

# Proyecto Final Capstone - La Batalla de los Vecindarios

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## 1. Introducción

Para este proyecto nos centraremos en analizar y visualizar, los barrios de la ciudad de **Medellin-Colombia**, para determinar cual lugar es mejor para abrir una **pizzería**.

Utilizaremos un set de herramientas de ciencia de datos, para manipular la data, obtener datos geoespaciales y segmentar los barrios.

Este proyecto en particular, esta enfocado en un negocio de pizzería, pero puede ser perfectamente aplicable a cualquier otro negocio.

## 2. Problema Comercial

Un amigo cercano desea abrir un local de comida, específicamente una pizzería, pero no tiene idea de en que lugar seria mas propicio abrir este local, en este emprendimiento tiene puesto sus esfuerzos y ahorros, es de vital importancia escoger bien el lugar donde estará la pizzería. Con la ayuda de la ciencia de datos, podemos darle un panorama claro, de donde es factible abrir la pizzería y donde no lo es.

## 3. Datos

### 3.1. Fuentes de Datos

Los datos que vamos a utilizar, provienen de varias fuentes, una de ella es la base de datos proporcionada por la alcaldía de **Medellín**, donde se encuentran todos los barrios de medellin, la comuna a la que pertenecen, (parecido a los distritos en otras ciudades) y si son urbanos o rurales. Estos datos pueden ser consultados en este enlace: [FuenteDatos](#).

Tenemos la opción de hacer web scraping, con el paquete **BeautifulSoup**, que utilizamos en los laboratorios anteriores, o tambien podemos descargar el archivo en formato **.csv**, directamente desde la pagina de la alcaldía de Medellin. y cargarlo a nuestro Notebook, con Pandas. Escogeremos esta opción por simplicidad.

Utilizaremos la librería **GeoPy**, para recuperar los datos Geoespaciales de cada uno de los barrios de la ciudad y los combinaremos en una sola tabla.

Ademas utilizaremos los datos de la Api **FourSquare**, para recuperar lugares y calificaciones, de los negocios similares, para los que deseamos predecir las mejores ubicaciones.

### 3.2. Data Cleaning

Como los Datos provienen de varias fuentes es posible, que halla datos faltantes o nulos, decidí eliminar estos datos de nuestro DataFrame principal, al igual que solo trabajaremos con los barrios que sean catalogados como **Urbanos**, y eliminaremos los que aparecen como rurales.

## Importar librerías

```
In [1]: import numpy as np # Librería para manejar datos vectorizados
import pandas as pd # Librería para análisis de datos
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)

import json # Librería para manejar archivos JSON

import requests # Librería para manejar solicitudes
from pandas.io.json import json_normalize # Librería para convertir un archivo json

# Matplotlib y módulos asociados para graficar
import matplotlib.cm as cm
import matplotlib.colors as colors

# importar k-means desde La fase de agrupación
from sklearn.cluster import KMeans

!conda install -c conda-forge folium=0.5.0 --yes
import folium # Librería para graficar mapas

print('Libraries imported.')

Collecting package metadata (current_repodata.json): ...working... done
Solving environment: ...working... done

# All requested packages already installed.

Libraries imported.
```

## Cargamos el conjunto de datos de los barrios de Medellin.

```
In [2]: dfBarrios = pd.read_csv('C:/Users/andrey.zapata/Downloads/Barrio_Vereda.csv')
dfBarrios.head(5)
```

	OBJECTID	CODIGO	NOMBRE	SUBTIPO_BARRIOVEREDA	NOMBRE_COMUNA_CORREGIMIENTO
0	1112	0510	Tricentenario	1	Castilla
1	1113	0208	Villa Niza	1	Santa Cruz
2	1114	1108	Laureles	1	Laureles Estadio
3	1115	1303	Santa Rosa de Lima	1	San Javier
4	1116	1206	Santa Lucía	1	La América

In [3]: # Eliminamos las columnas SHAPEAREA, SHAPELEN, OBJECTID Y CODIGO ya que nos las utiliza  
dfBarrios=dfBarrios.drop(['OBJECTID','CODIGO', 'SHAPEAREA', 'SHAPELEN'],axis=1)

Eliminamos los barrios que estan catalogados como **Rurales** y los barrios que no tienen nombre, o GeoPy no puede encontrar su datos Geoespaciales

In [4]: indexNames = dfBarrios[ (dfBarrios['SUBTIPO\_BARRIOVEREDA'] == 2) | (dfBarrios['NOMBRE'] == "Hospital San Vicente de Paúl") | (dfBarrios['NOMBRE'] == "Área de Expansión El Noral") | (dfBarrios['NOMBRE'] == "Facultad de Minas") | (dfBarrios['NOMBRE'] == "Facultad Veterinaria y Zootecnia U.de.A.") | (dfBarrios['NOMBRE'] == "U.P.B") | (dfBarrios['NOMBRE'] == "El Nogal-Los Almendros") | (dfBarrios['NOMBRE'] == "Cementerio Universal") | (dfBarrios['NOMBRE'] == "Centro Administrativo") | (dfBarrios['NOMBRE'] == "Facultad de Minas U. Nacional") | (dfBarrios['NOMBRE'] == "Las Acacias") | (dfBarrios['NOMBRE'] == "Plaza de Ferias") | (dfBarrios['NOMBRE'] == "Terminal de Transporte") | (dfBarrios['NOMBRE'] == "Oleoducto") | (dfBarrios['NOMBRE'] == "San Isidro") | (dfBarrios['NOMBRE'] == "Naranjal") | (dfBarrios['NOMBRE'] == "La Palma") | (dfBarrios['NOMBRE'] == "Las Palmas") | (dfBarrios['NOMBRE'] == "El Salado") | (dfBarrios['NOMBRE'] == "Altavista") | (dfBarrios['NOMBRE'] == "Sin Nombre") ].index  
dfBarrios.drop(indexNames , inplace=True)  
dfBarrios.head(5)

Out[4]:

	NOMBRE	SUBTIPO_BARRIOVEREDA	NOMBRE_COMUNA_CORREGIMIENTO
0	Tricentenario	1	Castilla
1	Villa Niza	1	Santa Cruz
2	Laureles	1	Laureles Estadio
3	Santa Rosa de Lima	1	San Javier
4	Santa Lucía	1	La América

In [5]: # Ordenamos los datos por nombre del barrio, renombramos algunas columnas y verificamos  
dfBarrios=dfBarrios[['NOMBRE','SUBTIPO\_BARRIOVEREDA','NOMBRE\_COMUNA\_CORREGIMIENTO']]  
dfBarrios.columns=['barrio','BarrioOVereda','Comuna']  
dfBarrios.sort\_values(by=['barrio'], ascending=True,inplace=True)  
dfBarrios.reset\_index(drop=True, inplace=True)  
dfBarrios.head()

Out[5]:

	barrio	BarrioOVereda	Comuna
0	Aldea Pablo VI	1	Popular
1	Alejandro Echavarría	1	Buenos Aires
2	Alejandría	1	El Poblado
3	Alfonso López	1	Castilla
4	Altamira	1	Robledo

Verificamos el numero de registros resultantes.

In [6]: dfBarrios.shape

Out[6]: (251, 3)

**Importamos libreria GePy, para obtener los datos geoespaciales de los barrios de la ciudad**

In [7]: from geopy.geocoders import Nominatim

In [8]: address = 'Medellin, CO'

```
geolocator = Nominatim(user_agent="mde_explorer")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('The geographical coordinate of Medellin City are {}, {}'.format(latitude, lon
```

The geographical coordinate of Medellin City are 6.2443382, -75.573553.

**Insertamos 2 columnas nuevas para la latitud y longitud**

In [9]: dfBarrios.insert(3, "lat", "")
dfBarrios.insert(4, "lng", "")
dfBarrios.head(5)

	barrio	BarrioOVereda	Comuna	lat	lng
0	Aldea Pablo VI		1	Popular	
1	Alejandro Echavarría		1	Buenos Aires	
2	Alejandría		1	El Poblado	
3	Alfonso López		1	Castilla	
4	Altamira		1	Robledo	

**Construimos un ciclo para asignar a cada fila, de nuestro DataFrame, los datos de latitud y longitud, resultantes de la libreria GePy**

```
In [10]: address = 'Medellin,CO'

for i in dfBarrios.index:
    nomBarrio = dfBarrios.loc[i, 'barrio']
    addressFull = nomBarrio + "," + address
    geolocator = Nominatim(user_agent="mde_explorer")
    location = geolocator.geocode(addressFull)
    #print(str(i) + dfBarrios.loc[i, 'NOMBRE'])
    if(location.latitude is not None and location.longitude is not None):
        latitude = location.latitude
        longitude = location.longitude
    else:
        print(dfBarrios.loc[i, 'barrio'] + "Tiene datos geoespaciales nulos")
        latitude = "NoData"
        longitude = "NoData"

    dfBarrios.loc[i, 'lat']= latitude
    dfBarrios.loc[i, 'lng']= longitude
```

**verificamos el numero de filas y columnas, que concuerden con los que teniamos anteriormente y si hay valores nulos**

```
In [11]: dfBarrios.shape
dfBarrios.isnull().any()
```

```
Out[11]: barrio      False
BarrioOvereda  False
Comuna        False
lat           False
lng            False
dtype: bool
```

## 5. Analisis

inicializamos los parametros para generar el mapa de la ciudad

```
In [12]: address = 'Medellin, CO'

geolocator = Nominatim(user_agent="mde_explorer")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('The geographical coordinate of Medellin City are {}, {}'.format(latitude, lon
```

The geographical coordinate of Medellin City are 6.2443382, -75.573553.

Generemos el mapa con sus marcadores

```
In [13]: # crear un mapa de Medellin utilizando los valores de Latitud y Longitud
map_mediellin = folium.Map(location=[latitude, longitude], zoom_start=12)

# añadir marcadores al mapa
for lat, lng, comuna, barrio in zip(dfBarrios['lat'], dfBarrios['lng'], dfBarrios['B
    label = '{}, {}'.format(barrio, comuna)
    label = folium.Popup(label, parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='blue',
        fill=True,
        fill_color='#3186cc',
        fill_opacity=0.7,
        parse_html=False).add_to(map_mediellin)

map_mediellin
```

Out[13]: Make this Notebook Trusted to load map: File -> Trust Notebook

## inicializamos los argumentos que utilizaremos para la Api Foursquare

```
In [14]: CLIENT_ID = '3KQ23TNDRE4U545FXH421FR50EUAJ0UU4PKVNC4XNHRE3LKM' # su ID de Foursquare
CLIENT_SECRET = 'L1MSXE30SXDOQ4CNBTSMIRK2ZAXX5NZ1S3S2IRU10TMMEBEA' # Secreto de Four
VERSION = '20180605' # versión de la API de Foursquare
LIMIT = 50 # Un valor límite para la API de Foursquare

print('Your credentials:')
print('CLIENT_ID: ' + CLIENT_ID)
print('CLIENT_SECRET: ' + CLIENT_SECRET)
```

Your credentials:  
 CLIENT\_ID: 3KQ23TNDRE4U545FXH421FR50EUAJ0UU4PKVNC4XNHRE3LKM  
 CLIENT\_SECRET:L1MSXE30SXDOQ4CNBTSMIRK2ZAXX5NZ1S3S2IRU10TMMEBEA

## Construimos una función para obtener los sitios cercanos de cada uno de los barrios de la ciudad. en un radio de 800 Mts y un límite de 50 sitios

```
In [15]: def getNearbyVenues(names, latitudes, longitudes, radius=800):

    venues_list=[]
    for name, lat, lng in zip(names, latitudes, longitudes):
        print(name)

        # crear la URL de solicitud de API
        url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_sec
              CLIENT_ID,
              CLIENT_SECRET,
              VERSION,
              lat,
              lng,
              radius,
              LIMIT)

        # solicitud GET
        results = requests.get(url).json()["response"]["groups"][0]["items"]

        # regresa solo información relevante de cada sitio cercano
        venues_list.append([
            name,
            lat,
            lng,
            v['venue']['name'],
            v['venue']['location']['lat'],
            v['venue']['location']['lng'],
            v['venue']['categories'][0]['name']) for v in results])

    nearby_venues = pd.DataFrame([item for venue_list in venues_list for item in venue_list])
    nearby_venues.columns = ['BARRIO',
                            'BARRIO Latitude',
                            'BARRIO Longitude',
                            'SITIO',
                            'SITIO Latitude',
                            'SITIO Longitude',
                            'SITIO Category']

    return(nearby_venues)
```

## Llamamos la función que construimos

```
In [17]: Medellin_venues = getNearbyVenues(names=dfBarrios['barrio'],
                                         latitudes=dfBarrios['lat'],
```

```
longitudes=dfBarrios['lng']
)
```

Aldea Pablo VI  
Alejandro Echavarría  
Alejandría  
Alfonso López  
Altamira  
Altos del Poblado  
Andalucía  
Antonio Nariño  
Aranjuez  
Asomadera No.1  
Asomadera No.2  
Asomadera No.3  
Astorga  
Aures No.1  
Aures No.2  
B. Cerro El Volador  
Barrio Caicedo  
Barrio Colombia  
Barrio Colón  
Barrio Cristóbal  
Barrios de Jesús  
Batallón Cuarta Brigada  
Batallón Girardot  
Belalcázar  
Belencito  
Bello Horizonte  
Belén  
Berlín  
Bermejal-Los Álamos  
Betania  
Blanquizal  
Bolivariana  
Bomboná No.1  
Bomboná No.2  
Bosques de San Pablo  
Boston  
Boyacá  
Brasilia  
Buenos Aires  
Calasanz  
Calasanz Parte Alta  
Calle Nueva  
Campo Alegre  
Campo Amor  
Campo Valdés No.1  
Campo Valdés No.2  
Caribe  
Carlos E. Restrepo  
Carpinelo  
Castilla  
Castropol  
Cataluña  
Cerro Nutibara  
Cerro Nutibara  
Corazón de Jesús  
Cristo Rey  
Cuarta Brigada  
Cucaracho  
Córdoba  
Diego Echavarría  
Doce de Octubre No.1  
Doce de Octubre No.2  
Ecoparque Cerro El Volador  
Eduardo Santos  
El Castillo  
El Chagualo

El Compromiso  
El Corazón  
El Danubio  
El Diamante  
El Diamante No.2  
El Pesebre  
El Pinal  
El Poblado  
El Pomar  
El Progreso  
El Raizal  
El Rincón  
El Rodeo  
El Salvador  
El Socorro  
El Tesoro  
El Triunfo  
El Velódromo  
Enciso  
Estación Villa  
Estadio  
Ferrini  
Florencia  
Florida Nueva  
Francisco Antonio Zea  
Fuente Clara  
Fátima  
Gerona  
Girardot  
Granada  
Granizal  
Guayabal  
Guayaquil  
Héctor Abad Gómez  
Jardín Botánico  
Jesús Nazareno  
Juan Pablo II  
Juan XXIII La Quiebra  
Kennedy  
La Aguacatala  
La Alpujarra  
La América  
La Avanzada  
La Candelaria  
La Castellana  
La Colina  
La Cruz  
La Esperanza  
La Esperanza No.2  
La Floresta  
La Florida  
La Francia  
La Frontera  
La Gloria  
La Hondonada  
La Isla  
La Ladera  
La Libertad  
La Loma de Los Bernal  
La Mansión  
La Milagrosa  
La Mota  
La Pilarica  
La Piñuela  
La Pradera  
La Rosa  
La Salle  
La Sierra  
Lalinde

Las Brisas  
Las Esmeraldas  
Las Estancias  
Las Granjas  
Las Independencias  
Las Lomas No.1  
Las Lomas No.2  
Las Mercedes  
Las Playas  
Las Violetas  
Laureles  
Llanaditas  
Lorena  
Loreto  
Los Alcázares  
Los Alpes  
Los Balsos No.1  
Los Balsos No.2  
Los Cerros El Vergel  
Los Colores  
Los Conquistadores  
Los Mangos  
Los Naranjos  
Los Pinos  
Los Ángeles  
López de Mesa  
Manila  
Manrique Central No.1  
Manrique Central No.2  
Manrique Oriental  
María Cano-Carambolas  
Metropolitano  
Mirador del Doce  
Miraflores  
Miranda  
Miravalle  
Monteclaro  
Moravia  
Moscú No.1  
Moscú No.2  
Nueva Villa de La Iguaná  
Nueva Villa del Aburrá  
Nuevos Conquistadores  
Ocho de Marzo  
Olaya Herrera  
Oriente  
Pablo VI  
Pajarito  
Palenque  
Palermo  
Parque Juan Pablo II  
Parque Norte  
Patio Bonito  
Pedregal  
Perpetuo Socorro  
Picachito  
Picacho  
Playón de Los Comuneros  
Popular  
Prado  
Progreso No.2  
Robledo  
Rosales  
San Antonio  
San Benito  
San Bernardo  
San Diego  
San Germán  
San Javier No.1

