San Francisco Homeless Crisis
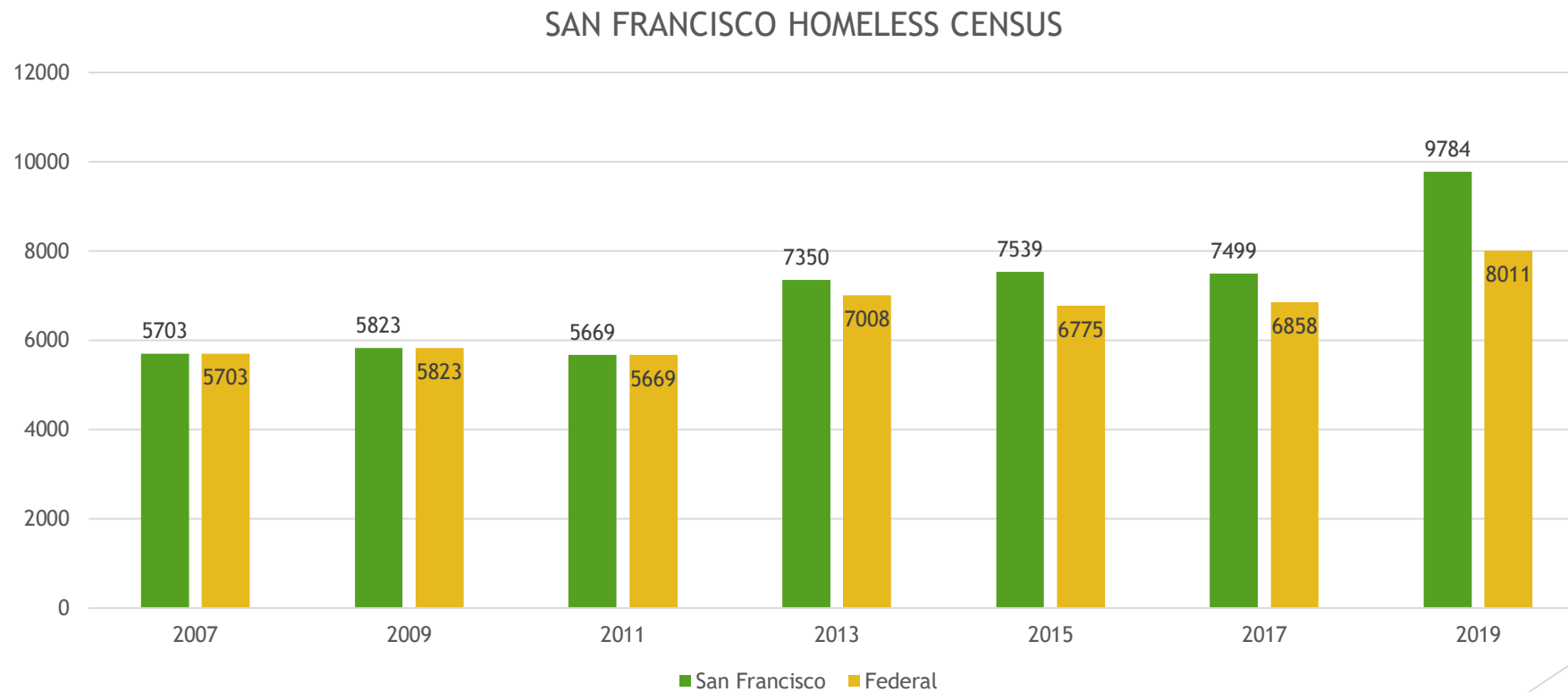
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~ Introduction ~

- Ever-evolving technology have continued to capture our surprise in new creative ideas and services.

- Software companies such as Google, Facebook, Uber, Twitter, and Instagram spurred from the San Francisco Bay Area, Silicon Valley have brought a great number of people from all over the world to Northern California.

- Software developers and engineers have gathered to create and innovate in the Silicon Valley.

- On the flip side, there has been a clearly visible income gap amongst the people living in San Francisco.

The housing has increased however many average workers in San Francisco's income has not been raised.

