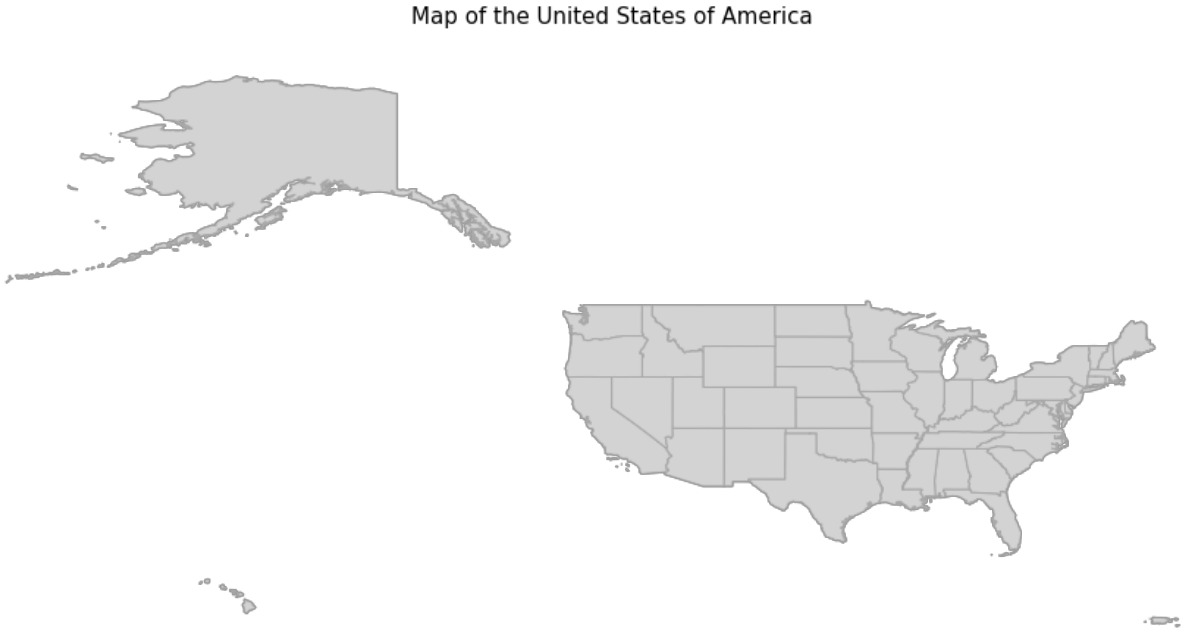
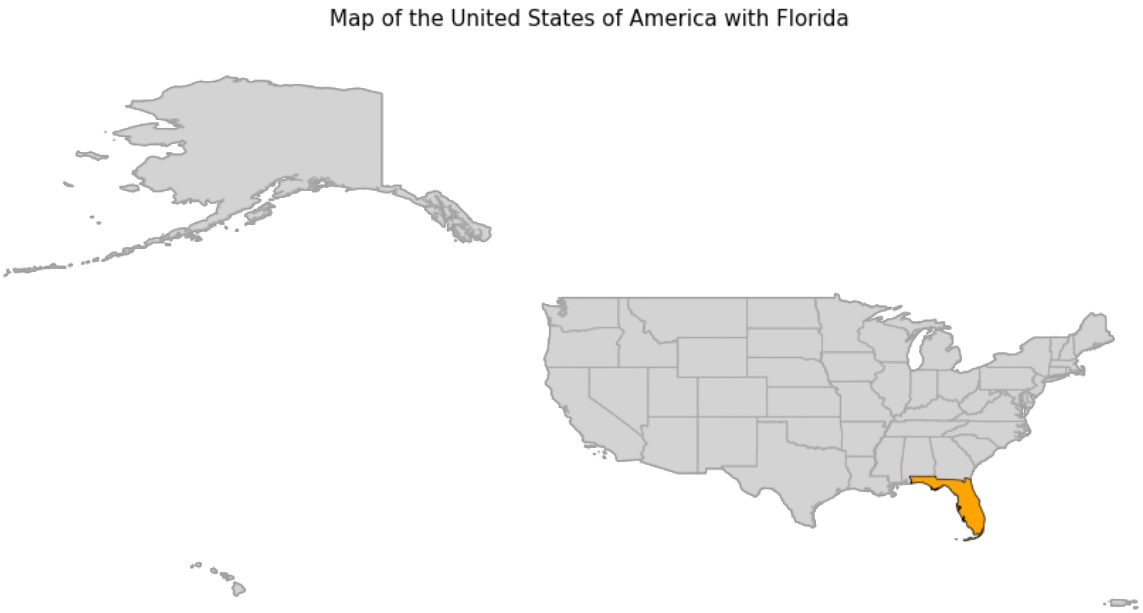
1. Introduction

1.1. Background

Local government in the US have at least two tiers of local government (counties and municipalities) below the level of the state. The types of municipalities vary from state to state. The United States consists of 50 states, a federal district, five major territories, and various minor islands.