San Javier No.2  
 San Joaquín  
 San José La Cima No.1  
 San José La Cima No.2  
 San Lucas  
 San Martín de Porres  
 San Miguel  
 San Pablo  
 San Pedro  
 Santa Cruz  
 Santa Fé  
 Santa Inés  
 Santa Lucía  
 Santa Margarita  
 Santa María de Los Ángeles  
 Santa Mónica  
 Santa Rosa de Lima  
 Santa Teresita  
 Santander  
 Santo Domingo Savio No.1  
 Santo Domingo Savio No.2  
 Sevilla  
 Simón Bolívar  
 Sucre  
 Suramericana  
 Tejelo  
 Tenche  
 Toscana  
 Trece de Noviembre  
 Tricentenario  
 Trinidad  
 U.D. Atanasio Girardot  
 Universidad Nacional  
 Universidad de Antioquia  
 Veinte de Julio  
 Versalles No.1  
 Versalles No.2  
 Villa Carlota  
 Villa Flora  
 Villa Guadalupe  
 Villa Hermosa  
 Villa Lilliam  
 Villa Niza  
 Villa Nueva  
 Villa Turbay  
 Villa del Socorro  
 Villatina

**Revisemos el tamaño del nuevo DataFrame y las primeras filas**

```
In [18]: print(Medellin_venues.shape)
Medellin_venues.head()
```

(4471, 7)

	BARRIO	BARRIO Latitude	BARRIO Longitude	SITIO	SITIO Latitude	SITIO Longitude	SITIO Category
0	Aldea Pablo VI	6.288287	-75.542067	Parque Santo Domingo	6.293031	-75.541819	Plaza
1	Aldea Pablo VI	6.288287	-75.542067	Metrocable Linea L - Estación Santo Domingo	6.292908	-75.541689	Cable Car
2	Aldea Pablo VI	6.288287	-75.542067	La Mesa del Barrio	6.294749	-75.544043	South American Restaurant

	<b>BARRIO</b>	<b>BARRIO</b> Latitude	<b>BARRIO</b> Longitude		<b>SITIO</b>	<b>SITIO</b> Latitude	<b>SITIO</b> Longitude	<b>SITIO</b> Category
3	Aldea Pablo VI	6.288287	-75.542067	San José La Cima # 1	6.281684	-75.543637		Park
4	Aldea Pablo VI	6.288287	-75.542067	Alquiler T & M Equipos	6.281701	-75.544761		Rental Service

Revisemos cuantos retornaron para cada barrio

In [19]: `Medellin_venues.groupby('BARRIO').count()`

	<b>BARRIO</b>	<b>BARRIO</b> Latitude	<b>BARRIO</b> Longitude	<b>SITIO</b>	<b>SITIO</b> Latitude	<b>SITIO</b> Longitude	<b>SITIO</b> Category
	<b>BARRIO</b>						
	<b>Aldea Pablo VI</b>	5	5	5	5	5	5
	<b>Alejandro Echavarría</b>	8	8	8	8	8	8
	<b>Alejandría</b>	50	50	50	50	50	50
	<b>Alfonso López</b>	6	6	6	6	6	6
	<b>Altamira</b>	3	3	3	3	3	3
	<b>Altos del Poblado</b>	5	5	5	5	5	5
	<b>Andalucía</b>	4	4	4	4	4	4
	<b>Antonio Nariño</b>	4	4	4	4	4	4
	<b>Aranjuez</b>	7	7	7	7	7	7
	<b>Asomadera No.1</b>	35	35	35	35	35	35
	<b>Asomadera No.2</b>	37	37	37	37	37	37
	<b>Asomadera No.3</b>	41	41	41	41	41	41
	<b>Astorga</b>	50	50	50	50	50	50
	<b>Aures No.1</b>	3	3	3	3	3	3
	<b>Aures No.2</b>	2	2	2	2	2	2
	<b>B. Cerro El Volador</b>	15	15	15	15	15	15
	<b>Barrio Caicedo</b>	19	19	19	19	19	19
	<b>Barrio Colombia</b>	50	50	50	50	50	50
	<b>Barrio Colón</b>	50	50	50	50	50	50
	<b>Barrio Cristóbal</b>	16	16	16	16	16	16
	<b>Barrios de Jesús</b>	6	6	6	6	6	6
	<b>Batallón Cuarta Brigada</b>	44	44	44	44	44	44
	<b>Batallón Girardot</b>	4	4	4	4	4	4
	<b>Belalcázar</b>	6	6	6	6	6	6
	<b>Belencito</b>	10	10	10	10	10	10
	<b>Bello Horizonte</b>	3	3	3	3	3	3

BARRIO	BARrio Latitude	BARrio Longitude	SITIO	SITIO Latitude	SITIO Longitude	SITIO Category
<b>BARRIO</b>						
<b>Belén</b>	6	6	6	6	6	6
<b>Berlín</b>	7	7	7	7	7	7
<b>Bermejal-Los Álamos</b>	12	12	12	12	12	12
<b>Betania</b>	7	7	7	7	7	7
<b>Blanquizal</b>	2	2	2	2	2	2
<b>Bolivariana</b>	50	50	50	50	50	50
<b>Bomboná No.1</b>	50	50	50	50	50	50
<b>Bomboná No.2</b>	4	4	4	4	4	4
<b>Bosques de San Pablo</b>	4	4	4	4	4	4
<b>Boston</b>	44	44	44	44	44	44
<b>Boyacá</b>	4	4	4	4	4	4
<b>Brasilia</b>	14	14	14	14	14	14
<b>Buenos Aires</b>	15	15	15	15	15	15
<b>Calasanz</b>	34	34	34	34	34	34
<b>Calasanz Parte Alta</b>	18	18	18	18	18	18
<b>Calle Nueva</b>	50	50	50	50	50	50
<b>Campo Alegre</b>	8	8	8	8	8	8
<b>Campo Amor</b>	27	27	27	27	27	27
<b>Campo Valdés No.1</b>	10	10	10	10	10	10
<b>Campo Valdés No.2</b>	9	9	9	9	9	9
<b>Caribe</b>	17	17	17	17	17	17
<b>Carlos E. Restrepo</b>	30	30	30	30	30	30
<b>Carpinelo</b>	7	7	7	7	7	7
<b>Castilla</b>	50	50	50	50	50	50
<b>Castropol</b>	44	44	44	44	44	44
<b>Cataluña</b>	6	6	6	6	6	6
<b>Cerro Nutibara</b>	44	44	44	44	44	44
<b>Corazón de Jesús</b>	39	39	39	39	39	39
<b>Cristo Rey</b>	15	15	15	15	15	15
<b>Cuarta Brigada</b>	40	40	40	40	40	40
<b>Cucaracho</b>	2	2	2	2	2	2
<b>Córdoba</b>	6	6	6	6	6	6
<b>Diego Echavarría</b>	33	33	33	33	33	33
<b>Doce de Octubre No.1</b>	6	6	6	6	6	6

BARRIO	BARRIO Latitude	BARRIO Longitude	SITIO	SITIO Latitude	SITIO Longitude	SITIO Category
<b>Doce de Octubre No.2</b>	4	4	4	4	4	4
<b>Ecoparque Cerro El Volador</b>	19	19	19	19	19	19
<b>Eduardo Santos</b>	2	2	2	2	2	2
<b>El Castillo</b>	11	11	11	11	11	11
<b>El Chagualo</b>	18	18	18	18	18	18
<b>El Compromiso</b>	5	5	5	5	5	5
<b>El Corazón</b>	6	6	6	6	6	6
<b>El Danubio</b>	12	12	12	12	12	12
<b>El Diamante</b>	1	1	1	1	1	1
<b>El Diamante No.2</b>	44	44	44	44	44	44
<b>El Pesebre</b>	9	9	9	9	9	9
<b>El Pinal</b>	4	4	4	4	4	4
<b>El Poblado</b>	50	50	50	50	50	50
<b>El Pomar</b>	7	7	7	7	7	7
<b>El Progreso</b>	23	23	23	23	23	23
<b>El Raizal</b>	4	4	4	4	4	4
<b>El Rincón</b>	6	6	6	6	6	6
<b>El Rodeo</b>	6	6	6	6	6	6
<b>El Salvador</b>	12	12	12	12	12	12
<b>El Socorro</b>	5	5	5	5	5	5
<b>El Tesoro</b>	50	50	50	50	50	50
<b>El Triunfo</b>	2	2	2	2	2	2
<b>El Velódromo</b>	46	46	46	46	46	46
<b>Enciso</b>	10	10	10	10	10	10
<b>Estación Villa</b>	32	32	32	32	32	32
<b>Estadio</b>	44	44	44	44	44	44
<b>Ferrini</b>	21	21	21	21	21	21
<b>Florencia</b>	6	6	6	6	6	6
<b>Florida Nueva</b>	50	50	50	50	50	50
<b>Francisco Antonio Zea</b>	6	6	6	6	6	6
<b>Fuente Clara</b>	2	2	2	2	2	2
<b>Fátima</b>	50	50	50	50	50	50
<b>Gerona</b>	14	14	14	14	14	14

BARRIO	BARRIO Latitude	BARRIO Longitude	SITIO	SITIO Latitude	SITIO Longitude	SITIO Category
<b>BARRIO</b>						
<b>Girardot</b>	6	6	6	6	6	6
<b>Granada</b>	14	14	14	14	14	14
<b>Granizal</b>	5	5	5	5	5	5
<b>Guayabal</b>	16	16	16	16	16	16
<b>Guayaquil</b>	50	50	50	50	50	50
<b>Héctor Abad Gómez</b>	4	4	4	4	4	4
<b>Jardín Botánico</b>	24	24	24	24	24	24
<b>Jesús Nazareno</b>	21	21	21	21	21	21
<b>Juan Pablo II</b>	2	2	2	2	2	2
<b>Juan XXIII La Quiebra</b>	3	3	3	3	3	3
<b>Kennedy</b>	2	2	2	2	2	2
<b>La Aguacatala</b>	50	50	50	50	50	50
<b>La Alpujarra</b>	50	50	50	50	50	50
<b>La América</b>	32	32	32	32	32	32
<b>La Avanzada</b>	4	4	4	4	4	4
<b>La Candelaria</b>	50	50	50	50	50	50
<b>La Castellana</b>	50	50	50	50	50	50
<b>La Colina</b>	7	7	7	7	7	7
<b>La Cruz</b>	3	3	3	3	3	3
<b>La Esperanza</b>	4	4	4	4	4	4
<b>La Esperanza No.2</b>	4	4	4	4	4	4
<b>La Floresta</b>	24	24	24	24	24	24
<b>La Florida</b>	50	50	50	50	50	50
<b>La Francia</b>	4	4	4	4	4	4
<b>La Frontera</b>	4	4	4	4	4	4
<b>La Gloria</b>	8	8	8	8	8	8
<b>La Hondonada</b>	3	3	3	3	3	3
<b>La Isla</b>	4	4	4	4	4	4
<b>La Ladera</b>	4	4	4	4	4	4
<b>La Libertad</b>	5	5	5	5	5	5
<b>La Loma de Los Bernal</b>	17	17	17	17	17	17
<b>La Mansión</b>	4	4	4	4	4	4
<b>La Milagrosa</b>	11	11	11	11	11	11
<b>La Mota</b>	32	32	32	32	32	32

BARRIO	BARrio Latitude	BARrio Longitude	SITIO	SITIO Latitude	SITIO Longitude	SITIO Category
BARRIO						
<b>La Pilarica</b>	2	2	2	2	2	2
<b>La Piñuela</b>	7	7	7	7	7	7
<b>La Pradera</b>	4	4	4	4	4	4
<b>La Rosa</b>	4	4	4	4	4	4
<b>La Salle</b>	5	5	5	5	5	5
<b>La Sierra</b>	3	3	3	3	3	3
<b>Lalinde</b>	50	50	50	50	50	50
<b>Las Brisas</b>	6	6	6	6	6	6
<b>Las Esmeraldas</b>	5	5	5	5	5	5
<b>Las Estancias</b>	4	4	4	4	4	4
<b>Las Granjas</b>	4	4	4	4	4	4
<b>Las Independencias</b>	6	6	6	6	6	6
<b>Las Lomas No.1</b>	50	50	50	50	50	50
<b>Las Lomas No.2</b>	36	36	36	36	36	36
<b>Las Mercedes</b>	32	32	32	32	32	32
<b>Las Playas</b>	31	31	31	31	31	31
<b>Las Violetas</b>	5	5	5	5	5	5
<b>Laureles</b>	50	50	50	50	50	50
<b>Llanaditas</b>	4	4	4	4	4	4
<b>Lorena</b>	50	50	50	50	50	50
<b>Loreto</b>	4	4	4	4	4	4
<b>Los Alcázares</b>	19	19	19	19	19	19
<b>Los Alpes</b>	36	36	36	36	36	36
<b>Los Balsos No.1</b>	23	23	23	23	23	23
<b>Los Balsos No.2</b>	50	50	50	50	50	50
<b>Los Cerros El Vergel</b>	8	8	8	8	8	8
<b>Los Colores</b>	35	35	35	35	35	35
<b>Los Conquistadores</b>	50	50	50	50	50	50
<b>Los Mangos</b>	4	4	4	4	4	4
<b>Los Naranjos</b>	50	50	50	50	50	50
<b>Los Pinos</b>	50	50	50	50	50	50
<b>Los Ángeles</b>	49	49	49	49	49	49
<b>López de Mesa</b>	3	3	3	3	3	3
<b>Manila</b>	50	50	50	50	50	50

BARRIO	BARRIO Latitude	BARRIO Longitude	SITIO	SITIO Latitude	SITIO Longitude	SITIO Category
<b>BARRIO</b>						
<b>Manrique Central No.1</b>	7	7	7	7	7	7
<b>Manrique Central No.2</b>	9	9	9	9	9	9
<b>Manrique Oriental</b>	6	6	6	6	6	6
<b>María Cano-Carambolas</b>	5	5	5	5	5	5
<b>Metropolitano</b>	4	4	4	4	4	4
<b>Mirador del Doce</b>	5	5	5	5	5	5
<b>Miraflores</b>	12	12	12	12	12	12
<b>Miranda</b>	15	15	15	15	15	15
<b>Miravalle</b>	50	50	50	50	50	50
<b>Moravia</b>	8	8	8	8	8	8
<b>Moscú No.1</b>	4	4	4	4	4	4
<b>Moscú No.2</b>	6	6	6	6	6	6
<b>Nueva Villa de La Iguaná</b>	33	33	33	33	33	33
<b>Nueva Villa del Aburrá</b>	50	50	50	50	50	50
<b>Nuevos Conquistadores</b>	6	6	6	6	6	6
<b>Ocho de Marzo</b>	2	2	2	2	2	2
<b>Olaya Herrera</b>	3	3	3	3	3	3
<b>Oriente</b>	3	3	3	3	3	3
<b>Pablo VI</b>	4	4	4	4	4	4
<b>Palenque</b>	6	6	6	6	6	6
<b>Palermo</b>	7	7	7	7	7	7
<b>Parque Juan Pablo II</b>	16	16	16	16	16	16
<b>Parque Norte</b>	20	20	20	20	20	20
<b>Patio Bonito</b>	50	50	50	50	50	50
<b>Pedregal</b>	4	4	4	4	4	4
<b>Perpetuo Socorro</b>	50	50	50	50	50	50
<b>Picachito</b>	3	3	3	3	3	3
<b>Playón de Los Comuneros</b>	3	3	3	3	3	3
<b>Popular</b>	4	4	4	4	4	4
<b>Prado</b>	23	23	23	23	23	23

BARRIO	BARRIO Latitude	BARRIO Longitude	SITIO	SITIO Latitude	SITIO Longitude	SITIO Category
<b>BARRIO</b>						
<b>Progreso No.2</b>	4	4	4	4	4	4
<b>Robledo</b>	6	6	6	6	6	6
<b>Rosales</b>	50	50	50	50	50	50
<b>San Antonio</b>	4	4	4	4	4	4
<b>San Benito</b>	29	29	29	29	29	29
<b>San Bernardo</b>	17	17	17	17	17	17
<b>San Diego</b>	33	33	33	33	33	33
<b>San Germán</b>	13	13	13	13	13	13
<b>San Javier No.1</b>	5	5	5	5	5	5
<b>San Javier No.2</b>	4	4	4	4	4	4
<b>San Joaquín</b>	50	50	50	50	50	50
<b>San José La Cima No.1</b>	5	5	5	5	5	5
<b>San José La Cima No.2</b>	5	5	5	5	5	5
<b>San Lucas</b>	29	29	29	29	29	29
<b>San Martín de Porres</b>	2	2	2	2	2	2
<b>San Miguel</b>	16	16	16	16	16	16
<b>San Pablo</b>	4	4	4	4	4	4
<b>San Pedro</b>	30	30	30	30	30	30
<b>Santa Cruz</b>	6	6	6	6	6	6
<b>Santa Fé</b>	27	27	27	27	27	27
<b>Santa Inés</b>	5	5	5	5	5	5
<b>Santa Lucía</b>	8	8	8	8	8	8
<b>Santa Margarita</b>	3	3	3	3	3	3
<b>Santa María de Los Ángeles</b>	45	45	45	45	45	45
<b>Santa Mónica</b>	7	7	7	7	7	7
<b>Santa Rosa de Lima</b>	3	3	3	3	3	3
<b>Santa Teresita</b>	8	8	8	8	8	8
<b>Santander</b>	2	2	2	2	2	2
<b>Santo Domingo Savio No.1</b>	4	4	4	4	4	4
<b>Santo Domingo Savio No.2</b>	6	6	6	6	6	6
<b>Sevilla</b>	31	31	31	31	31	31