San Francisco Rent Trends
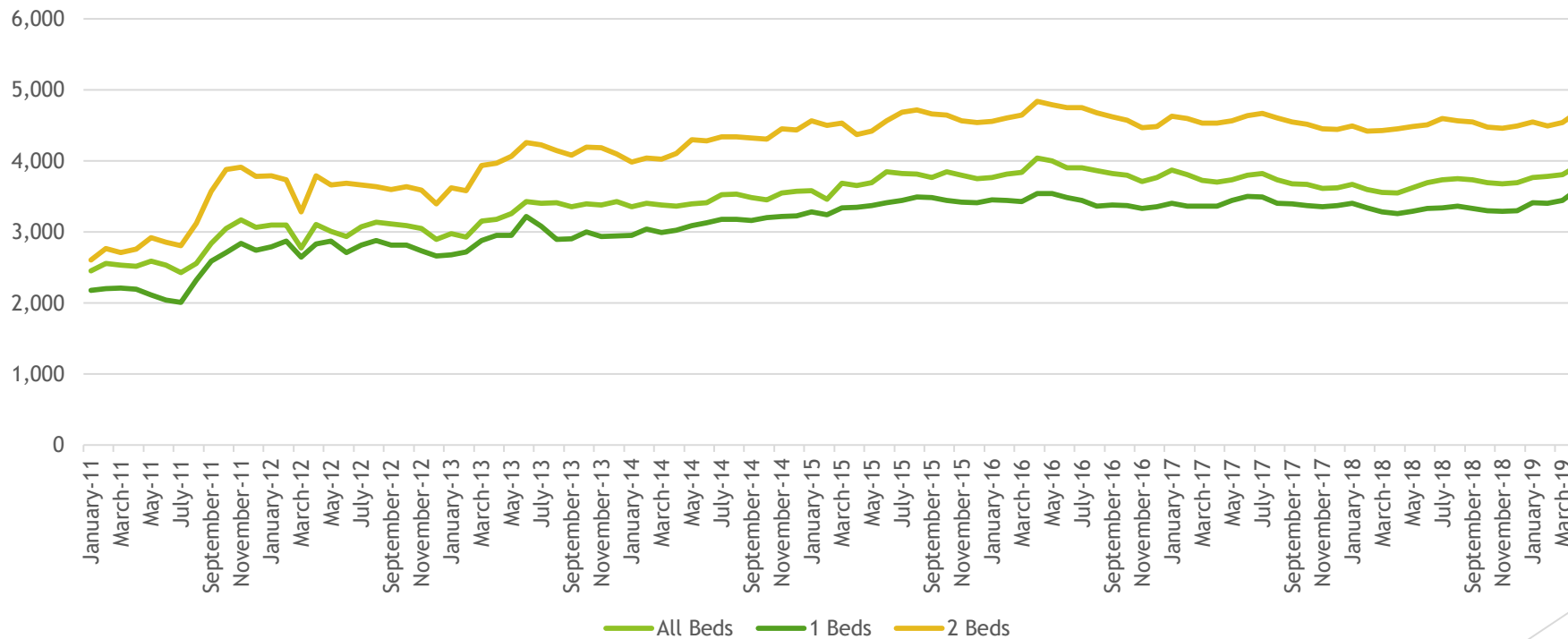
Just the Federal count in homeless has doubled from ten years ago. There are almost ten thousand homeless people on the street in San Francisco

SAN FRANCISCO HOMELESS CENSUS

Year	San Francisco	Federal
2007	5703	5703
2009	5823	5823
2011	5669	5669
2013	7350	7008
2015	7539	6775
2017	7499	6858
2019	9784	8011

■ San Francisco ■ Federal

Methodology

- There are several limitations that we would need to consider in order to solve the homelessness in San Francisco.
    - High housing cost to house the homeless individual and families.
    - Restriction on building new affordable housing in San Francisco
    - Difficulties renovating the current building for housing
    - Overcrowded homeless shelters

In essence, the private property that is vacant at night and located all around the city are the 160 churches in San Francisco.

- If every church housed 20 homeless', in just one day, half of all homeless in San Francisco will be cut in half. The effect would not only eliminate the homeless crisis but would open up homeless shelters for people in need. People would then find occupancy and the increasing homelessness would decrease in time. Churches would be rewarded through additional tax exemption and would be able to bring more people to their service. It would be a win-win deal for all people in San Francisco.