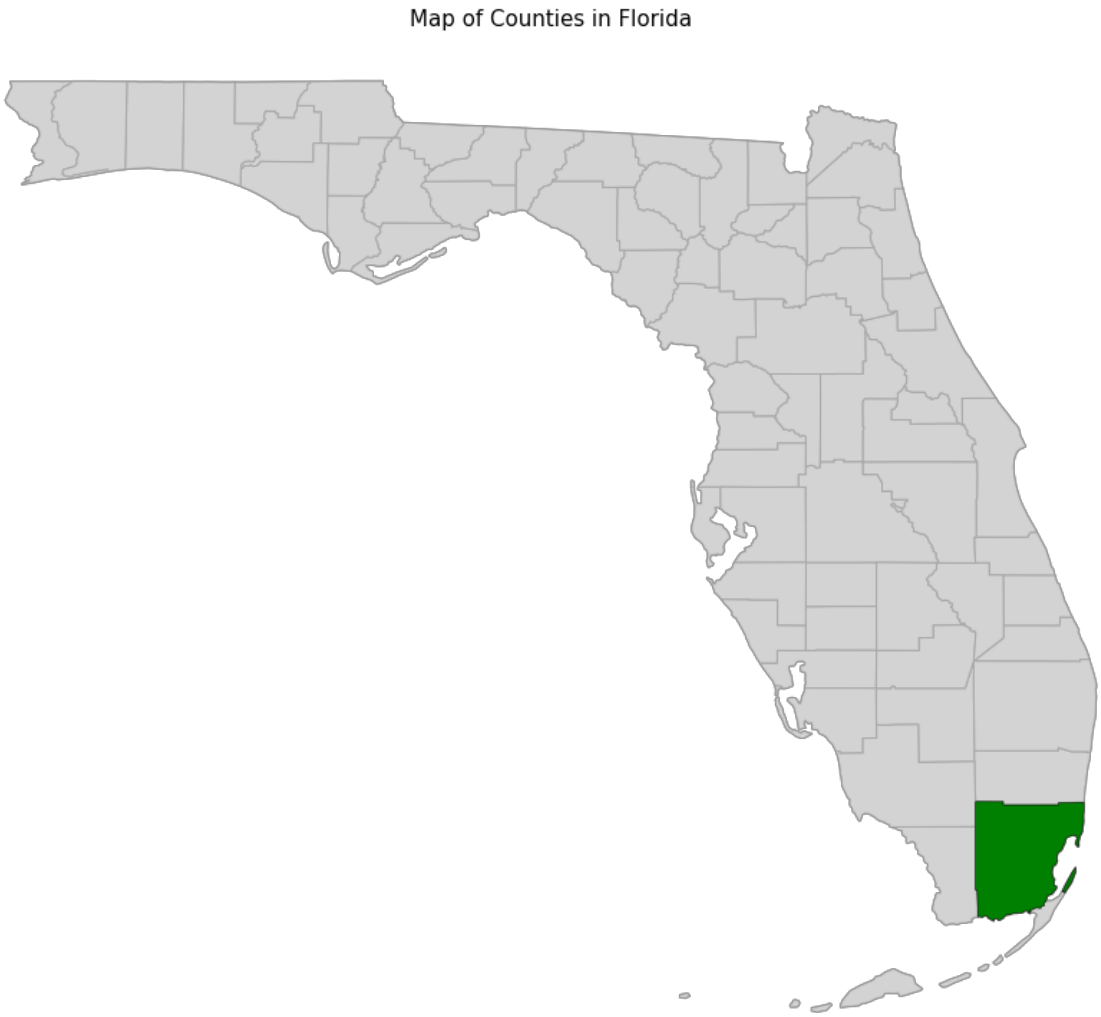


Florida is the 27th state and the southernmost state in the US.



According to Article VIII of the Constitution of the State Florida local governments in Florida are represented by the following types: counties and municipalities.

The State of Florida consists of 67 counties. Miami-Dade County is one of the counties of the State of Florida. It's situated in the southeastern part of Florida.