BARRIO	BARrio Latitude	BARrio Longitude	SITIO	SITIO Latitude	SITIO Longitude	SITIO Category
<b>Simón Bolívar</b>	48	48	48	48	48	48
<b>Sucre</b>	14	14	14	14	14	14
<b>Suramericana</b>	50	50	50	50	50	50
<b>Tejelo</b>	4	4	4	4	4	4
<b>Tenche</b>	19	19	19	19	19	19
<b>Toscana</b>	7	7	7	7	7	7
<b>Trece de Noviembre</b>	3	3	3	3	3	3
<b>Tricentenario</b>	5	5	5	5	5	5
<b>Trinidad</b>	12	12	12	12	12	12
<b>U.D. Atanasio Girardot</b>	50	50	50	50	50	50
<b>Universidad Nacional</b>	21	21	21	21	21	21
<b>Universidad de Antioquia</b>	24	24	24	24	24	24
<b>Veinte de Julio</b>	10	10	10	10	10	10
<b>Versalles No.1</b>	50	50	50	50	50	50
<b>Versalles No.2</b>	3	3	3	3	3	3
<b>Villa Carlota</b>	50	50	50	50	50	50
<b>Villa Flora</b>	5	5	5	5	5	5
<b>Villa Guadalupe</b>	4	4	4	4	4	4
<b>Villa Hermosa</b>	4	4	4	4	4	4
<b>Villa Lilliam</b>	5	5	5	5	5	5
<b>Villa Niza</b>	7	7	7	7	7	7
<b>Villa Nueva</b>	50	50	50	50	50	50
<b>Villa Turbay</b>	1	1	1	1	1	1
<b>Villa del Socorro</b>	4	4	4	4	4	4
<b>Villatina</b>	4	4	4	4	4	4

Encontremos cuantas categorías únicas se pueden conservar de todos los sitios regresados

```
In [20]: print('Hay {} categorias unicas.'.format(len(Medellin_venues['SITIO Category']).unique))
Hay 228 categorias unicas.
```

## Analicemos cada barrio

```
In [21]: # codificación
Medellin_onehot = pd.get_dummies(Medellin_venues[['SITIO Category']], prefix="", pre
# añadir La columna de barrio de regreso al dataframe
```

```
Medellin_onehot['BARRIO'] = Medellin_venues['BARRIO']

# mover la columna de barrio a la primera columna
fixed_columns = [Medellin_onehot.columns[-1]] + list(Medellin_onehot.columns[:-1])
Medellin_onehot = Medellin_onehot[fixed_columns]

Medellin_onehot.head()
```

Out[21]:

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop	Aquarium
0	Aldea Pablo VI	0	0	0	0	0	0	0	0
1	Aldea Pablo VI	0	0	0	0	0	0	0	0
2	Aldea Pablo VI	0	0	0	0	0	0	0	0
3	Aldea Pablo VI	0	0	0	0	0	0	0	0
4	Aldea Pablo VI	0	0	0	0	0	0	0	0



Verifiquemos el nuevo tamaño del DataFrame

In [22]: Medellin\_onehot.shape

Out[22]: (4471, 229)

**Agrupemos las filas por barrios tomando la media de la frecuencia de la ocurrencia de cada categoría**

```
Medellin_grouped = Medellin_onehot.groupby('BARRIO').mean().reset_index()
Medellin_grouped
```

Out[23]:

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop
0	Aldea Pablo VI	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
1	Alejandro Echavarría	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
2	Alejandría	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
3	Alfonso López	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
4	Altamira	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
5	Altos del Poblado	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
6	Andalucía	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
7	Antonio Nariño	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
8	Aranjuez	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop
9	Asomadera No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
10	Asomadera No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
11	Asomadera No.3	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
12	Astorga	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
13	Aures No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
14	Aures No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
15	B. Cerro El Volador	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
16	Barrio Caicedo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
17	Barrio Colombia	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
18	Barrio Colón	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
19	Barrio Cristóbal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
20	Barrios de Jesús	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
21	Batallón Cuarta Brigada	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
22	Batallón Girardot	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
23	Belalcázar	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
24	Belencito	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
25	Bello Horizonte	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
26	Belén	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
27	Berlín	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
28	Bermejal-Los Álamos	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
29	Betania	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
30	Blanquiza	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
31	Bolivariana	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
32	Bomboná No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
33	Bomboná No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
34	Bosques de San Pablo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
35	Boston	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
36	Boyacá	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
37	Brasilia	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop
38	Buenos Aires	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
39	Calasanz	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
40	Calasanz Parte Alta	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
41	Calle Nueva	0.000000	0.000000	0.000000	0.000000	0.000000	0.020000	0.0
42	Campo Alegre	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
43	Campo Amor	0.000000	0.037037	0.037037	0.000000	0.000000	0.000000	0.0
44	Campo Valdés No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
45	Campo Valdés No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
46	Caribe	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
47	Carlos E. Restrepo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
48	Carpinelo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
49	Castilla	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
50	Castropol	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
51	Cataluña	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
52	Cerro Nutibara	0.000000	0.000000	0.000000	0.000000	0.000000	0.045455	0.0
53	Corazón de Jesús	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
54	Cristo Rey	0.000000	0.000000	0.000000	0.066667	0.000000	0.000000	0.0
55	Cuarta Brigada	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
56	Cucaracho	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
57	Córdoba	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
58	Diego Echavarría	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
59	Doce de Octubre No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
60	Doce de Octubre No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
61	Ecoparque Cerro El Volador	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
62	Eduardo Santos	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
63	El Castillo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
64	El Chagualo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
65	El Compromiso	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop
66	El Corazón	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
67	El Danubio	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
68	El Diamante	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
69	El Diamante No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
70	El Pesebre	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
71	El Pinal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
72	El Poblado	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
73	El Pomar	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
74	El Progreso	0.043478	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
75	El Raizal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
76	El Rincón	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
77	El Rodeo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
78	El Salvador	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
79	El Socorro	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
80	El Tesoro	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
81	El Triunfo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
82	El Velódromo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
83	Enciso	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
84	Estación Villa	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
85	Estadio	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
86	Ferrini	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
87	Florencia	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
88	Florida Nueva	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
89	Francisco Antonio Zea	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
90	Fuente Clara	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
91	Fátima	0.000000	0.000000	0.000000	0.000000	0.000000	0.020000	0.0
92	Gerona	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
93	Girardot	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
94	Granada	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
95	Granizal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
96	Guayabal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
97	Guayaquil	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop
98	Héctor Abad Gómez	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
99	Jardín Botánico	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
100	Jesús Nazareno	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
101	Juan Pablo II	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
102	Juan XXIII La Quiebra	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
103	Kennedy	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
104	La Aguacatala	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
105	La Alpujarra	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
106	La América	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
107	La Avanzada	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
108	La Candelaria	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
109	La Castellana	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
110	La Colina	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
111	La Cruz	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
112	La Esperanza	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
113	La Esperanza No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
114	La Floresta	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
115	La Florida	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
116	La Francia	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
117	La Frontera	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
118	La Gloria	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
119	La Hondonada	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
120	La Isla	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
121	La Ladera	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
122	La Libertad	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
123	La Loma de Los Bernal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
124	La Mansión	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
125	La Milagrosa	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
126	La Mota	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
127	La Pilarica	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
128	La Piñuela	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
129	La Pradera	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop
130	La Rosa	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
131	La Salle	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
132	La Sierra	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
133	Lalinde	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
134	Las Brisas	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
135	Las Esmeraldas	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
136	Las Estancias	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
137	Las Granjas	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
138	Las Independencias	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
139	Las Lomas No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
140	Las Lomas No.2	0.000000	0.000000	0.000000	0.000000	0.027778	0.000000	0.0
141	Las Mercedes	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
142	Las Playas	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
143	Las Violetas	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
144	Laureles	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
145	Llanaditas	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
146	Lorena	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
147	Loreto	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
148	Los Alcázares	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
149	Los Alpes	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
150	Los Balsos No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
151	Los Balsos No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
152	Los Cerros El Vergel	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
153	Los Colores	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
154	Los Conquistadores	0.000000	0.000000	0.000000	0.000000	0.000000	0.020000	0.0
155	Los Mangos	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
156	Los Naranjos	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
157	Los Pinos	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
158	Los Ángeles	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
159	López de Mesa	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
160	Manila	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
161	Manrique Central No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop
162	Manrique Central No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
163	Manrique Oriental	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
164	María Cano-Caramolas	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
165	Metropolitano	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
166	Mirador del Doce	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
167	Miraflores	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
168	Miranda	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
169	Miravalle	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
170	Moravia	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
171	Moscú No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
172	Moscú No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
173	Nueva Villa de La Iguaná	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
174	Nueva Villa del Aburrá	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
175	Nuevos Conquistadores	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
176	Ocho de Marzo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
177	Olaya Herrera	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
178	Oriente	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
179	Pablo VI	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
180	Palenque	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
181	Palermo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
182	Parque Juan Pablo II	0.000000	0.062500	0.062500	0.000000	0.000000	0.000000	0.0
183	Parque Norte	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
184	Patio Bonito	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
185	Pedregal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
186	Perpetuo Socorro	0.000000	0.000000	0.000000	0.000000	0.000000	0.020000	0.0
187	Picachito	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
188	Playón de Los Comuneros	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
189	Popular	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop
190	Prado	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
191	Progreso No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
192	Robledo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
193	Rosales	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
194	San Antonio	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
195	San Benito	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
196	San Bernardo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
197	San Diego	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
198	San Germán	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
199	San Javier No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
200	San Javier No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
201	San Joaquín	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
202	San José La Cima No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
203	San José La Cima No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.2
204	San Lucas	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
205	San Martín de Porres	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
206	San Miguel	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
207	San Pablo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
208	San Pedro	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
209	Santa Cruz	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
210	Santa Fé	0.000000	0.037037	0.037037	0.000000	0.000000	0.000000	0.0
211	Santa Inés	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.2
212	Santa Lucía	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
213	Santa Margarita	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
214	Santa María de Los Ángeles	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
215	Santa Mónica	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
216	Santa Rosa de Lima	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
217	Santa Teresita	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
218	Santander	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
219	Santo Domingo Savio No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

	BARRIO	Advertising Agency	Airport	Airport Lounge	Airport Terminal	American Restaurant	Amphitheater	Antique Shop
220	Santo Domingo Savio No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
221	Sevilla	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
222	Simón Bolívar	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
223	Sucre	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
224	Suramericana	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
225	Tejelo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
226	Tenche	0.000000	0.000000	0.000000	0.000000	0.000000	0.052632	0.0
227	Toscana	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
228	Trece de Noviembre	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
229	Tricentenario	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
230	Trinidad	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
231	U.D. Atanasio Girardot	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
232	Universidad Nacional	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
233	Universidad de Antioquia	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
234	Veinte de Julio	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
235	Versalles No.1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
236	Versalles No.2	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
237	Villa Carlota	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
238	Villa Flora	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
239	Villa Guadalupe	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
240	Villa Hermosa	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
241	Villa Lilliam	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
242	Villa Niza	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
243	Villa Nueva	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
244	Villa Turbay	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
245	Villa del Socorro	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
246	Villatina	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

◀ ▶

Confirmemos el tamaño del DataFrame

In [24]: Medellin\_grouped.shape

Out[24]: (247, 229)

## Imprimamos cada barrio junto con los 5 sitios mas comunes

In [25]: num\_top\_venues = 5

```
for hood in Medellin_grouped['BARRIO']:
    print("----"+hood+"----")
    temp = Medellin_grouped[Medellin_grouped['BARRIO'] == hood].T.reset_index()
    temp.columns = ['lugar','freq']
    temp = temp.iloc[1:]
    temp['freq'] = temp['freq'].astype(float)
    temp = temp.round({'freq': 2})
    print(temp.sort_values('freq', ascending=False).reset_index(drop=True).head(num_
    print('\n')
```

----Aldea Pablo VI----

	lugar	freq
0	Plaza	0.2
1	Rental Service	0.2
2	Cable Car	0.2
3	Park	0.2
4	South American Restaurant	0.2

----Alejandro Echavarría----

	lugar	freq
0	Pizza Place	0.12
1	Tram Station	0.12
2	Multiplex	0.12
3	Gym / Fitness Center	0.12
4	Shopping Mall	0.12

----Alejandria----

	lugar	freq
0	Hotel	0.12
1	Café	0.10
2	Shopping Mall	0.08
3	Pizza Place	0.06
4	Bakery	0.04

----Alfonso López----

	lugar	freq
0	Rest Area	0.17
1	Fried Chicken Joint	0.17
2	Public Art	0.17
3	BBQ Joint	0.17
4	Fast Food Restaurant	0.17

----Altamira----

	lugar	freq
0	Wings Joint	0.33
1	Food	0.33
2	BBQ Joint	0.33
3	Advertising Agency	0.00
4	Other Repair Shop	0.00

----Altos del Poblado----

	lugar	freq
0	Gym / Fitness Center	0.4
1	BBQ Joint	0.2
2	Hotel	0.2
3	Breakfast Spot	0.2
4	Advertising Agency	0.0

## ----Andalucía----

		lugar	freq
0	Metro Station	0.5	
1	Cable Car	0.5	
2	Advertising Agency	0.0	
3	Outdoor Event Space	0.0	
4	Music Store	0.0	

## ----Antonio Nariño----

		lugar	freq
0	Construction & Landscaping	0.25	
1	Fast Food Restaurant	0.25	
2	Juice Bar	0.25	
3	Seafood Restaurant	0.25	
4	Outlet Mall	0.00	

## ----Aranjuez----

		lugar	freq
0	Plaza	0.14	
1	Shopping Mall	0.14	
2	Convenience Store	0.14	
3	Donut Shop	0.14	
4	Recreation Center	0.14	

## ----Asomadera No.1----

		lugar	freq
0	Café	0.06	
1	Ice Cream Shop	0.06	
2	Sandwich Place	0.06	
3	Steakhouse	0.06	
4	Hotel	0.06	

## ----Asomadera No.2----

		lugar	freq
0	Hotel	0.11	
1	Italian Restaurant	0.08	
2	Supermarket	0.08	
3	Nightclub	0.05	
4	History Museum	0.05	

## ----Asomadera No.3----

		lugar	freq
0	Hotel	0.10	
1	Italian Restaurant	0.07	
2	Restaurant	0.07	
3	Supermarket	0.05	
4	Burger Joint	0.05	

## ----Astorga----

		lugar	freq
0	Café	0.12	
1	Restaurant	0.06	
2	Argentinian Restaurant	0.06	
3	Burger Joint	0.04	
4	Cocktail Bar	0.04	

## ----Aures No.1----

		lugar	freq
0	Cosmetics Shop	0.33	
1	Home Service	0.33	

2	Men's Store	0.33
3	Outlet Mall	0.00
4	Music Store	0.00

## ----Aures No.2----

	lugar	freq
0	Home Service	0.5
1	Athletics & Sports	0.5
2	Advertising Agency	0.0
3	Outlet Mall	0.0
4	Museum	0.0

## ----B. Cerro El Volador----

	lugar	freq
0	BBQ Joint	0.13
1	Food	0.07
2	Scenic Lookout	0.07
3	Fast Food Restaurant	0.07
4	Supermarket	0.07

## ----Barrio Caicedo----

	lugar	freq
0	Bar	0.16
1	Boutique	0.05
2	Park	0.05
3	Pizza Place	0.05
4	Café	0.05

## ----Barrio Colombia----

	lugar	freq
0	Italian Restaurant	0.06
1	Nightclub	0.06
2	Ice Cream Shop	0.04
3	Hotel	0.04
4	Café	0.04

## ----Barrio Colón----

	lugar	freq
0	Sandwich Place	0.08
1	Shopping Mall	0.06
2	Clothing Store	0.06
3	Plaza	0.06
4	Tram Station	0.04

## ----Barrio Cristóbal----

	lugar	freq
0	Gym	0.12
1	Ice Cream Shop	0.12
2	Pizza Place	0.12
3	Fast Food Restaurant	0.12
4	Café	0.06

## ----Barrios de Jesús----

	lugar	freq
0	Tram Station	0.33
1	Salon / Barbershop	0.17
2	Soccer Field	0.17
3	Shoe Store	0.17
4	Hardware Store	0.17

## ----Batallón Cuarta Brigada----

	lugar	freq
0	Shopping Mall	0.09
1	Sandwich Place	0.07
2	Gym	0.07
3	Ice Cream Shop	0.07
4	Hotel	0.07

-----Batallón Girardot-----

	lugar	freq
0	Park	0.50
1	Comfort Food Restaurant	0.25
2	Other Great Outdoors	0.25
3	Advertising Agency	0.00
4	Outlet Mall	0.00

-----Belalcázar-----

	lugar	freq
0	Grocery Store	0.17
1	Tennis Court	0.17
2	Recreation Center	0.17
3	Metro Station	0.17
4	Farm	0.17

-----Belencito-----

	lugar	freq
0	Ice Cream Shop	0.2
1	Fast Food Restaurant	0.1
2	Scenic Lookout	0.1
3	Café	0.1
4	General Entertainment	0.1