Analysis

► **In order to bring upon such mandate, there would be a need for a plan and a proof of concept to show that the proposition is valid and effective.**

► **In order to maximize the efficiency of housing, we cannot just allocate a static number of people in every church, however, there is no data set for the specific number each church can hold.**

► So we would need to maximize the efficiency in housing homelessness in terms of proximity of each church.

► The closer the churches would be able to expand the housing cap, so if there is occupancy in another church nearby we would quickly be able to allocate people between each church.

Data

- The proof of concept that would be proposed would first target the churches that are 800m within a radius of City Hall.

- Through the FourSquare database, we would be filtering the churches around City Hall that are 800m in radius and measuring the proximity of each church to each other. We will then rank and group in terms of distance of proximity.

- Then we would be able to accurately measure how effective this proposition can be, with just an 800m radius.

Results and Discussion

▶ As a first step, access to Foursquare API to retrieve the information for churches around the San Francisco City Hall is initiated. The address for the San Francisco City Hall would be 1 Dr. Carlton B Goodlett Pl, San Francisco, CA 94102.
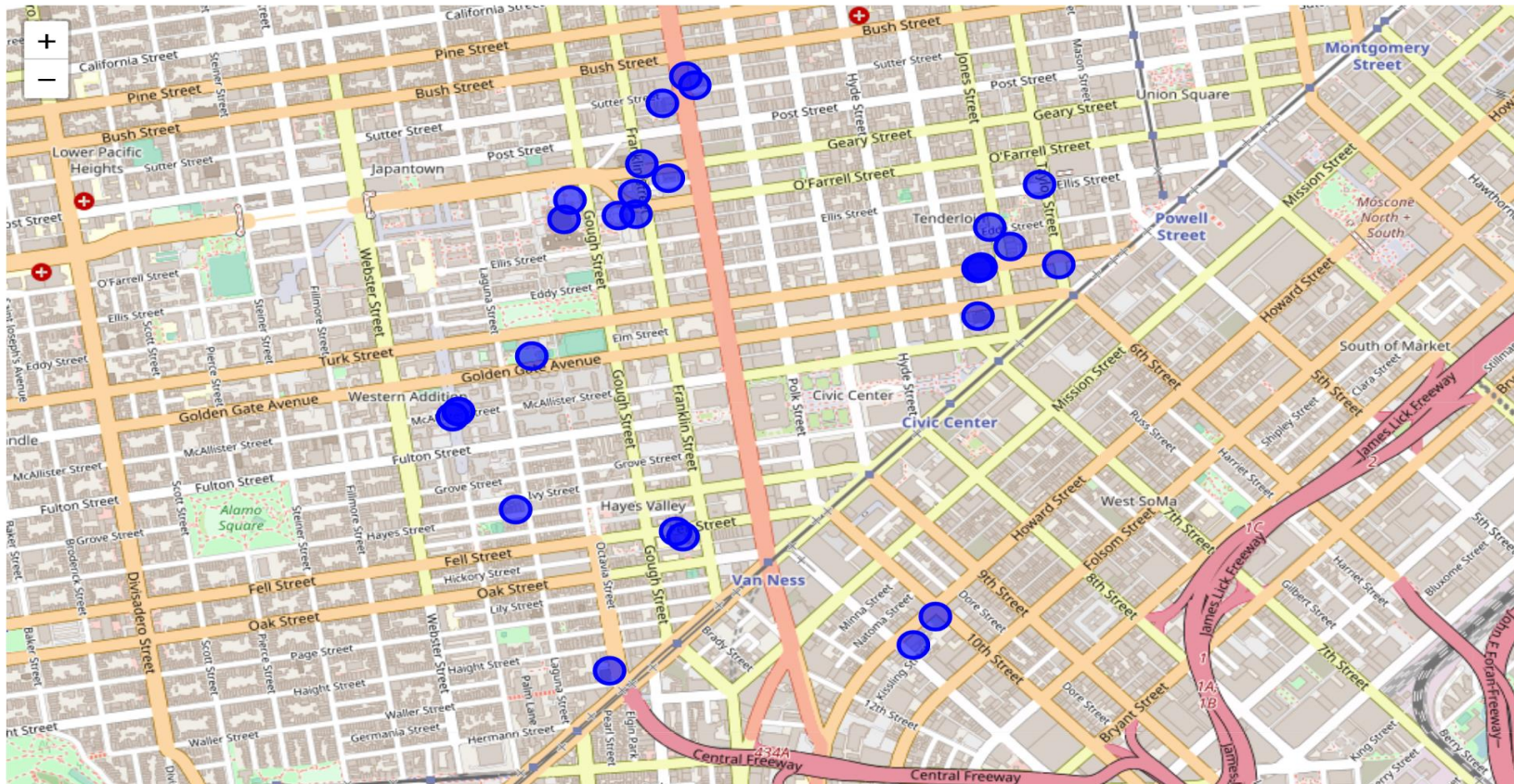
Proximity Chart