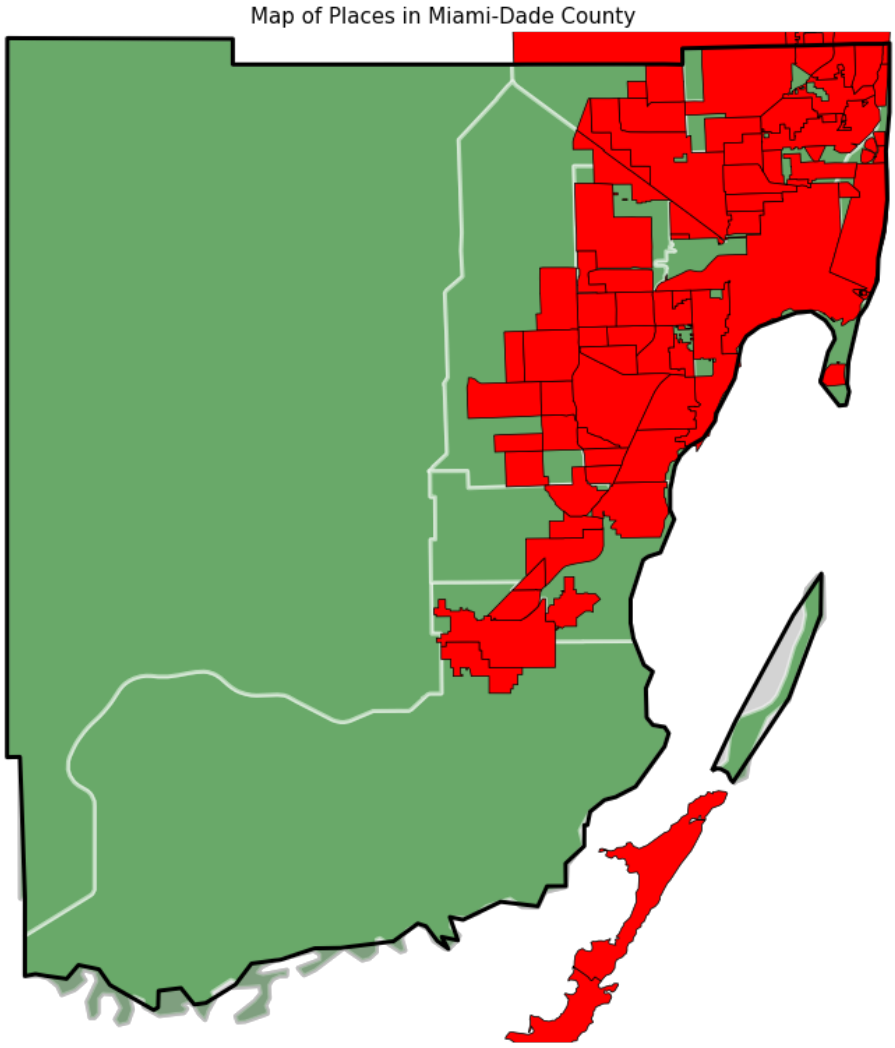


Municipalities in Florida are cities, towns and villages. However, there is no any legal distinction between these definitions.

There are 34 incorporated municipalities in Miami-Dade County, including cities, towns and villages. It's known that there are 19 cities, 6 towns and 9 villages in Miami-Dade County.

Moreover, there are a lot of Census-designed places (CDP). Census-designed places are delineated to provide data for population that are not legally

incorporated under the laws of the State. According to the 2010 United States Census there are 37 CDPs in Miami-Dade County.
Municipalities and CDPs can be defined as communities (or places). The first ones are incorporated but the seconds are not corporate entities.
All communities in Miami-Dade County are presented on the map below in the black border of the County.



1.2. Problems

These observation in the background part of introduction lead us to the next problems:

- could the administrative division in Miami-Dade County be described aa optimal?
- what type of municipality should be assigned to already existed incorporated communities and to CDPs (if they would be incorporated)?

- how could be changed the administrative division in Miami-Dade County?

The project aims to predict whether and how the types of communities should be distributed in Miami-Dade County.

1.3. Scope of Interest

On the one hand, the results of this project would be of interest to Miami-Dade County officials in prediction of further development of the county, including projecting of urbanization processes. On the other hand, it could be of interest to other specialists in the field of municipality and regional policy. It becomes more important due to the future results of CENSUS 2020.