-----Bello Horizonte-----

	lugar	freq
0	Grocery Store	0.33
1	Hotel	0.33
2	Wings Joint	0.33
3	Advertising Agency	0.00
4	Museum	0.00

-----Belén-----

	lugar	freq
0	Gun Range	0.17
1	Club House	0.17
2	Market	0.17
3	Gym	0.17
4	Bakery	0.17

-----Berlín-----

	lugar	freq
0	Plaza	0.29
1	Fast Food Restaurant	0.29
2	Recreation Center	0.14
3	Park	0.14
4	Café	0.14

-----Bermejal-Los Álamos-----

	lugar	freq
0	Plaza	0.17
1	Art Museum	0.08
2	Recreation Center	0.08
3	Donut Shop	0.08
4	Sandwich Place	0.08

## ----Betania----

	lugar	freq
0	Ice Cream Shop	0.29
1	Scenic Lookout	0.14
2	Coffee Shop	0.14
3	Art Gallery	0.14
4	Café	0.14

## ----Balanquiza---

	lugar	freq
0	Coffee Shop	0.5
1	Shopping Mall	0.5
2	Advertising Agency	0.0
3	Outlet Mall	0.0
4	Music Store	0.0

## ----Bolivariana----

	lugar	freq
0	Italian Restaurant	0.10
1	Café	0.08
2	Peruvian Restaurant	0.06
3	Burger Joint	0.04
4	Mexican Restaurant	0.04

## ----Bomboná No.1----

	lugar	freq
0	Bar	0.10
1	Sandwich Place	0.06
2	Theater	0.06
3	Plaza	0.04
4	Pizza Place	0.04

## ----Bomboná No.2----

	lugar	freq
0	Tram Station	0.50
1	Pizza Place	0.25
2	Soccer Field	0.25
3	Advertising Agency	0.00
4	Other Repair Shop	0.00

## ----Bosques de San Pablo----

	lugar	freq
0	Grocery Store	0.25
1	Music Store	0.25
2	Food	0.25
3	BBQ Joint	0.25
4	Multiplex	0.00

## ----Boston----

	lugar	freq
0	Bar	0.11
1	Pizza Place	0.07
2	Plaza	0.07
3	Italian Restaurant	0.05
4	Gastropub	0.05

## ----Boyacá----

	lugar	freq
0	Ice Cream Shop	0.25
1	Burger Joint	0.25

2	Bar	0.25
3	Park	0.25
4	Advertising Agency	0.00

## ----Brasilia----

	lugar	freq
0	Botanical Garden	0.07
1	Art Museum	0.07
2	Plaza	0.07
3	Garden Center	0.07
4	Café	0.07

## ----Buenos Aires----

	lugar	freq
0	Bar	0.13
1	Food Court	0.07
2	Steakhouse	0.07
3	Farmers Market	0.07
4	Supermarket	0.07

## ----Calasanz----

	lugar	freq
0	Ice Cream Shop	0.09
1	Hotel	0.09
2	Grocery Store	0.09
3	Burger Joint	0.06
4	Juice Bar	0.06

## ----Calasanz Parte Alta----

	lugar	freq
0	Grocery Store	0.17
1	Ice Cream Shop	0.11
2	Juice Bar	0.11
3	Fast Food Restaurant	0.11
4	Gastropub	0.06

## ----Calle Nueva----

	lugar	freq
0	Café	0.08
1	Metro Station	0.06
2	Restaurant	0.06
3	Beer Garden	0.04
4	Clothing Store	0.04

## ----Campo Alegre----

	lugar	freq
0	Burger Joint	0.25
1	Convenience Store	0.12
2	BBQ Joint	0.12
3	General Entertainment	0.12
4	Park	0.12

## ----Campo Amor----

	lugar	freq
0	Sandwich Place	0.07
1	Plaza	0.07
2	Italian Restaurant	0.04
3	Burger Joint	0.04
4	Fried Chicken Joint	0.04

## ----Campo Valdés No.1----

	lugar	freq
0	Plaza	0.1
1	Bus Station	0.1
2	Bakery	0.1
3	Liquor Store	0.1
4	Gym / Fitness Center	0.1

----Campo Valdés No.2----

	lugar	freq
0	Plaza	0.11
1	Department Store	0.11
2	Shopping Mall	0.11
3	Bus Station	0.11
4	Gym / Fitness Center	0.11

----Caribe----

	lugar	freq
0	Theme Park	0.06
1	Shopping Mall	0.06
2	Salad Place	0.06
3	Supermarket	0.06
4	Fast Food Restaurant	0.06

----Carlos E. Restrepo----

	lugar	freq
0	Gym	0.10
1	Pizza Place	0.07
2	Hotel	0.07
3	Sandwich Place	0.07
4	Seafood Restaurant	0.07

----Carpinelo----

	lugar	freq
0	Liquor Store	0.29
1	Construction & Landscaping	0.14
2	Restaurant	0.14
3	Caribbean Restaurant	0.14
4	Cable Car	0.14

----Castilla----

	lugar	freq
0	Cocktail Bar	0.08
1	Café	0.08
2	Hotel	0.06
3	Restaurant	0.04
4	Asian Restaurant	0.04

----Castropol----

	lugar	freq
0	Hotel	0.11
1	Italian Restaurant	0.07
2	Restaurant	0.07
3	Supermarket	0.07
4	Café	0.05

----Cataluña----

	lugar	freq
0	Construction & Landscaping	0.17
1	Supermarket	0.17
2	Ice Cream Shop	0.17
3	Pizza Place	0.17
4	Department Store	0.17

## ----Cerro Nutibara----

	lugar	freq
0	Bar	0.14
1	Metro Station	0.09
2	Motorcycle Shop	0.05
3	Historic Site	0.05
4	Food & Drink Shop	0.05

## ----Corazón de Jesús----

	lugar	freq
0	Restaurant	0.13
1	Café	0.13
2	Sandwich Place	0.08
3	Clothing Store	0.05
4	Plaza	0.05

## ----Cristo Rey----

	lugar	freq
0	Supermarket	0.07
1	Fast Food Restaurant	0.07
2	Plaza	0.07
3	Airport Terminal	0.07
4	Women's Store	0.07

## ----Cuarta Brigada----

	lugar	freq
0	Gym	0.10
1	Shopping Mall	0.08
2	Soccer Stadium	0.08
3	Athletics & Sports	0.08
4	Stadium	0.05

## ----Cucaracho----

	lugar	freq
0	Farmers Market	0.5
1	Bar	0.5
2	Advertising Agency	0.0
3	Outdoor Event Space	0.0
4	Music Store	0.0

## ----Córdoba----

	lugar	freq
0	Convenience Store	0.17
1	Donut Shop	0.17
2	Fried Chicken Joint	0.17
3	Shopping Mall	0.17
4	Bus Station	0.17

## ----Diego Echavarría----

	lugar	freq
0	Shopping Mall	0.15
1	Supermarket	0.09
2	Gym / Fitness Center	0.06
3	Italian Restaurant	0.06
4	Pizza Place	0.06

## ----Doce de Octubre No.1----

	lugar	freq
0	Soccer Field	0.33
1	Playground	0.17

2	Mountain	0.17
3	Recreation Center	0.17
4	Scenic Lookout	0.17

## ----Doce de Octubre No.2----

	lugar	freq
0	Laundromat	0.25
1	Soccer Field	0.25
2	Recreation Center	0.25
3	Scenic Lookout	0.25
4	Outdoor Event Space	0.00

## ----Ecoparque Cerro El Volador----

	lugar	freq
0	BBQ Joint	0.11
1	Italian Restaurant	0.05
2	Playground	0.05
3	Plaza	0.05
4	Restaurant	0.05

## ----Eduardo Santos----

	lugar	freq
0	Pier	0.5
1	BBQ Joint	0.5
2	Advertising Agency	0.0
3	Outdoor Event Space	0.0
4	Museum	0.0

## ----El Castillo----

	lugar	freq
0	Supermarket	0.18
1	BBQ Joint	0.09
2	Gym / Fitness Center	0.09
3	Museum	0.09
4	Garden	0.09

## ----El Chagualo----

	lugar	freq
0	Café	0.11
1	Shopping Mall	0.06
2	Farmers Market	0.06
3	Bar	0.06
4	Sandwich Place	0.06

## ----El Compromiso----

	lugar	freq
0	Plaza	0.2
1	Rental Service	0.2
2	Cable Car	0.2
3	Park	0.2
4	South American Restaurant	0.2

## ----El Corazón----

	lugar	freq
0	Ice Cream Shop	0.33
1	Coffee Shop	0.17
2	Art Gallery	0.17
3	Café	0.17
4	Scenic Lookout	0.17

## ----El Danubio----

	lugar	freq
0	Convenience Store	0.08
1	Restaurant	0.08
2	Fried Chicken Joint	0.08
3	Burger Joint	0.08
4	Street Art	0.08

----El Diamante----

	lugar	freq
0	Wings Joint	1.0
1	Advertising Agency	0.0
2	Outdoor Event Space	0.0
3	Multiplex	0.0
4	Museum	0.0

----El Diamante No.2----

	lugar	freq
0	Shopping Mall	0.09
1	Bakery	0.09
2	Supermarket	0.09
3	Hotel	0.05
4	Peruvian Restaurant	0.05

----El Pesebre----

	lugar	freq
0	Gym / Fitness Center	0.22
1	Convenience Store	0.11
2	Park	0.11
3	Sandwich Place	0.11
4	Shopping Mall	0.11

----El Pinal----

	lugar	freq
0	Comfort Food Restaurant	0.25
1	Shopping Mall	0.25
2	Gym / Fitness Center	0.25
3	Multiplex	0.25
4	Advertising Agency	0.00

----El Poblado----

	lugar	freq
0	Café	0.14
1	Restaurant	0.06
2	Cocktail Bar	0.06
3	Argentinian Restaurant	0.04
4	Coffee Shop	0.04

----El Pomar----

	lugar	freq
0	Plaza	0.14
1	History Museum	0.14
2	Shopping Mall	0.14
3	Park	0.14
4	Gym / Fitness Center	0.14

----El Progreso----

	lugar	freq
0	Sandwich Place	0.09
1	BBQ Joint	0.09
2	Shopping Mall	0.09
3	Advertising Agency	0.04
4	Mobile Phone Shop	0.04

## ----El Raizal----

	lugar	freq
0	Ice Cream Shop	0.25
1	Scenic Lookout	0.25
2	Diner	0.25
3	Park	0.25
4	Music Store	0.00

## ----El Rincón----

	lugar	freq
0	Gun Range	0.17
1	Club House	0.17
2	Market	0.17
3	Gym	0.17
4	Bakery	0.17

## ----El Rodeo----

	lugar	freq
0	Market	0.17
1	Gun Range	0.17
2	Plaza	0.17
3	Gym	0.17
4	Bakery	0.17

## ----El Salvador----

	lugar	freq
0	Park	0.17
1	Department Store	0.17
2	Steakhouse	0.08
3	Arepas Restaurant	0.08
4	Supermarket	0.08

## ----El Socorro----

	lugar	freq
0	Soccer Field	0.2
1	Burger Joint	0.2
2	Street Art	0.2
3	General Entertainment	0.2
4	Cable Car	0.2

## ----El Tesoro----

	lugar	freq
0	Shopping Mall	0.08
1	Clothing Store	0.06
2	Café	0.06
3	Supermarket	0.06
4	Frozen Yogurt Shop	0.04

## ----El Triunfo----

	lugar	freq
0	Mountain	0.5
1	Scenic Lookout	0.5
2	Movie Theater	0.0
3	Museum	0.0
4	Music Store	0.0

## ----El Velódromo----

	lugar	freq
0	Athletics & Sports	0.07
1	Supermarket	0.04

2	Burger Joint	0.04
3	Sandwich Place	0.04
4	Pizza Place	0.04

## ----Enciso----

		lugar	freq
0		Plaza	0.2
1	South American Restaurant		0.1
2	Comfort Food Restaurant		0.1
3		Steakhouse	0.1
4		Bus Station	0.1

## ----Estación Villa----

		lugar	freq
0		Plaza	0.09
1	Shopping Mall		0.06
2	Soccer Field		0.06
3	Department Store		0.06
4		Hotel	0.06

## ----Estadio----

		lugar	freq
0	Ice Cream Shop		0.07
1		Hotel	0.07
2	Grocery Store		0.07
3	Soccer Stadium		0.05
4		Juice Bar	0.05

## ----Ferrini----

		lugar	freq
0	Ice Cream Shop		0.14
1		Juice Bar	0.10
2	Grocery Store		0.10
3	Gym / Fitness Center		0.10
4		Burger Joint	0.05

## ----Florencia----

		lugar	freq
0	Ice Cream Shop		0.17
1	BBQ Joint		0.17
2	Burger Joint		0.17
3	Restaurant		0.17
4	Cocktail Bar		0.17

## ----Florida Nueva----

		lugar	freq
0	Italian Restaurant		0.10
1		Café	0.08
2	Burger Joint		0.06
3		Bakery	0.06
4		Stadium	0.04

		lugar	freq
0	Sandwich Place		0.17
1	Fish & Chips Shop		0.17
2	Fast Food Restaurant		0.17
3	Dessert Shop		0.17
4	Shopping Mall		0.17

## ----Fuente Clara----

	lugar	freq
0	Farmers Market	0.5
1	Bar	0.5
2	Advertising Agency	0.0
3	Outdoor Event Space	0.0
4	Music Store	0.0

----Fátima----

	lugar	freq
0	Bar	0.08
1	Supermarket	0.06
2	Park	0.06
3	Burger Joint	0.06
4	Café	0.06

----Gerona----

	lugar	freq
0	Bar	0.14
1	Food Court	0.07
2	Seafood Restaurant	0.07
3	Supermarket	0.07
4	Café	0.07

----Girardot----

	lugar	freq
0	Convenience Store	0.17
1	Recreation Center	0.17
2	Gym	0.17
3	Farm	0.17
4	Tennis Court	0.17

----Granada----

	lugar	freq
0	Gym	0.14
1	Burger Joint	0.14
2	Soccer Stadium	0.07
3	Steakhouse	0.07
4	Bakery	0.07

----Granizal----

	lugar	freq
0	Cable Car	0.4
1	Plaza	0.2
2	Rental Service	0.2
3	South American Restaurant	0.2
4	Outdoor Event Space	0.0

----Guayabal----

	lugar	freq
0	Sandwich Place	0.12
1	Restaurant	0.12
2	Intersection	0.06
3	Colombian Restaurant	0.06
4	Fried Chicken Joint	0.06

----Guayaquil----

	lugar	freq
0	Plaza	0.08
1	Café	0.08
2	Restaurant	0.06
3	Shopping Mall	0.06
4	Clothing Store	0.06

## ----Héctor Abad Gómez----

		lugar	freq
0	Metro Station	0.25	
1	Clothing Store	0.25	
2	Park	0.25	
3	Cable Car	0.25	
4	Advertising Agency	0.00	

## ----Jardín Botánico----

		lugar	freq
0	Café	0.17	
1	Theme Park	0.08	
2	Multiplex	0.04	
3	Planetarium	0.04	
4	Concert Hall	0.04	

## ----Jesús Nazareno----

		lugar	freq
0	Sandwich Place	0.14	
1	Café	0.10	
2	Department Store	0.05	
3	Restaurant	0.05	
4	Soccer Field	0.05	

## ----Juan Pablo II----

		lugar	freq
0	Cable Car	0.5	
1	BBQ Joint	0.5	
2	Advertising Agency	0.0	
3	Outdoor Event Space	0.0	
4	Music Store	0.0	

## ----Juan XXIII La Quiebra----

		lugar	freq
0	Soccer Field	0.33	
1	Ski Trail	0.33	
2	Cable Car	0.33	
3	Advertising Agency	0.00	
4	Other Repair Shop	0.00	

## ----Kennedy----

		lugar	freq
0	Soccer Field	0.5	
1	Wings Joint	0.5	
2	Advertising Agency	0.0	
3	Outdoor Event Space	0.0	
4	Museum	0.0	

## ----La Aguacatala----

		lugar	freq
0	Hotel	0.10	
1	Salad Place	0.06	
2	Café	0.06	
3	Creperie	0.04	
4	Supermarket	0.04	

## ----La Alpujarra----

		lugar	freq
0	Clothing Store	0.08	
1	Restaurant	0.08	

```
2 Shopping Mall 0.06
3 Café 0.06
4 Metro Station 0.06
```

----La América----

	lugar	freq
0	Supermarket	0.12
1	Burger Joint	0.09
2	Restaurant	0.09
3	Shopping Mall	0.06
4	Café	0.06

----La Avanzada----

	lugar	freq
0	Plaza	0.25
1	Cable Car	0.25
2	Liquor Store	0.25
3	South American Restaurant	0.25
4	Outdoor Event Space	0.00

----La Candelaria----

	lugar	freq
0	Sandwich Place	0.10
1	Bar	0.06
2	Plaza	0.06
3	Art Museum	0.04
4	Pizza Place	0.04

----La Castellana----

	lugar	freq
0	Bar	0.08
1	Pizza Place	0.08
2	Café	0.08
3	Sandwich Place	0.06
4	Restaurant	0.04

