

The Battle of the Neighborhoods

How to improve Neighborhood security & life quality

1. Introduction & Business Problem

Today architects, urban planners and public administrators are faced with the need to redesign large cities to guarantee citizens, in continuous increase and often with a progressive concentration in a few neighborhoods, greater safety and quality of life. The large investments in "smart cities" that are being made are addressed in this sense. Unfortunately one of the most serious problems that many large cities are facing is that of widespread crime especially in some neighborhoods: a lot of work has been done in recent years (think of the redevelopment of the Bronx neighborhood in New York) but much remains to be done.

Our goal is to provide an analytical tool to study a possible correlation between crime and neighborhood characteristics so that targeted redevelopment interventions can be carried out by optimizing the available resources.

2. Target Audience

Public administration with particular reference to urban planners, mayors and all those who are dealing with the modernization of cities and whose are involved in "smart cities" projects.

3. Data

One city will be analysed in this project : San Francisco.

We'll be using the following datasets for analyzing this case.

Data 1 : San Francisco Crime Dataset available at URL
https://cocl.us/sanfran_crime_dataset

	IncidentNum	Category	Descript	DayOfWeek	Date	Time	Neighborhood	Resolution	Address	X	Y	Location
0	120058272	WEAPON LAWS	POSS OF PROHIBITED WEAPON	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.403405	37.775421	(37.775420706711, -122.403404791479)
1	120058272	WEAPON LAWS	FIREARM, LOADED, IN VEHICLE, POSSESSION OR USE	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.403405	37.775421	(37.775420706711, -122.403404791479)
2	141059263	WARRANTS	WARRANT ARREST	Monday	04/25/2016 12:00:00 AM	14:59	BAYVIEW	ARREST, BOOKED	KEITH ST / SHAFTER AV	-122.388856	37.729981	(37.7299809672996, -122.388856204292)
3	160013662	NON-CRIMINAL	LOST PROPERTY	Tuesday	01/05/2016 12:00:00 AM	23:50	TENDERLOIN	NONE	JONES ST / OFARRELL ST	-122.412971	37.785788	(37.7857883766888, -122.412970537591)
4	160002740	NON-CRIMINAL	LOST PROPERTY	Friday	01/01/2016 12:00:00 AM	00:30	MISSION	NONE	16TH ST / MISSION ST	-122.419672	37.765050	(37.7650501214668, -122.419671780296)
5	160002869	ASSAULT	BATTERY	Friday	01/01/2016 12:00:00 AM	21:35	NORTHERN	NONE	1700 Block of BUSH ST	-122.426077	37.788019	(37.788018555829, -122.426077177375)

Data 2 : San Francisco Neighborhood

We'll scrape the following page containing San Francisco zipcode, <http://www.healthysf.org/bdi/outcomes/zipmap.htm>.

Zip Code	Neighborhood	Latitude	Longitude
1 94102	Hayes Valley/Tenderloin/North of Market	37.780	-122.420
2 94103	South of Market	37.780	-122.410
3 94107	Potrero Hill	37.770	-122.390
4 94108	Chinatown	37.791	-122.409
5 94109	Polk/Russian Hill (Nob Hill)	37.790	-122.420
6 94110	Inner Mission/Bernal Heights	37.750	-122.420
7 94112	Ingelside-Excelsior/Crocker-Amazon	37.720	-122.440
8 94114	Castro/Noe Valley	37.760	-122.440
9 94115	Western Addition/Japantown	37.790	-122.440
10 94116	Parkside/Forest Hill	37.740	-122.480
11 94117	Haight-Ashbury	37.770	-122.440
12 94118	Inner Richmond	37.780	-122.460
13 94121	Outer Richmond	37.800	-122.700
14 94122	Sunset	37.760	-122.480
15 94123	Marina	37.800	-122.440
16 94124	Bayview-Hunters Point	37.730	-122.380
17 94127	St. Francis Wood/Miraloma/West Portal	37.730	-122.460
18 94131	Twin Peaks-Glen Park	37.750	-122.440
19 94132	Lake Merced	37.720	-122.480
20 94133	North Beach/Chinatown	37.800	-122.440
21 94134	Visitacion Valley/Sunnydale	37.720	-122.410

Neighborhood geographical coordinates provided by previous dataset will be utilized as input for the Foursquare API, that will be leveraged to provision venues information for each neighborhood. We'll use the Foursquare API to explore neighborhoods in San Francisco.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Hayes Valley/Tenderloin/North of Market	37.78	-122.42	Herbst Theater	37.779548	-122.420953	Concert Hall
1	Hayes Valley/Tenderloin/North of Market	37.78	-122.42	War Memorial Opera House	37.778601	-122.420816	Opera House
2	Hayes Valley/Tenderloin/North of Market	37.78	-122.42	San Francisco Ballet	37.778580	-122.420798	Dance Studio
3	Hayes Valley/Tenderloin/North of Market	37.78	-122.42	Louise M. Davies Symphony Hall	37.777976	-122.420157	Concert Hall
4	Hayes Valley/Tenderloin/North of Market	37.78	-122.42	War Memorial Court	37.779042	-122.420971	Park

...

...

Fig. 1 - Top 100 venues that are in each neighborhood within a radius of 500 meters

Next step will be clustering Neighborhoods based on previous venues information. So we'll study correlation between clusters and crime dataset.