2. Data

2.1. Literature Review on Demographic Data

As it was mentioned above according to the Florida law there is no certain legal criterion to distinguish cities, towns and villages. It's not the unique problem of Florida or even the US.

The executive director of the Wisconsin League of Municipalities D. Thompson pointed out that in Wisconsin "there are towns that operate like villages, villages that operate like towns, unincorporated villages that are actually towns and no real distinction between villages and cities"[1].

However, most of specialists in the local government development believe that the size is one of the features.

Population and housing size. The spokeswoman of the Colorado Municipal League S. Werner confirmed that "a town has a population of 2,000 or fewer; a city has a population of more than 2,000"[2] **.**National Geographic consider that "a town is generally larger than a village, but smaller than a city. Some geographers further define a town as having 2,500 to 20,000 residents". M.Rosenberg assumes that "villages are smaller than towns and towns are smaller than cities, though this is not always the case"[3] He provides us with some examples of minimum population to determine community as a city: 200 residents (Sweden, Denmark), 1,000 residents (Canada), 2,000 residents (France, Israel), 2,500 (Mexico), 50,000 (Japan). Some researchers are focusing on number of **housing units** as a criterion.

[1] https://lacrossetribune.com/town-village-city-what-s-the-difference/article_3ae0c206-d3e6-11e2-a6d7-001a4bcf887a.html

[2] https://www.timescall.com/2019/10/20/johnnie-st-vrain-whats-the-difference-between-a-city-and-a-town/

[3] https://www.thoughtco.com/difference-between-a-city-and-a-town-4069700#citation-2

Area size. E.E.Lampard conclude that a city, is "a relatively permanent and highly organized center of population, of greater size or importance than a town or village"[4]

Age distribution. Information that villages could be for older people and the young people go for cities[5] gives us the criterion "age distribution".

Racial diversity. The big cities could have more racial diversity than smaller towns and villages[6].

2.2. Data limitations

Based on the literature review we choose 5 main factors (population, area, housing units, age and race) for further determination of type of municipality and CDP's. Most of these factors have demographical nature. However, it would be inaccurate to consider that only demographic factors influence on type of municipality. There are plenty of social factors as location of production, labor division, transportation system efficiency, cultural environment, medical service and so on. This project is concentrated only on demographical features of communities according to CENSUS 2010. It's an important limitation that should be taken into account.

2.3. Other Data

In this project we also use a lot of data about location of communities, their borders and central points.

2.4. Data Sources

Most parts of data processed in this research are accumulated by CENSUS Bureau on their website https://www.census.gov/. Some of data (for instance, about location) can be received by in-built Python libraries. To find out the place of new city, town or village hall (the administrative centers of merged communities) we will use FourSquare API.

[4] https://www.britannica.com/topic/city

[5] https://news.ufl.edu/articles/2015/09/should-older-americans-live-in-places-segregated-from-the-young.html
https://www.thetimes.co.uk/article/villages-growing-older-as-young-head-for-the-cities-cvmdl3kk9

[6] https://theconversation.com/diversity-is-on-the-rise-in-urban-and-rural-communities-and-its-here-to-stay-69095

3. Methodology

In the research we use the following methods:
- data collection – public records, Foursquare queries;
- data preprocessing – methods of data cleansing, data editing, data reduction and data wrangling;
- data understanding – exploratory data analysis, ;
- modelling – clustering (K-means clustering and Hierarchical Clustering);
- evaluation – observation, comparison.

The problem that we are trying to solve in this research has the aim to find the structure of data, to group objects based on the similarity to one group of objects and dissimilarity to another. We will use K-means clustering for rearrangement of types of communities and Hierarchical clustering for find optimal merging of communities.

In this research we use Python for achieving our goals.

The example of data from Public Records:

	GEOID	CommunityName	Population	HousingUnits	Area
0	1590000US1208602681	Aventura city	35762	26120	3.51
1	1590000US1208603275	Bal Harbour village	2513	2780	0.65
2	1590000US1208603975	Bay Harbor Islands town	5628	3199	0.53
3	1590000US1208606600	Biscayne Park village	3055	1324	0.63
4	1590000US1208609000	Brownsville CDP	15313	5797	2.28

The example of data from Foursquare:

	name	location.city	location.lat	location.lng
0	Whole Foods	Miami	25.772000	-80.189146
1	Whole Foods	Miami Beach	25.780996	-80.141278
2	Whole Foods	Aventura	25.971296	-80.141222
3	Whole Foods	Aventura	25.969850	-80.144040
4	Whole Foods	North Miami	25.887963	-80.165049