----La Colina----

	lugar	freq
0	Diner	0.14
1	Burger Joint	0.14
2	Park	0.14
3	Salad Place	0.14
4	Shopping Mall	0.14

----La Cruz----

	lugar	freq
0	Food Truck	0.33
1	Pedestrian Plaza	0.33
2	Ice Cream Shop	0.33
3	Pizza Place	0.00
4	Pier	0.00

----La Esperanza----

	lugar	freq
0	Construction & Landscaping	0.25
1	Business Service	0.25
2	Other Repair Shop	0.25
3	Gym	0.25
4	Paper / Office Supplies Store	0.00

----La Esperanza No.2----

	lugar	freq
0	Construction & Landscaping	0.25
1	Plaza	0.25
2	Cable Car	0.25
3	South American Restaurant	0.25
4	Pier	0.00

## ----La Floresta----

	lugar	freq
0	Supermarket	0.12
1	Metro Station	0.08
2	Fast Food Restaurant	0.08
3	Hotel	0.08
4	Park	0.08

## ----La Florida----

	lugar	freq
0	Peruvian Restaurant	0.06
1	Bar	0.06
2	Cocktail Bar	0.06
3	Breakfast Spot	0.04
4	Mexican Restaurant	0.04

## ----La Francia----

	lugar	freq
0	Metro Station	0.5
1	Cable Car	0.5
2	Advertising Agency	0.0
3	Outdoor Event Space	0.0
4	Music Store	0.0

## ----La Frontera----

	lugar	freq
0	Coffee Shop	0.25
1	Metro Station	0.25
2	Cable Car	0.25
3	BBQ Joint	0.25
4	Advertising Agency	0.00

## ----La Gloria----

	lugar	freq
0	Park	0.25
1	BBQ Joint	0.12
2	Ice Cream Shop	0.12
3	Pizza Place	0.12
4	Burger Joint	0.12

## ----La Hondonada----

	lugar	freq
0	Kids Store	0.33
1	Bakery	0.33
2	Market	0.33
3	Advertising Agency	0.00
4	Outdoor Event Space	0.00

## ----La Isla----

	lugar	freq
0	Furniture / Home Store	0.25
1	Fast Food Restaurant	0.25
2	Metro Station	0.25
3	Cable Car	0.25
4	Advertising Agency	0.00

## ----La Ladera----

		lugar	freq
0	Construction & Landscaping	0.25	
1	Comfort Food Restaurant	0.25	
2	Clothing Store	0.25	
3	Park	0.25	
4	Paper / Office Supplies Store	0.00	

## ----La Libertad----

		lugar	freq
0	Multiplex	0.2	
1	Soccer Field	0.2	
2	Shopping Mall	0.2	
3	Tram Station	0.2	
4	Gym / Fitness Center	0.2	

## ----La Loma de Los Bernal----

		lugar	freq
0	Shopping Mall	0.18	
1	Pizza Place	0.12	
2	Italian Restaurant	0.12	
3	Fast Food Restaurant	0.06	
4	Market	0.06	

## ----La Mansión----

		lugar	freq
0	Theater	0.25	
1	Comfort Food Restaurant	0.25	
2	Park	0.25	
3	Sandwich Place	0.25	
4	Advertising Agency	0.00	

## ----La Milagrosa----

		lugar	freq
0	Fried Chicken Joint	0.09	
1	Athletics & Sports	0.09	
2	Ice Cream Shop	0.09	
3	Plaza	0.09	
4	Pizza Place	0.09	

## ----La Mota----

		lugar	freq
0	Shopping Mall	0.16	
1	Supermarket	0.09	
2	Italian Restaurant	0.06	
3	Gym / Fitness Center	0.06	
4	Sandwich Place	0.06	

## ----La Pilarica----

		lugar	freq
0	Food	0.5	
1	BBQ Joint	0.5	
2	Advertising Agency	0.0	
3	Outdoor Event Space	0.0	
4	Music Store	0.0	

## ----La Piñuela----

		lugar	freq
0	Plaza	0.29	
1	Recreation Center	0.14	

2	Fast Food Restaurant	0.14
3	Art Museum	0.14
4	Business Service	0.14

----La Pradera----

	lugar	freq
0	Soccer Field	0.25
1	Street Art	0.25
2	Burger Joint	0.25
3	Cable Car	0.25
4	Advertising Agency	0.00

----La Rosa----

	lugar	freq
0	Plaza	0.25
1	Grocery Store	0.25
2	Fast Food Restaurant	0.25
3	Metro Station	0.25
4	Music Store	0.00

----La Salle----

	lugar	freq
0	Park	0.4
1	Bus Station	0.2
2	Business Service	0.2
3	Café	0.2
4	Advertising Agency	0.0

----La Sierra----

	lugar	freq
0	Campground	0.33
1	Cable Car	0.33
2	BBQ Joint	0.33
3	Museum	0.00
4	Music Venue	0.00

----Lalinde----

	lugar	freq
0	Restaurant	0.10
1	Peruvian Restaurant	0.08
2	Cocktail Bar	0.08
3	Italian Restaurant	0.06
4	Café	0.06

----Las Brisas----

	lugar	freq
0	Ice Cream Shop	0.17
1	Burger Joint	0.17
2	Restaurant	0.17
3	Beer Garden	0.17
4	Bar	0.17

----Las Esmeraldas----

	lugar	freq
0	Plaza	0.4
1	Fast Food Restaurant	0.2
2	Café	0.2
3	Liquor Store	0.2
4	Outdoor Event Space	0.0

----Las Estancias----

	lugar	freq
0	Shoe Store	0.25
1	Tram Station	0.25
2	Hardware Store	0.25
3	Cable Car	0.25
4	Advertising Agency	0.00

----Las Granjas----

	lugar	freq
0	Locksmith	0.25
1	Bus Station	0.25
2	Business Service	0.25
3	Park	0.25
4	Advertising Agency	0.00

----Las Independencias----

	lugar	freq
0	Ice Cream Shop	0.33
1	Coffee Shop	0.17
2	Art Gallery	0.17
3	Café	0.17
4	Scenic Lookout	0.17

----Las Lomas No.1----

	lugar	freq
0	Restaurant	0.10
1	Peruvian Restaurant	0.08
2	Latin American Restaurant	0.06
3	Italian Restaurant	0.04
4	Cocktail Bar	0.04

----Las Lomas No.2----

	lugar	freq
0	Hotel	0.14
1	Shopping Mall	0.08
2	Burger Joint	0.06
3	Gym / Fitness Center	0.06
4	Gym	0.06

----Las Mercedes----

	lugar	freq
0	Sandwich Place	0.09
1	Italian Restaurant	0.06
2	Theater	0.06
3	Pizza Place	0.06
4	Café	0.06

----Las Playas----

	lugar	freq
0	Shopping Mall	0.13
1	Fast Food Restaurant	0.13
2	Italian Restaurant	0.06
3	Pharmacy	0.06
4	Pizza Place	0.06

----Las Violetas----

	lugar	freq
0	Sandwich Place	0.2
1	Theater	0.2
2	Fast Food Restaurant	0.2
3	Park	0.2
4	Café	0.2

## ----Laureles----

		lugar	freq
0	Burger Joint	0.08	
1	Mexican Restaurant	0.08	
2	Italian Restaurant	0.06	
3	Peruvian Restaurant	0.06	
4	Bakery	0.04	

## ----Llanaditas----

		lugar	freq
0	Home Service	0.25	
1	Shopping Mall	0.25	
2	Cable Car	0.25	
3	Scenic Lookout	0.25	
4	Advertising Agency	0.00	

## ----Lorena----

		lugar	freq
0	Mexican Restaurant	0.08	
1	Peruvian Restaurant	0.06	
2	Sushi Restaurant	0.06	
3	Restaurant	0.06	
4	Burger Joint	0.06	

## ----Loreto----

		lugar	freq
0	Plaza	0.25	
1	Cocktail Bar	0.25	
2	Department Store	0.25	
3	Supermarket	0.25	
4	Outlet Mall	0.00	

## ----Los Alcázares----

		lugar	freq
0	Café	0.11	
1	Burger Joint	0.11	
2	Fast Food Restaurant	0.11	
3	Metro Station	0.11	
4	Park	0.05	

## ----Los Alpes----

		lugar	freq
0	Pizza Place	0.14	
1	Burger Joint	0.08	
2	Sandwich Place	0.08	
3	Fast Food Restaurant	0.08	
4	Italian Restaurant	0.06	

## ----Los Balsos No.1----

		lugar	freq
0	Bakery	0.13	
1	Burger Joint	0.09	
2	Pizza Place	0.09	
3	Restaurant	0.09	
4	BBQ Joint	0.04	

## ----Los Balsos No.2----

		lugar	freq
0	Café	0.08	
1	Pizza Place	0.06	

2	Ice Cream Shop	0.06
3	Shopping Mall	0.06
4	Hotel	0.06

----Los Cerros El Vergel----

	lugar	freq
0	Tram Station	0.25
1	Pizza Place	0.12
2	Soccer Field	0.12
3	Women's Store	0.12
4	Ice Cream Shop	0.12

----Los Colores----

	lugar	freq
0	Shopping Mall	0.09
1	Grocery Store	0.09
2	Ice Cream Shop	0.09
3	Café	0.06
4	Fast Food Restaurant	0.06

----Los Conquistadores----

	lugar	freq
0	Café	0.08
1	Restaurant	0.08
2	Fast Food Restaurant	0.04
3	Bar	0.04
4	Park	0.04

----Los Mangos----

	lugar	freq
0	Construction & Landscaping	0.25
1	Home Service	0.25
2	Nursery School	0.25
3	Cable Car	0.25
4	Paper / Office Supplies Store	0.00

----Los Naranjos----

	lugar	freq
0	Clothing Store	0.08
1	Burger Joint	0.08
2	Italian Restaurant	0.06
3	Café	0.06
4	Shopping Mall	0.06

----Los Pinos----

	lugar	freq
0	Mexican Restaurant	0.06
1	Pizza Place	0.06
2	Gym	0.06
3	Park	0.06
4	Restaurant	0.06

----Los Ángeles----

	lugar	freq
0	Sandwich Place	0.08
1	Pizza Place	0.06
2	Bar	0.06
3	Plaza	0.06
4	Theater	0.06

----López de Mesa----

	lugar	freq
0	Wings Joint	0.33
1	Breakfast Spot	0.33
2	Coffee Shop	0.33
3	Advertising Agency	0.00
4	Outlet Mall	0.00

----Manila----

	lugar	freq
0	Café	0.10
1	Hotel	0.08
2	Restaurant	0.06
3	Argentinian Restaurant	0.06
4	Park	0.04

----Manrique Central No.1----

	lugar	freq
0	Plaza	0.14
1	Recreation Center	0.14
2	Cemetery	0.14
3	Gym / Fitness Center	0.14
4	Shopping Mall	0.14

----Manrique Central No.2----

	lugar	freq
0	Park	0.22
1	Department Store	0.11
2	Shopping Mall	0.11
3	Gym / Fitness Center	0.11
4	Clothing Store	0.11

----Manrique Oriental----

	lugar	freq
0	Park	0.33
1	Comfort Food Restaurant	0.17
2	Department Store	0.17
3	Shopping Mall	0.17
4	Gym / Fitness Center	0.17

----María Cano-Caramolas----

	lugar	freq
0	Grocery Store	0.2
1	French Restaurant	0.2
2	Rental Service	0.2
3	Restaurant	0.2
4	Park	0.2

----Metropolitano----

	lugar	freq
0	Soccer Field	0.50
1	Shopping Mall	0.25
2	Cable Car	0.25
3	Advertising Agency	0.00
4	Other Repair Shop	0.00

----Mirador del Doce----

	lugar	freq
0	Playground	0.2
1	Mountain	0.2
2	Soccer Field	0.2
3	Recreation Center	0.2
4	Scenic Lookout	0.2

## ----Miraflores----

		lugar	freq
0	Pizza Place	0.08	
1	Bus Station	0.08	
2	Supermarket	0.08	
3	Athletics & Sports	0.08	
4	Shopping Mall	0.08	

## ----Miranda----

		lugar	freq
0	Theme Park	0.13	
1	Café	0.13	
2	Art Museum	0.07	
3	Multiplex	0.07	
4	Botanical Garden	0.07	

## ----Miravalle----

		lugar	freq
0	Bar	0.08	
1	Pizza Place	0.06	
2	Burger Joint	0.06	
3	Café	0.06	
4	Steakhouse	0.04	

## ----Moravia----

		lugar	freq
0	Plaza	0.12	
1	Convenience Store	0.12	
2	Theme Park	0.12	
3	Donut Shop	0.12	
4	Recreation Center	0.12	

## ----Moscú No.1----

		lugar	freq
0	Cable Car	0.50	
1	Fast Food Restaurant	0.25	
2	Park	0.25	
3	Advertising Agency	0.00	
4	Outdoor Event Space	0.00	

## ----Moscú No.2----

		lugar	freq
0	Rental Service	0.17	
1	Business Service	0.17	
2	Park	0.17	
3	Cable Car	0.17	
4	Medical Supply Store	0.17	

## ----Nueva Villa de La Iguaná----

		lugar	freq
0	Gym	0.09	
1	Italian Restaurant	0.06	
2	Pizza Place	0.06	
3	Bakery	0.06	
4	Hotel	0.06	

## ----Nueva Villa del Aburrá----

		lugar	freq
0	Café	0.08	
1	Bar	0.08	

2	Pizza Place	0.08
3	Sandwich Place	0.06
4	Burger Joint	0.04

----Nuevos Conquistadores----

	lugar	freq
0	Ice Cream Shop	0.33
1	Coffee Shop	0.17
2	Art Gallery	0.17
3	Café	0.17
4	Scenic Lookout	0.17

----Ocho de Marzo----

	lugar	freq
0	Cable Car	0.5
1	BBQ Joint	0.5
2	Advertising Agency	0.0
3	Outdoor Event Space	0.0
4	Music Store	0.0

----Olaya Herrera----

	lugar	freq
0	Pharmacy	0.33
1	Burger Joint	0.33
2	Cable Car	0.33
3	Advertising Agency	0.00
4	Outdoor Event Space	0.00

----Oriente----

	lugar	freq
0	Betting Shop	0.33
1	Soccer Field	0.33
2	Park	0.33
3	Advertising Agency	0.00
4	Outdoor Event Space	0.00

----Pablo VI----

	lugar	freq
0	Furniture / Home Store	0.25
1	Clothing Store	0.25
2	Metro Station	0.25
3	Cable Car	0.25
4	Advertising Agency	0.00

----Palenque----

	lugar	freq
0	Gym / Fitness Center	0.33
1	Fried Chicken Joint	0.17
2	Big Box Store	0.17
3	Motel	0.17
4	Park	0.17

----Palermo----

	lugar	freq
0	Plaza	0.29
1	Recreation Center	0.29
2	Fast Food Restaurant	0.14
3	Metro Station	0.14
4	Grocery Store	0.14

----Parque Juan Pablo II----

	lugar	freq
0	Fast Food Restaurant	0.12
1	BBQ Joint	0.06
2	Grocery Store	0.06
3	Food	0.06
4	Seafood Restaurant	0.06

-----Parque Norte-----

	lugar	freq
0	Café	0.20
1	Theme Park	0.10
2	Convenience Store	0.05
3	Planetarium	0.05
4	Concert Hall	0.05

-----Patio Bonito-----

	lugar	freq
0	Café	0.22
1	Hotel	0.12
2	Coffee Shop	0.06
3	Cocktail Bar	0.04
4	Creperie	0.04

-----Pedregal-----

	lugar	freq
0	Recreation Center	0.25
1	Business Service	0.25
2	Gym	0.25
3	Other Repair Shop	0.25
4	Advertising Agency	0.00

-----Perpetuo Socorro-----

	lugar	freq
0	Sandwich Place	0.08
1	Shopping Mall	0.06
2	Café	0.04
3	Metro Station	0.04
4	Men's Store	0.04

-----Picachito-----

	lugar	freq
0	Playground	0.33
1	Athletics & Sports	0.33
2	Scenic Lookout	0.33
3	Outlet Mall	0.00
4	Music Store	0.00

-----Playón de Los Comuneros-----

	lugar	freq
0	IT Services	0.33
1	Coffee Shop	0.33
2	BBQ Joint	0.33
3	Outlet Mall	0.00
4	Music Store	0.00

-----Popular-----

	lugar	freq
0	Furniture / Home Store	0.25
1	Metro Station	0.25
2	Cable Car	0.25
3	Other Repair Shop	0.25
4	Advertising Agency	0.00

## ----Prado----

	lugar	freq
0	Shopping Mall	0.13
1	Café	0.09
2	Sandwich Place	0.09
3	Restaurant	0.09
4	Dessert Shop	0.04

## ----Progreso No.2----

	lugar	freq
0	Playground	0.25
1	Mountain	0.25
2	Soccer Field	0.25
3	Scenic Lookout	0.25
4	Multiplex	0.00

## ----Robledo----

	lugar	freq
0	Gym / Fitness Center	0.33
1	Fried Chicken Joint	0.17
2	Big Box Store	0.17
3	Shopping Mall	0.17
4	Park	0.17

## ----Rosales----

	lugar	freq
0	Burger Joint	0.10
1	Italian Restaurant	0.06
2	Gym / Fitness Center	0.04
3	Café	0.04
4	Coffee Shop	0.04

## ----San Antonio----

	lugar	freq
0	Tram Station	0.50
1	Women's Store	0.25
2	Soccer Field	0.25
3	Advertising Agency	0.00
4	Other Repair Shop	0.00

## ----San Benito----

	lugar	freq
0	Café	0.07
1	Soccer Field	0.07
2	Art Museum	0.07
3	Bakery	0.03
4	Bus Station	0.03

## ----San Bernardo----

	lugar	freq
0	Gym	0.12
1	Fast Food Restaurant	0.12
2	BBQ Joint	0.06
3	Pizza Place	0.06
4	Bus Station	0.06

## ----San Diego----

	lugar	freq
0	Sandwich Place	0.12
1	Italian Restaurant	0.06

2	Metro Station	0.06
3	Gym	0.06
4	Shopping Mall	0.06

## ----San Germán----

	lugar	freq
0	Shopping Mall	0.15
1	Gym / Fitness Center	0.15
2	Sandwich Place	0.08
3	Mexican Restaurant	0.08
4	Italian Restaurant	0.08

## ----San Javier No.1----

	lugar	freq
0	Soccer Field	0.2
1	Burger Joint	0.2
2	Street Art	0.2
3	General Entertainment	0.2
4	Park	0.2

## ----San Javier No.2----

	lugar	freq
0	Soccer Field	0.25
1	Burger Joint	0.25
2	Street Art	0.25
3	General Entertainment	0.25
4	Advertising Agency	0.00

## ----San Joaquín----

	lugar	freq
0	Italian Restaurant	0.08
1	Café	0.08
2	Hotel	0.08
3	Ice Cream Shop	0.06
4	Restaurant	0.06

## ----San José La Cima No.1----

	lugar	freq
0	Grocery Store	0.2
1	French Restaurant	0.2
2	Rental Service	0.2
3	Restaurant	0.2
4	Park	0.2

## ----San José La Cima No.2----

	lugar	freq
0	Rental Service	0.2
1	Antique Shop	0.2
2	Park	0.2
3	Grocery Store	0.2
4	Soccer Field	0.2

## ----San Lucas----

	lugar	freq
0	Bakery	0.14
1	Deli / Bodega	0.07
2	Restaurant	0.07
3	Shopping Mall	0.07
4	Frozen Yogurt Shop	0.03

## ----San Martín de Porres----

	lugar	freq
0	Laundromat	0.5
1	Soccer Field	0.5
2	Outdoor Event Space	0.0
3	Museum	0.0
4	Music Store	0.0

----San Miguel----

	lugar	freq
0	Plaza	0.12
1	BBQ Joint	0.06
2	Latin American Restaurant	0.06
3	Factory	0.06
4	Steakhouse	0.06

----San Pablo----

	lugar	freq
0	Park	0.50
1	Plaza	0.25
2	Cable Car	0.25
3	Outdoor Event Space	0.00
4	Museum	0.00

----San Pedro----

	lugar	freq
0	Café	0.17
1	Shopping Mall	0.07
2	Garden Center	0.03
3	Cemetery	0.03
4	Supermarket	0.03

----Santa Cruz----

	lugar	freq
0	Metro Station	0.33
1	Fast Food Restaurant	0.17
2	Farm	0.17
3	Cable Car	0.17
4	Grocery Store	0.17

----Santa Fé----

	lugar	freq
0	BBQ Joint	0.15
1	Cosmetics Shop	0.07
2	Bakery	0.07
3	Food Court	0.04
4	Park	0.04

----Santa Inés----

	lugar	freq
0	Locksmith	0.2
1	Ice Cream Shop	0.2
2	Soccer Field	0.2
3	Antique Shop	0.2
4	Diner	0.2

----Santa Lucía----

	lugar	freq
0	Soccer Field	0.12
1	Restaurant	0.12
2	Cable Car	0.12
3	Gym	0.12
4	Burger Joint	0.12

## ----Santa Margarita----

		lugar	freq
0	Cable Car	0.67	
1	Arepas Restaurant	0.33	
2	Advertising Agency	0.00	
3	Outlet Mall	0.00	
4	Music Store	0.00	

## ----Santa María de Los Ángeles----

		lugar	freq
0	Hotel	0.11	
1	Latin American Restaurant	0.07	
2	Shopping Mall	0.07	
3	Bakery	0.07	
4	Burger Joint	0.04	

## ----Santa Mónica----

		lugar	freq
0	BBQ Joint	0.29	
1	Ice Cream Shop	0.14	
2	Pizza Place	0.14	
3	Museum	0.14	
4	Fast Food Restaurant	0.14	

## ----Santa Rosa de Lima----

		lugar	freq
0	Coffee Shop	0.33	
1	Pharmacy	0.33	
2	Shopping Mall	0.33	
3	Advertising Agency	0.00	
4	Outdoor Event Space	0.00	

## ----Santa Teresita----

		lugar	freq
0	BBQ Joint	0.25	
1	Food Truck	0.12	
2	Pizza Place	0.12	
3	Pharmacy	0.12	
4	Food & Drink Shop	0.12	

## ----Santander----

		lugar	freq
0	Soccer Field	0.5	
1	Recreation Center	0.5	
2	Advertising Agency	0.0	
3	Outdoor Event Space	0.0	
4	Museum	0.0	

## ----Santo Domingo Savio No.1----

		lugar	freq
0	Plaza	0.25	
1	Cable Car	0.25	
2	Liquor Store	0.25	
3	South American Restaurant	0.25	
4	Outdoor Event Space	0.00	

## ----Santo Domingo Savio No.2----

		lugar	freq
0	Caribbean Restaurant	0.17	
1	Plaza	0.17	

2	Cable Car	0.17
3	Bar	0.17
4	Liquor Store	0.17

## ----Sevilla----

	lugar	freq
0	Café	0.13
1	Theme Park	0.10
2	Restaurant	0.03
3	Bus Station	0.03
4	Metro Station	0.03

## ----Simón Bolívar----

	lugar	freq
0	Bakery	0.06
1	Pizza Place	0.06
2	Restaurant	0.06
3	Gym	0.04
4	Café	0.04

## ----Sucre----

	lugar	freq
0	Plaza	0.07
1	Tram Station	0.07
2	Caribbean Restaurant	0.07
3	Seafood Restaurant	0.07
4	Park	0.07

## ----Suramericana----

	lugar	freq
0	Restaurant	0.06
1	Hotel	0.06
2	Pizza Place	0.06
3	BBQ Joint	0.06
4	Sandwich Place	0.06

## ----Tejelo----

	lugar	freq
0	Ice Cream Shop	0.50
1	Burger Joint	0.25
2	Bar	0.25
3	Advertising Agency	0.00
4	Outdoor Event Space	0.00

## ----Tenche----

	lugar	freq
0	Bakery	0.11
1	Pet Store	0.11
2	Historic Site	0.05
3	Supermarket	0.05
4	Park	0.05

## ----Toscana----

	lugar	freq
0	Tennis Court	0.14
1	Metro Station	0.14
2	Construction & Landscaping	0.14
3	Grocery Store	0.14
4	Gym	0.14

## ----Trece de Noviembre----

	lugar	freq
0	Scenic Lookout	0.33
1	Park	0.33
2	Cable Car	0.33
3	Advertising Agency	0.00
4	Music Store	0.00

## ----Tricentenario----

	lugar	freq
0	Grocery Store	0.2
1	Recreation Center	0.2
2	Metro Station	0.2
3	Farm	0.2
4	Tennis Court	0.2

## ----Trinidad----

	lugar	freq
0	BBQ Joint	0.17
1	Zoo	0.08
2	Supermarket	0.08
3	Pizza Place	0.08
4	Bakery	0.08

## ----U.D. Atanasio Girardot----

	lugar	freq
0	Gym	0.08
1	Athletics & Sports	0.06
2	Sandwich Place	0.06
3	Hotel	0.06
4	Bakery	0.04

## ----Universidad Nacional----

	lugar	freq
0	Pizza Place	0.10
1	Bar	0.05
2	Colombian Restaurant	0.05
3	Café	0.05
4	Plaza	0.05

## ----Universidad de Antioquia----

	lugar	freq
0	Café	0.17
1	Theme Park	0.08
2	Planetarium	0.04
3	Museum	0.04
4	Multiplex	0.04

## ----Veinte de Julio----

	lugar	freq
0	Ice Cream Shop	0.2
1	Street Art	0.1
2	Coffee Shop	0.1
3	Café	0.1
4	Burger Joint	0.1

## ----Versalles No.1----

	lugar	freq
0	Sandwich Place	0.10
1	Bar	0.06
2	Plaza	0.06
3	Art Museum	0.04
4	Italian Restaurant	0.04

## ----Versalles No.2----

		lugar	freq
0	Ice Cream Shop	0.33	
1	Other Great Outdoors	0.33	
2	Scenic Lookout	0.33	
3	Movie Theater	0.00	
4	Museum	0.00	

## ----Villa Carlota----

		lugar	freq
0	Gym	0.08	
1	Italian Restaurant	0.06	
2	Hotel	0.06	
3	BBQ Joint	0.06	
4	Bistro	0.04	

## ----Villa Flora----

		lugar	freq
0	Gym / Fitness Center	0.4	
1	Fried Chicken Joint	0.2	
2	Big Box Store	0.2	
3	Park	0.2	
4	Advertising Agency	0.0	

## ----Villa Guadalupe----

		lugar	freq
0	Food & Drink Shop	0.25	
1	Fast Food Restaurant	0.25	
2	Park	0.25	
3	Café	0.25	
4	Advertising Agency	0.00	

## ----Villa Hermosa----

		lugar	freq
0	Park	0.50	
1	Comfort Food Restaurant	0.25	
2	Clothing Store	0.25	
3	Outlet Mall	0.00	
4	Music Store	0.00	

## ----Villa Lilliam----

		lugar	freq
0	Women's Store	0.2	
1	Tram Station	0.2	
2	Shoe Store	0.2	
3	Cable Car	0.2	
4	Park	0.2	

## ----Villa Niza----

		lugar	freq
0	Metro Station	0.29	
1	Grocery Store	0.14	
2	Recreation Center	0.14	
3	Farm	0.14	
4	Cable Car	0.14	

## ----Villa Nueva----

		lugar	freq
0	Sandwich Place	0.12	
1	Gastropub	0.04	

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2          Plaza  0.04
3          Bar   0.04
4      BBQ Joint  0.04

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----Villa Turbay----

	lugar	freq
0	Cable Car	1.0
1	Advertising Agency	0.0
2	Multiplex	0.0
3	Music Store	0.0
4	Music Venue	0.0

----Villa del Socorro----

	lugar	freq
0	Cable Car	0.50
1	Fast Food Restaurant	0.25
2	Bakery	0.25
3	Advertising Agency	0.00
4	Outdoor Event Space	0.00

----Villatina----

	lugar	freq
0	Tram Station	0.50
1	Women's Store	0.25
2	Soccer Field	0.25
3	Advertising Agency	0.00
4	Other Repair Shop	0.00

## pongamoslo en el DataFrame

Primero escribamos una función para ordenar los sitios en orden descendente.

```
In [26]: def return_most_common_venues(row, num_top_venues):
    row_categories = row.iloc[1:]
    row_categories_sorted = row_categories.sort_values(ascending=False)

    return row_categories_sorted.index.values[0:num_top_venues]
```

Generemos el nuevo dataframe y mostremos los primeros 10 sitios de cada barrio.

```
In [27]: num_top_venues = 10

indicators = ['st', 'nd', 'rd']

# crear las columnas acorde al numero de sitios populares
columns = ['BARRIO']
for ind in np.arange(num_top_venues):
    try:
        columns.append('{0}{1} Most Common Venue'.format(ind+1, indicators[ind]))
    except:
        columns.append('{0}th Most Common Venue'.format(ind+1))

# crear un nuevo dataframe
neighborhoods_venues_sorted = pd.DataFrame(columns=columns)
neighborhoods_venues_sorted['BARRIO'] = Medellin_grouped['BARRIO']

for ind in np.arange(Medellin_grouped.shape[0]):
    neighborhoods_venues_sorted.iloc[ind, 1:] = return_most_common_venues(Medellin_g

neighborhoods_venues_sorted.head()
```

Out[27]:

	BARRIO	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
0	Aldea Pablo VI	South American Restaurant	Cable Car	Plaza	Park	Rental Service	Fish & Chips Shop	Fast Food Restaurant	Farmers Market
1	Alejandro Echavarría	Soccer Field	Shopping Mall	Bar	Multiplex	Tram Station	Gym / Fitness Center	Ice Cream Shop	Pizza Place
2	Alejandría	Hotel	Café	Shopping Mall	Pizza Place	Salad Place	Bakery	Cocktail Bar	Burger Joint
3	Alfonso López	BBQ Joint	Rest Area	Fast Food Restaurant	Lake	Fried Chicken Joint	Public Art	Donut Shop	Electronics Store
4	Altamira	Wings Joint	Food	BBQ Joint	Zoo	Donut Shop	Food & Drink Shop	Fish & Chips Shop	Fast Food Restaurant

## Agrupemos los barrios, K-Means

In [28]:

```
#Ejecutemos _k_-means para agrupar los barrios en 5 agrupaciones.
# establecer el número de agrupaciones
kclusters = 5
```

In [29]:

```
Medellin_grouped_clustering = Medellin_grouped.drop('BARRIO', 1)

# ejecutar k-means
kmeans = KMeans(n_clusters=kclusters, random_state=0).fit(Medellin_grouped_clustering)

# revisar las etiquetas de las agrupaciones generadas para cada fila del dataframe
kmeans.labels_[0:5]
```

Out[29]: array([4, 0, 0, 0, 0])

Generemos un nuevo dataframe que incluya la agrupación así como los 10 sitios más populares de cada barrio.

In [30]:

```
# añadir etiquetas
neighborhoods_venues_sorted.insert(0, 'Cluster Labels', kmeans.labels_)

Medellin_merged = dfBarrios

# juntar Medellin_grouped con dfBarrios
Medellin_merged = Medellin_merged.join(neighborhoods_venues_sorted.set_index('BARRIO'))

Medellin_merged.head() # revisar las últimas columnas
```

Out[30]:

	barrio	BarrioOVereda	Comuna	lat	lng	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	Aldea Pablo VI		1	Popular	6.28829	-75.5421	4.0	South American Restaurant	Cable Car

	barrio	BarrioOVereda	Comuna	lat	lng	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
1	Alejandro Echavarría	1	Buenos Aires	6.23877	-75.5463	0.0	Soccer Field	Shopping Mall	Bar
2	Alejandría	1	El Poblado	6.19997	-75.569	0.0	Hotel	Café	Shopping Mall
3	Alfonso López	1	Castilla	6.28489	-75.576	0.0	BBQ Joint	Rest Area	Fast Food Restaurant
4	Altamira	1	Robledo	6.27983	-75.5814	0.0	Wings Joint	Food	BBQ Joint

Antes de visualizar las agrupaciones, renombremos una columna, llenamos datos nulos y cambiamos el tipo de dato a entero en la columna ClusterLabels

```
In [31]: Medellin_merged.rename(columns = {'Cluster Labels':'ClusterLabels'}, inplace = True)
Medellin_merged.ClusterLabels = Medellin_merged.ClusterLabels.fillna(9)
Medellin_merged.ClusterLabels = Medellin_merged.ClusterLabels.astype(int)
```

Eliminamos las columnas con datos nulos y verificamos los datos

```
In [32]: indexNames = Medellin_merged[ (Medellin_merged['ClusterLabels'] == 9)].index
Medellin_merged.drop(indexNames, inplace=True)
Medellin_merged.head(5)
```

Out[32]:

	barrio	BarrioOVereda	Comuna	lat	lng	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	Aldea Pablo VI	1	Popular	6.28829	-75.5421	4	South American Restaurant	Cable Car	F
1	Alejandro Echavarría	1	Buenos Aires	6.23877	-75.5463	0	Soccer Field	Shopping Mall	
2	Alejandría	1	El Poblado	6.19997	-75.569	0	Hotel	Café	Shop
3	Alfonso López	1	Castilla	6.28489	-75.576	0	BBQ Joint	Rest Area	Fast F Restau
4	Altamira	1	Robledo	6.27983	-75.5814	0	Wings Joint	Food	BBQ .

Despues de ajustar el formato de nuestros datos, procedemos a visualizar las agrupaciones resultantes

```
In [62]: #crear mapa
map_clusters = folium.Map(location=[latitude, longitude], zoom_start=12)

# establecer el esquema de color para las agrupaciones
x = np.arange(kclusters)
ys = [i + x + (i*x)**2 for i in range(kclusters)]
colors_array = cm.rainbow(np.linspace(0, 1, len(ys)))
rainbow = [colors.rgb2hex(i) for i in colors_array]

# añadir marcadores al mapa
markers_colors = []
for lat, lon, poi, cluster in zip(Medellin_merged['lat'], Medellin_merged['lng'], Me
    label = folium.Popup(str(poi) + ' Cluster ' + str(cluster), parse_html=True)
    folium.CircleMarker(
        [lat, lon],
        radius=5,
        popup=label,
        color=rainbow[cluster-1],
        fill=True,
        fill_color=rainbow[cluster-1],
        fill_opacity=0.7).add_to(map_clusters)

map_clusters
```

Out[62]: Make this Notebook Trusted to load map: File -> Trust Notebook

## Barrios donde es mas comun las pizzerias.

```
In [58]: # visualicemos Los barrios con mas pizzerias en La ciudad
Barrio_Con_Pizzerias = Medellin_venues[Medellin_venues['SITIO Category'] =='Pizza Pl
Barrio_Con_Pizzerias['BARRIO'].value_counts()
```

Out[58]:	Los Alpes	5
	Nueva Villa del Aburrá	4
	La Castellana	4
	Boston	3
	Los Pinos	3
	Simón Bolívar	3
	Los Ángeles	3
	Suramericana	3
	Miravalle	3
	Los Balsos No.2	3
	Alejandría	3
	Las Mercedes	2

La Loma de Los Bernal	2
Nueva Villa de La Iguaná	2
El Velódromo	2
Corazón de Jesús	2
Lorena	2
Versalles No.1	2
Las Playas	2
Barrio Cristóbal	2
Bomboná No.1	2
Los Balsos No.1	2
La Mota	2
Florida Nueva	2
La Florida	2
Universidad Nacional	2
Carlos E. Restrepo	2
La Candelaria	2
Villa Nueva	2
Diego Echavarría	2
Barrio Caicedo	1
Cristo Rey	1
Asomadera No.3	1
San Bernardo	1
Las Lomas No.1	1
Bolivariana	1
Villa Carlota	1
Santa Fé	1
Guayaquil	1
San Miguel	1
Rosales	1
Miraflores	1
Alejandro Echavarría	1
San Benito	1
El Tesoro	1
Los Naranjos	1
Los Colores	1
El Poblado	1
Calasanz	1
Santa Mónica	1
Batallón Cuarta Brigada	1
U.D. Atanasio Girardot	1
Santa Teresita	1
La Milagrosa	1
San Joaquín	1
Manila	1
La Alpujarra	1
El Danubio	1
La Gloria	1
Ferrini	1
Trinidad	1
Las Lomas No.2	1
La América	1
Astorga	1
Los Cerros El Vergel	1
Bomboná No.2	1
La Aguacatala	1
Calasanz Parte Alta	1
Laureles	1
Estadio	1
Calle Nueva	1
Cataluña	1

Name: BARRIO, dtype: int64

observemos que los 5 barrios con mas pizzerias de la ciudad pertenecen al Cluster 0, definitivamente no es un buen lugar para abrir una pizzeria, ya que hay mucha competencia.

```
In [60]: Barrio_Con_Pizzerias1=Medellin_merged.loc[(Medellin_merged['barrio'] == 'Los Alpes')]
Barrio_Con_Pizzerias1
```

Out[60]:

								1st Most Common Venue	2nd Most Common Venue	3rd C
	barrio	BarrioOVereda	Comuna	lat	lng	ClusterLabels				
35	Boston		1 La Candelaria	6.24804	-75.5576		0	Bar	Plaza	
110	La Castellana		1 Laureles Estadio	6.24023	-75.6054		0	Bar	Café	
150	Los Alpes		1 Belén	6.2309	-75.6076		0	Pizza Place	Fast Food Restaurant	S
158	Los Pinos		1 La América	6.25205	-75.599		0	Pizza Place	Restaurant	
176	Nueva Villa del Aburrá		1 Belén	6.23566	-75.6043		0	Bar	Café	

## 4. Metodología

Se utilizo la base de datos de la alcaldia de medellin de barrios y veredas, que esta disponible en la pagina web Geo Medellin, esta base de datos, contiene los datos demograficos de los barrios y comunas del area metropolitana de la ciudad.

Posteriormente se hizo todo el tratamiento de los datos, limpieza de datos, organizacion y formato de los datos.

Despues se utilizo la libreria **GeoPy**, para obtener los valores de latitud y longitud, de cada uno de los barrios del dataframe. Ademas con los datos Geoespaciales obtenidos de GeoPy, se procedio a hacer llamados a la Api de **Foursquare** para consultar el top 10 de los sitios mas comunes para cada barrio.

por ultimo Abordamos el problema utilizando la tecnica de agrupamiento que ya conocemos, **k-means**. Este enfoque permitio a la audiencia ver como los vecindarios se agruparon en 5 Clusters.

## 5. Resultados

### Agrupacion 1

```
In [34]: Mde_group1=Medellin_merged.loc[Medellin_merged['ClusterLabels'] == 0, Medellin_merge  
Mde_group1
```

Out[34]:

	barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comm Ven
1	Alejandro Echavarría	0	Soccer Field	Shopping Mall	Bar	Multiplex	Tram Stat
2	Alejandría	0	Hotel	Café	Shopping Mall	Pizza Place	Salad Pl
3	Alfonso López	0	BBQ Joint	Rest Area	Fast Food Restaurant	Lake	Fried Chic Jc

	barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comn Ven
4	Altamira	0	Wings Joint	Food	BBQ Joint	Zoo	Donut Sl
5	Altos del Poblado	0	Gym / Fitness Center	Hotel	Breakfast Spot	BBQ Joint	Electro St
7	Antonio Nariño	0	Construction & Landscaping	Fast Food Restaurant	Seafood Restaurant	Juice Bar	Do Restaur
8	Aranjuez	0	Shopping Mall	Recreation Center	Sandwich Place	Art Museum	Donut Sl
9	Asomadera No.1	0	Sandwich Place	Nightclub	Gym	Hotel	Steakho
10	Asomadera No.2	0	Hotel	Supermarket	Italian Restaurant	History Museum	Shopping M
11	Asomadera No.3	0	Hotel	Italian Restaurant	Restaurant	Shopping Mall	Supermai
12	Astorga	0	Café	Argentinian Restaurant	Restaurant	Plaza	Ita Restaur
13	Aures No.1	0	Home Service	Cosmetics Shop	Men's Store	Zoo	Donut Sl
14	Aures No.2	0	Athletics & Sports	Home Service	Doner Restaurant	Food & Drink Shop	Fo
15	B. Cerro El Volador	0	BBQ Joint	Mobile Phone Shop	Scenic Lookout	Fast Food Restaurant	As Restaur
16	Barrio Caicedo	0	Bar	Pizza Place	Theater	Park	Pl
17	Barrio Colombia	0	Nightclub	Italian Restaurant	Hotel	Ice Cream Shop	Brew
18	Barrio Colón	0	Sandwich Place	Clothing Store	Shopping Mall	Plaza	Pedest Pl
19	Barrio Cristóbal	0	Gym	Pizza Place	Ice Cream Shop	Fast Food Restaurant	Japan Restaur
21	Batallón Cuarta Brigada	0	Shopping Mall	Ice Cream Shop	Sandwich Place	Gym	Ho
23	Belalcázar	0	Tennis Court	Grocery Store	Farm	Metro Station	Recreat Cer
25	Bello Horizonte	0	Hotel	Wings Joint	Grocery Store	Discount Store	Fo
26	Belén	0	Club House	Pub	Market	Gun Range	C
28	Bermejal-Los Álamos	0	Plaza	Fast Food Restaurant	Art Museum	Convenience Store	Sandv Pl

	barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comn Ven
30	Blanquiza	0	Coffee Shop	Shopping Mall	Zoo	Doner Restaurant	Fo
31	Bolivariana	0	Italian Restaurant	Café	Peruvian Restaurant	Argentinian Restaurant	Mexi Restaur
32	Bomboná No.1	0	Bar	Theater	Sandwich Place	Gastropub	Pizza Pl
34	Bosques de San Pablo	0	Food	Music Store	BBQ Joint	Grocery Store	;
35	Boston	0	Bar	Plaza	Pizza Place	Restaurant	Ita Restaur
37	Brasilia	0	History Museum	Liquor Store	Bakery	Lake	Garden Cer
38	Buenos Aires	0	Bar	Food Court	Department Store	Farmers Market	Seaf Restaur
39	Calasanz	0	Ice Cream Shop	Grocery Store	Hotel	Sandwich Place	Fast Fo Restaur
40	Calasanz Parte Alta	0	Grocery Store	Ice Cream Shop	Fast Food Restaurant	Juice Bar	Pizza Pl
41	Calle Nueva	0	Café	Restaurant	Metro Station	Shopping Mall	Pl
42	Campo Alegre	0	Burger Joint	Convenience Store	General Entertainment	Ice Cream Shop	F
43	Campo Amor	0	Sandwich Place	Plaza	Fast Food Restaurant	Shoe Store	Shopping M
44	Campo Valdés No.1	0	Bakery	Bus Station	Liquor Store	History Museum	Ice Cre SI
45	Campo Valdés No.2	0	Gym / Fitness Center	Gymnastics Gym	Bus Station	Department Store	Shopping M
46	Caribe	0	Playground	Rental Service	Supermarket	Restaurant	BBQ Jo
47	Carlos E. Restrepo	0	Gym	Pizza Place	Seafood Restaurant	Sandwich Place	Bak
48	Carpinelo	0	Liquor Store	Construction & Landscaping	Plaza	Restaurant	Caribb Restaur
49	Castilla	0	Cocktail Bar	Café	Hotel	Bistro	
50	Castropol	0	Hotel	Restaurant	Italian Restaurant	Supermarket	The Restaur

	barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comn Ven
51	Cataluña	0	Construction & Landscaping	Plaza	Ice Cream Shop	Pizza Place	Superma
52	Cerro Nutibara	0	Bar	Metro Station	Historic Site	Theater	Pet St
53	Cerro Nutibara	0	Bar	Metro Station	Historic Site	Theater	Pet St
54	Corazón de Jesús	0	Restaurant	Café	Sandwich Place	Fast Food Restaurant	Pizza Pl
55	Cristo Rey	0	Pizza Place	Plaza	Shopping Mall	Fried Chicken Joint	Salad Pl
56	Cuarta Brigada	0	Gym	Soccer Stadium	Athletics & Sports	Shopping Mall	Seaf Restaur
57	Cucaracho	0	Farmers Market	Bar	Zoo	Electronics Store	Food Cc
58	Córdoba	0	Donut Shop	Convenience Store	Fried Chicken Joint	Shopping Mall	Bus Stat
59	Diego Echavarría	0	Shopping Mall	Supermarket	Italian Restaurant	Gym / Fitness Center	Sandy Pl
62	Ecoparque Cerro El Volador	0	BBQ Joint	Shopping Mall	Grocery Store	Café	Supermai
63	Eduardo Santos	0	Pier	BBQ Joint	Zoo	Donut Shop	Food & D Si
64	El Castillo	0	Supermarket	Hotel	BBQ Joint	Golf Course	Gard
65	El Chagualo	0	Café	Farmers Market	Bar	Supermarket	Shopping M
68	El Danubio	0	Convenience Store	Fried Chicken Joint	Pizza Place	BBQ Joint	Street
69	El Diamante	0	Wings Joint	Zoo	Doner Restaurant	Food & Drink Shop	Food
70	El Diamante No.2	0	Bakery	Shopping Mall	Supermarket	Hotel	L Ameri Restaur
72	El Pinal	0	Comfort Food Restaurant	Multiplex	Shopping Mall	Gym / Fitness Center	Dc Restaur
73	El Poblado	0	Café	Restaurant	Cocktail Bar	Argentinian Restaurant	L Ameri Restaur
75	El Progreso	0	Sandwich Place	Shopping Mall	BBQ Joint	Advertising Agency	Auto Gar

	barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comn Ven
77	El Rincón	0	Club House	Pub	Market	Gun Range	C
78	El Rodeo	0	Club House	Gym	Market	Gun Range	Bak
81	El Tesoro	0	Shopping Mall	Supermarket	Clothing Store	Café	Frozen Yoç SI
83	El Velódromo	0	Athletics & Sports	Restaurant	Sandwich Place	Supermarket	Pizza Pl
85	Estación Villa	0	Plaza	Shopping Mall	Colombian Restaurant	Hotel	Soccer F
86	Estadio	0	Grocery Store	Hotel	Ice Cream Shop	Soccer Stadium	Sandv Pl
87	Ferrini	0	Ice Cream Shop	Grocery Store	Gym / Fitness Center	Juice Bar	Convenie St
88	Florencia	0	Cocktail Bar	Burger Joint	Restaurant	Beer Garden	BBQ Jo
89	Florida Nueva	0	Italian Restaurant	Café	Bakery	Burger Joint	Pizza Pl
90	Francisco Antonio Zea	0	Latin American Restaurant	Fish & Chips Shop	Fast Food Restaurant	Shopping Mall	Dessert SI
91	Fuente Clara	0	Farmers Market	Bar	Zoo	Electronics Store	Food Cc
92	Fátima	0	Bar	Park	Supermarket	Café	Burger Jo
93	Gerona	0	Bar	Food Court	Department Store	Farmers Market	Seaf Restaur
94	Girardot	0	Tennis Court	Gym	Convenience Store	Farm	Recreat Cer
95	Granada	0	Gym	Burger Joint	Fried Chicken Joint	Supermarket	Steakho
97	Guayabal	0	Restaurant	Sandwich Place	Intersection	Café	Di
98	Guayaquil	0	Café	Plaza	Shopping Mall	Restaurant	Clothing St
100	Jardín Botánico	0	Café	Theme Park	Park	Restaurant	Bak
101	Jesús Nazareno	0	Sandwich Place	Café	Gay Bar	Art Museum	Farm Mai
105	La Aguacatala	0	Hotel	Café	Salad Place	Coffee Shop	Ita Restaur
106	La Alpujarra	0	Restaurant	Clothing Store	Metro Station	Shopping Mall	C

	barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comn Ven
107	La América	0	Supermarket	Burger Joint	Restaurant	Café	C
109	La Candelaria	0	Sandwich Place	Bar	Plaza	Art Museum	BBQ Jc
110	La Castellana	0	Bar	Café	Pizza Place	Sandwich Place	Shopping M
111	La Colina	0	Salad Place	Park	Diner	Restaurant	Burger Jc
113	La Esperanza	0	Construction & Landscaping	Other Repair Shop	Gym	Business Service	Fo
115	La Floresta	0	Supermarket	Hotel	Fast Food Restaurant	Park	Metro Sta1
116	La Florida	0	Peruvian Restaurant	Cocktail Bar	Bar	Mexican Restaurant	C
120	La Hondonada	0	Market	Bakery	Kids Store	Zoo	Electroi St
124	La Loma de Los Bernal	0	Shopping Mall	Pizza Place	Italian Restaurant	Park	Sandv Pl
126	La Milagrosa	0	Food Court	Plaza	Supermarket	Athletics & Sports	Departm St
127	La Mota	0	Shopping Mall	Supermarket	Pizza Place	Gym / Fitness Center	Sandv Pl
128	La Pilarica	0	Food	BBQ Joint	Zoo	Electronics Store	Food Co
129	La Piñuela	0	Plaza	Fast Food Restaurant	Recreation Center	Art Museum	Busir Sen
131	La Rosa	0	Plaza	Fast Food Restaurant	Metro Station	Grocery Store	;
134	Lalinde	0	Restaurant	Cocktail Bar	Peruvian Restaurant	Italian Restaurant	H
135	Las Brisas	0	BBQ Joint	Ice Cream Shop	Bar	Restaurant	Burger Jc
136	Las Esmeraldas	0	Plaza	Café	Fast Food Restaurant	Liquor Store	;
140	Las Lomas No.1	0	Restaurant	Peruvian Restaurant	Latin American Restaurant	Hotel	BBQ Jc
141	Las Lomas No.2	0	Hotel	Shopping Mall	Supermarket	Gym / Fitness Center	C

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comn Ven
142		Las Mercedes	0	Sandwich Place	Fast Food Restaurant	Burger Joint	Italian Restaurant	Pizza Pl
143		Las Playas	0	Fast Food Restaurant	Shopping Mall	Pizza Place	Sandwich Place	Ita Restaur
145		Laureles	0	Mexican Restaurant	Burger Joint	Peruvian Restaurant	Italian Restaurant	Bak
147		Lorena	0	Mexican Restaurant	Restaurant	Peruvian Restaurant	Sushi Restaurant	Burger Jc
148		Loreto	0	Plaza	Cocktail Bar	Supermarket	Department Store	;
149		Los Alcázares	0	Fast Food Restaurant	Burger Joint	Café	Metro Station	Ho
150		Los Alpes	0	Pizza Place	Fast Food Restaurant	Sandwich Place	Burger Joint	C
151		Los Balsos No.1	0	Bakery	Pizza Place	Restaurant	Burger Joint	BBQ Jc
152		Los Balsos No.2	0	Café	Pizza Place	Hotel	Shopping Mall	Ice Cre Si
154		Los Colores	0	Ice Cream Shop	Grocery Store	Shopping Mall	Mexican Restaurant	Ho
155	Los Conquistadores		0	Café	Restaurant	Park	Fast Food Restaurant	Gym / Fitr Cer
157		Los Naranjos	0	Burger Joint	Clothing Store	Italian Restaurant	Shopping Mall	C
158		Los Pinos	0	Pizza Place	Restaurant	Gym	Park	Mexi Restaur
159		Los Ángeles	0	Sandwich Place	Pizza Place	Bar	Theater	Pl
160	López de Mesa		0	Wings Joint	Coffee Shop	Breakfast Spot	Zoo	Donut Si
161		Manila	0	Café	Hotel	Argentinian Restaurant	Restaurant	F
162	Manrique Central No.1		0	Department Store	Shopping Mall	Cemetery	Recreation Center	Gym / Fitr Cer
168		Miraflores	0	Supermarket	Shopping Mall	Bar	Pizza Place	Ice Cre Si
169		Miranda	0	Café	Theme Park	Metro Station	Multiplex	Li Ameri Restaur
170		Miravalle	0	Bar	Burger Joint	Café	Pizza Place	C

	barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comn Ven
172	Moravia	0	Donut Shop	Convenience Store	Sandwich Place	Plaza	Theme F
175	Nueva Villa de La Iguaná	0	Gym	Pizza Place	Bakery	Hotel	Seaf Restaur
176	Nueva Villa del Aburrá	0	Bar	Café	Pizza Place	Sandwich Place	The
184	Palermo	0	Plaza	Recreation Center	Fast Food Restaurant	Metro Station	Grocery St
185	Parque Juan Pablo II	0	Fast Food Restaurant	Food	Seafood Restaurant	BBQ Joint	Bus Sta1
186	Parque Norte	0	Café	Theme Park	Outdoor Event Space	Convenience Store	Botan Gar
187	Patio Bonito	0	Café	Hotel	Coffee Shop	Burger Joint	Restaur
188	Pedregal	0	Recreation Center	Gym	Business Service	Other Repair Shop	;
189	Perpetuo Socorro	0	Sandwich Place	Shopping Mall	Gym	Ice Cream Shop	Steakho
190	Picachito	0	Playground	Scenic Lookout	Athletics & Sports	Cosmetics Shop	Cowork Sp
192	Playón de Los Comuneros	0	IT Services	Coffee Shop	BBQ Joint	Donut Shop	Food & D SI
194	Prado	0	Shopping Mall	Sandwich Place	Restaurant	Café	Food Cc
197	Rosales	0	Burger Joint	Italian Restaurant	Gym	Gym / Fitness Center	Fast Fo Restaur
199	San Benito	0	Soccer Field	Art Museum	Café	Plaza	Bookst
200	San Bernardo	0	Fast Food Restaurant	Gym	Seafood Restaurant	BBQ Joint	Steakho
201	San Diego	0	Sandwich Place	Shopping Mall	Gym	Metro Station	L Ameri Restaur
202	San Germán	0	Gym / Fitness Center	Shopping Mall	Food & Drink Shop	Sandwich Place	Steakho
205	San Joaquín	0	Italian Restaurant	Hotel	Café	Sandwich Place	Restaur
208	San Lucas	0	Bakery	Shopping Mall	Deli / Bodega	Restaurant	Snack Pl
210	San Miguel	0	Plaza	Pizza Place	Theater	Park	Caribb Restaur

	barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comn Ven
212	San Pedro	0	Café	Shopping Mall	BBQ Joint	Plaza	Metro Sta1
214	Santa Fé	0	BBQ Joint	Bakery	Cosmetics Shop	Pub	Shoe St
216	Santa Lucía	0	Cable Car	Burger Joint	Soccer Field	Metro Station	Restaur
218	Santa María de Los Ángeles	0	Hotel	Latin American Restaurant	Shopping Mall	Bakery	Mediterran Restaur
219	Santa Mónica	0	BBQ Joint	Pizza Place	Ice Cream Shop	Museum	Fast Fo Restaur
220	Santa Rosa de Lima	0	Pharmacy	Coffee Shop	Shopping Mall	Zoo	Donut SI
221	Santa Teresita	0	BBQ Joint	Pizza Place	Fast Food Restaurant	Pharmacy	Food Tr
224	Santo Domingo Savio No.2	0	Liquor Store	South American Restaurant	Plaza	Bar	Caribb Restaur
225	Sevilla	0	Café	Theme Park	Latin American Restaurant	Bar	Cemei
226	Simón Bolívar	0	Restaurant	Pizza Place	Bakery	Gym	Burger Jo
227	Sucre	0	Caribbean Restaurant	Tram Station	Steakhouse	Boutique	Athletic Sp
228	Suramericana	0	BBQ Joint	Sandwich Place	Hotel	Pizza Place	Restaur
230	Tenche	0	Pet Store	Bakery	Historic Site	Auto Dealership	Metro Sta1
231	Toscana	0	Construction & Landscaping	Metro Station	Grocery Store	Gym	Recreat Cer
233	Tricentenario	0	Tennis Court	Metro Station	Farm	Recreation Center	Grocery St
234	Trinidad	0	BBQ Joint	Zoo	Pet Service	Pizza Place	Recreat Cer
235	U.D. Atanasio Girardot	0	Gym	Hotel	Athletics & Sports	Sandwich Place	Bak
236	Universidad Nacional	0	Pizza Place	Housing Development	Cocktail Bar	Bar	Bookst
237	Universidad de Antioquia	0	Café	Theme Park	Park	Metro Station	Botan Gar

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comn Ven
239	Versalles No.1		0	Sandwich Place	Bar	Plaza	Pizza Place	H
241	Villa Carlota		0	Gym	BBQ Joint	Hotel	Italian Restaurant	Supermai
246	Villa Niza		0	Metro Station	Recreation Center	Farm	Cable Car	Grocery St
247	Villa Nueva		0	Sandwich Place	BBQ Joint	Bar	Italian Restaurant	Art Muse



## Agrupacion 2

```
In [35]: Mde_group2=Medellin_merged.loc[Medellin_merged['ClusterLabels'] == 1, Medellin_merge  
Mde_group2
```

Out[35]:

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th M Comr Ver
6	Andalucía		1	Cable Car	Metro Station	Zoo	Food & Drink Shop	Food	Fisl Cl St
96	Granizal		1	Cable Car	South American Restaurant	Plaza	Rental Service	Fish & Chips Shop	Fast Fo Restaur
99	Héctor Abad Gómez		1	Cable Car	Metro Station	Clothing Store	Park	Zoo	Fc
102	Juan Pablo II		1	BBQ Joint	Cable Car	Zoo	Electronics Store	Food & Drink Shop	Fc
108	La Avanzada		1	South American Restaurant	Cable Car	Plaza	Liquor Store	Food	Fisl Cl St
114	La Esperanza No.2		1	South American Restaurant	Cable Car	Plaza	Construction & Landscaping	History Museum	Disco St
117	La Francia		1	Cable Car	Metro Station	Zoo	Food & Drink Shop	Food	Fisl Cl St
118	La Frontera		1	Cable Car	Coffee Shop	Metro Station	BBQ Joint	Zoo	Food Di St
121	La Isla		1	Cable Car	Fast Food Restaurant	Metro Station	Furniture / Home Store	Zoo	Fc

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th M Comr Ver
133	La Sierra		1	BBQ Joint	Campground	Cable Car	Zoo	Electronics Store	Food Di St
137	Las Estancias		1	Hardware Store	Tram Station	Shoe Store	Cable Car	Zoo	Do Restaur
146	Llanaditas		1	Cable Car	Home Service	Shopping Mall	Scenic Lookout	Zoo	Fisl Cl St
156	Los Mangos		1	Construction & Landscaping	Home Service	Nursery School	Cable Car	Donut Shop	Fc
173	Moscú No.1		1	Cable Car	Fast Food Restaurant	Park	Zoo	Food	Fisl Cl St
178	Ocho de Marzo		1	BBQ Joint	Cable Car	Zoo	Electronics Store	Food & Drink Shop	Fc
179	Olaya Herrera		1	Pharmacy	Burger Joint	Cable Car	Zoo	Donut Shop	Fc
181	Pablo VI		1	Cable Car	Metro Station	Clothing Store	Furniture / Home Store	Zoo	Fc
193	Popular		1	Cable Car	Metro Station	Furniture / Home Store	Other Repair Shop	Zoo	Fc
213	Santa Cruz		1	Metro Station	Fast Food Restaurant	Farm	Grocery Store	Cable Car	z
217	Santa Margarita		1	Cable Car	Arepas Restaurant	Zoo	Donut Shop	Food & Drink Shop	Fc
223	Santo Domingo Savio No.1		1	South American Restaurant	Cable Car	Plaza	Liquor Store	Food	Fisl Cl St
232	Trece de Noviembre		1	Cable Car	Park	Scenic Lookout	Zoo	Food	Fisl Cl St
248	Villa Turbay		1	Cable Car	Zoo	Food Service	Food & Drink Shop	Food	Fisl Cl St
249	Villa del Socorro		1	Cable Car	Fast Food Restaurant	Bakery	Zoo	Electronics Store	Food Di St

**Agrupacion 3**

In [36]: Mde\_group3=Medellin\_merged.loc[Medellin\_merged['ClusterLabels'] == 2, Medellin\_merge  
Mde\_group3]

Out[36]:

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th M Com Ven
24		Belencito	2	Ice Cream Shop	General Entertainment	Art Gallery	Café	Museum	Fast Food Restaurant
29		Betania	2	Ice Cream Shop	Café	Museum	Coffee Shop	Art Gallery	Scenic Lookout
67		El Corazón	2	Ice Cream Shop	Café	Coffee Shop	Art Gallery	Scenic Lookout	;
76		El Raizal	2	Diner	Ice Cream Shop	Park	Scenic Lookout	Doner Restaurant	Fish CI S
82		El Triunfo	2	Mountain	Scenic Lookout	Donut Shop	Food & Drink Shop	Food	Fis CI S
112		La Cruz	2	Food Truck	Ice Cream Shop	Pedestrian Plaza	Zoo	Donut Shop	Fi
139	Las Independencias		2	Ice Cream Shop	Café	Coffee Shop	Art Gallery	Scenic Lookout	;
177	Nuevos Conquistadores		2	Ice Cream Shop	Café	Coffee Shop	Art Gallery	Scenic Lookout	;
229	Tejelo		2	Ice Cream Shop	Burger Joint	Bar	Zoo	Electronics Store	Foo D S
238	Veinte de Julio		2	Ice Cream Shop	Park	Burger Joint	Street Art	Scenic Lookout	Art Gal
240	Versalles No.2		2	Ice Cream Shop	Scenic Lookout	Other Great Outdoors	Zoo	Doner Restaurant	Fis CI S



#### Agrupacion 4

In [37]: Mde\_group4=Medellin\_merged.loc[Medellin\_merged['ClusterLabels'] == 3, Medellin\_merge  
Mde\_group4]

Out[37]:

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6 C
20		Barrios de Jesús	3	Tram Station	Soccer Field	Hardware Store	Shoe Store	Salon / Barbershop	Re

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6 C
33	Bomboná No.2		3	Tram Station	Pizza Place	Soccer Field	Doner Restaurant	Food	
60	Doce de Octubre No.1		3	Soccer Field	Mountain	Playground	Recreation Center	Scenic Lookout	I
61	Doce de Octubre No.2		3	Soccer Field	Recreation Center	Scenic Lookout	Laundromat	Zoo	
80	El Socorro		3	Cable Car	General Entertainment	Street Art	Burger Joint	Soccer Field	Re
103	Juan XXIII La Quiebra		3	Cable Car	Soccer Field	Ski Trail	Zoo	Fish & Chips Shop	F Re
104	Kennedy		3	Soccer Field	Wings Joint	Zoo	Doner Restaurant	Food	
123	La Libertad		3	Soccer Field	Multiplex	Shopping Mall	Tram Station	Gym / Fitness Center	Re
130	La Pradera		3	Cable Car	Soccer Field	Street Art	Burger Joint	Food Court	
153	Los Cerros El Vergel		3	Tram Station	Athletics & Sports	Ice Cream Shop	Shopping Mall	Soccer Field	
166	Metropolitano		3	Soccer Field	Cable Car	Shopping Mall	Zoo	Fish & Chips Shop	F Re
167	Mirador del Doce		3	Mountain	Soccer Field	Playground	Recreation Center	Scenic Lookout	I
180	Oriente		3	Soccer Field	Betting Shop	Park	Zoo	Donut Shop	
195	Progreso No.2		3	Mountain	Playground	Soccer Field	Scenic Lookout	Doner Restaurant	
198	San Antonio		3	Tram Station	Soccer Field	Women's Store	Discount Store	Food	
203	San Javier No.1		3	Soccer Field	General Entertainment	Street Art	Park	Burger Joint	
204	San Javier No.2		3	Soccer Field	Street Art	Burger Joint	General Entertainment	Food & Drink Shop	
209	San Martín de Porres		3	Soccer Field	Laundromat	Zoo	Donut Shop	Food	

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Com V
215	Santa Inés		3	Soccer Field	Ice Cream Shop	Antique Shop	Diner	Locksmith	Electronics
222	Santander		3	Soccer Field	Recreation Center	Zoo	Doner Restaurant	Food	
250	Villatina		3	Tram Station	Soccer Field	Women's Store	Discount Store	Food	

## Agrupacion 5

```
In [38]: Mde_group5=Medellin_merged.loc[Medellin_merged['ClusterLabels'] == 4, Medellin_merge
Mde_group5
```

Out[38]:

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Com V
0	Aldea Pablo VI		4	South American Restaurant	Cable Car	Plaza	Park	Rental Service	Furniture
22	Batallón Girardot		4	Park	Comfort Food Restaurant	Other Great Outdoors	Zoo	Donut Shop	
27	Berlín		4	Fast Food Restaurant	Plaza	Café	Recreation Center	Park	
36	Boyacá		4	Ice Cream Shop	Burger Joint	Park	Bar	Zoo	Electronics
66	El Compromiso		4	South American Restaurant	Cable Car	Plaza	Park	Rental Service	Furniture
71	El Pesebre		4	Gym / Fitness Center	Shopping Mall	Sandwich Place	Juice Bar	Park	Chocolates
74	El Pomar		4	Shopping Mall	History Museum	Plaza	Department Store	Gym / Fitness Center	Laptops
79	El Salvador		4	Department Store	Park	Restaurant	Art Gallery	Supermarket	Newspapers
84	Enciso		4	Plaza	Park	Caribbean Restaurant	Steakhouse	Museum	Street
119	La Gloria		4	Park	Pizza Place	Ice Cream Shop	Shopping Mall	Burger Joint	Meat

		barrio	ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Com V
122		La Ladera		4 Comfort Food Restaurant	Clothing Store	Park	Construction & Landscaping	Zoo	C
125		La Mansión		4 Comfort Food Restaurant	Park	Sandwich Place	Theater	Cosmetics Shop	Cowork
132		La Salle		4 Park	Café	Bus Station	Business Service	Zoo	
138		Las Granjas		4 Park	Bus Station	Locksmith	Business Service	Zoo	Electronics
144		Las Violetas		4 Theater	Fast Food Restaurant	Park	Sandwich Place	Café	Disco
163		Manrique Central No.2		4 Park	Shopping Mall	History Museum	Department Store	Plaza	Cultural
164		Manrique Oriental		4 Park	Comfort Food Restaurant	Shopping Mall	Gym / Fitness Center	Department Store	Food Resta
165		María Cano-Caramolas		4 Rental Service	Park	French Restaurant	Grocery Store	Restaurant	Eye Doctor
174		Moscú No.2		4 Cable Car	South American Restaurant	Park	Rental Service	Medical Supply Store	Business Services
183		Palenque		4 Gym / Fitness Center	Motel	Big Box Store	Fried Chicken Joint	Park	C
196		Robledo		4 Gym / Fitness Center	Big Box Store	Fried Chicken Joint	Shopping Mall	Park	
206		San José La Cima No.1		4 Rental Service	Park	French Restaurant	Grocery Store	Restaurant	Eye Doctor
207		San José La Cima No.2		4 Soccer Field	Grocery Store	Park	Antique Shop	Rental Service	Eye Doctor
211		San Pablo		4 Park	Cable Car	Plaza	Zoo	Food	Finance
242		Villa Flora		4 Gym / Fitness Center	Big Box Store	Fried Chicken Joint	Park	Zoo	C
243		Villa Guadalupe		4 Café	Park	Fast Food Restaurant	Food & Drink Shop	Creperie	Cultural Resta
244		Villa Hermosa		4 Park	Comfort Food Restaurant	Clothing Store	Zoo	Doner Restaurant	
245		Villa Lilliam		4 Tram Station	Park	Women's Store	Cable Car	Shoe Store	C

## 6. Conclusiones

En base a los resultados obtenidos, Podemos notar que el grupo #5 'Mde\_group5' que pertenece al **Cluster 4**, tiene una afinidad con el sitio que estamos buscando, porque tiene sitios de alto flujo de transeuntes, como estaciones de metro, parques, escenarios deportivos, gimnasios entre otros, y aunque hay sitios de comida, esto indica que hay una demanda de consumo, de sitios que ofrecen ofertas gastronomicas, observamos que no hay disponibles en este grupo **pizzerias**, asi que seria factible abrir una alli.

Sin embargo habria que analizar a profundidad otros aspectos, para determinar de los barrios del **Cluster 4**, cual es el mas factible, para abrir la pizzeria, estos aspectos pueden ser de criminalidad, rango de precios de los sitios de comida, y cercania con sitios turisticos.

**Gracias!!**