- The next step would be to calculate the proximity between every church of 800m of the City Hall. We would be creating a new data frame to store proximity data to list the distance between two churches.

- Then we would use the proximity data to create a data frame including the name of the church, location data, and the expected occupancy of each church.

|	name	lat	lng	occupancy
0	Church of the Advent of Christ the King	37.775867	-122.421762	30
1	Church Of The Nativity Of Our Lord	37.776017	-122.421992	30
2	Bethel A.M.E. Church	37.780607	-122.426202	20
3	St Boniface Roman Catholic Church	37.781685	-122.413158	20
4	St. Joseph's Roman Catholic Church	37.773783	-122.414402	25
5	Hillsong SF	37.787731	-122.421429	30
6	Hamilton Square Baptist Church	37.785688	-122.422971	25
7	SF City Impact	37.783495	-122.412220	25
8	Neighborhood Baptist Church	37.776578	-122.426658	20
9	Saint Paulus Luthern Church	37.779159	-122.428324	30
10	Temple Calvario	37.772928	-122.415923	25

Proximity Map Plot
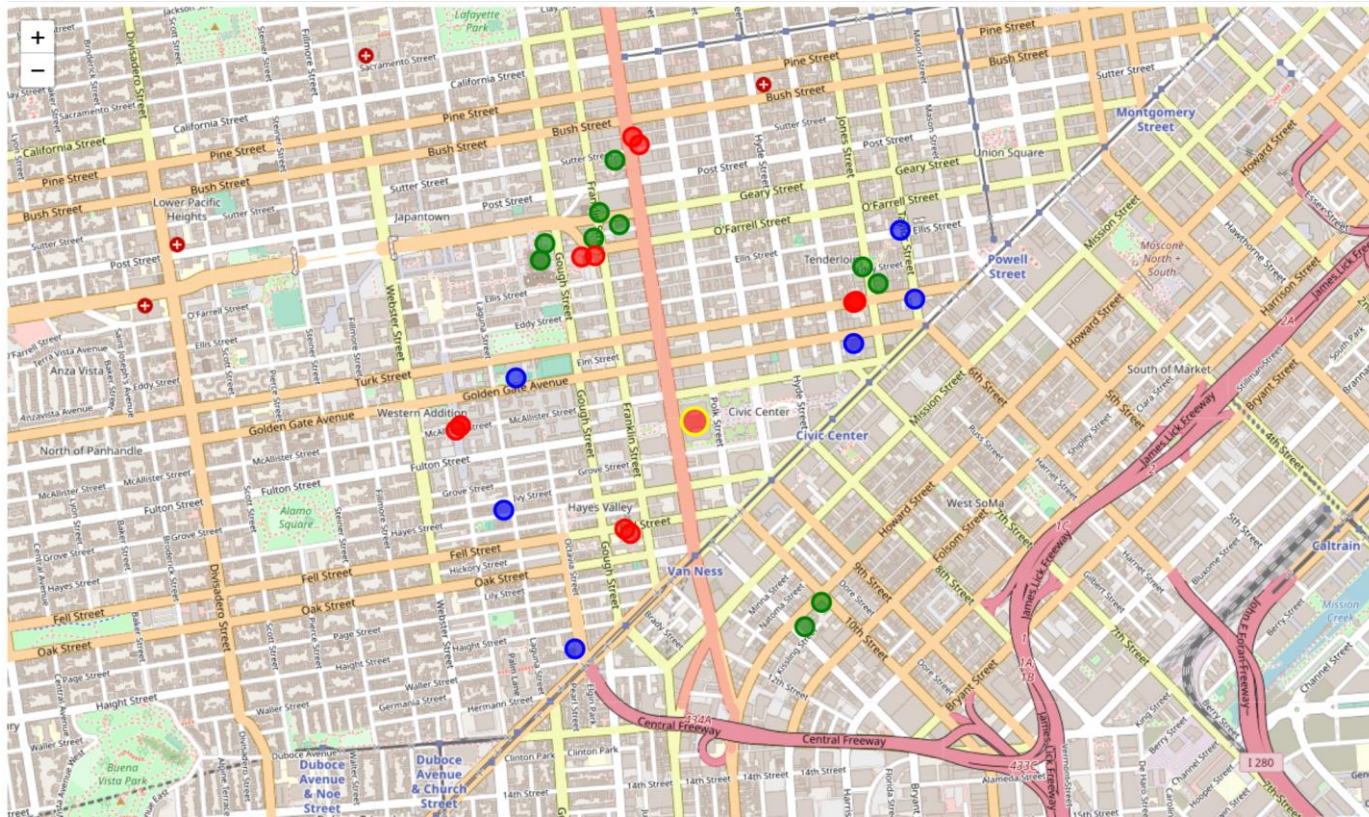
K-mean Initialization
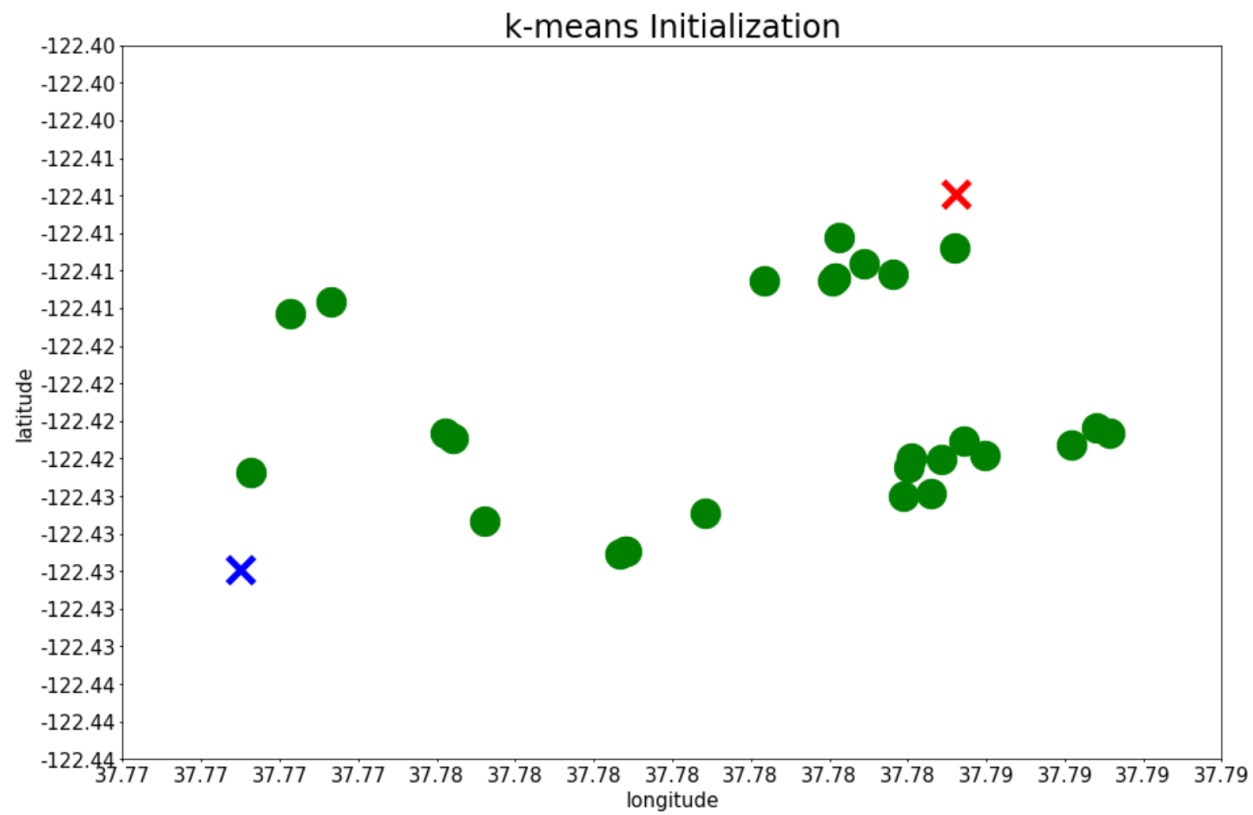
We would be running four iterations of the k-means clustering as shown below.
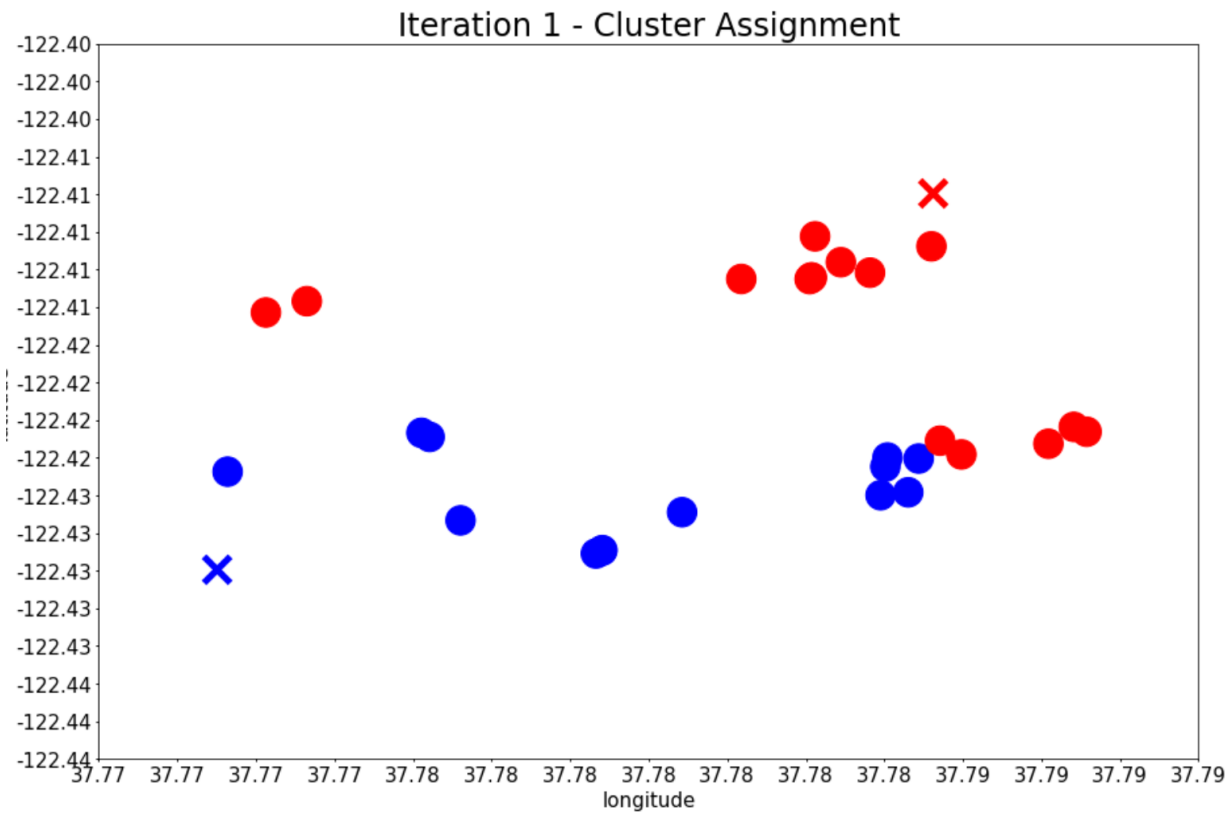
In the final step, we would be using the k-mean initialization to allocate homeless' within the region efficiently. We would be separating into 2 groups to allocate within the 800m radius using the two centroids visualized below.
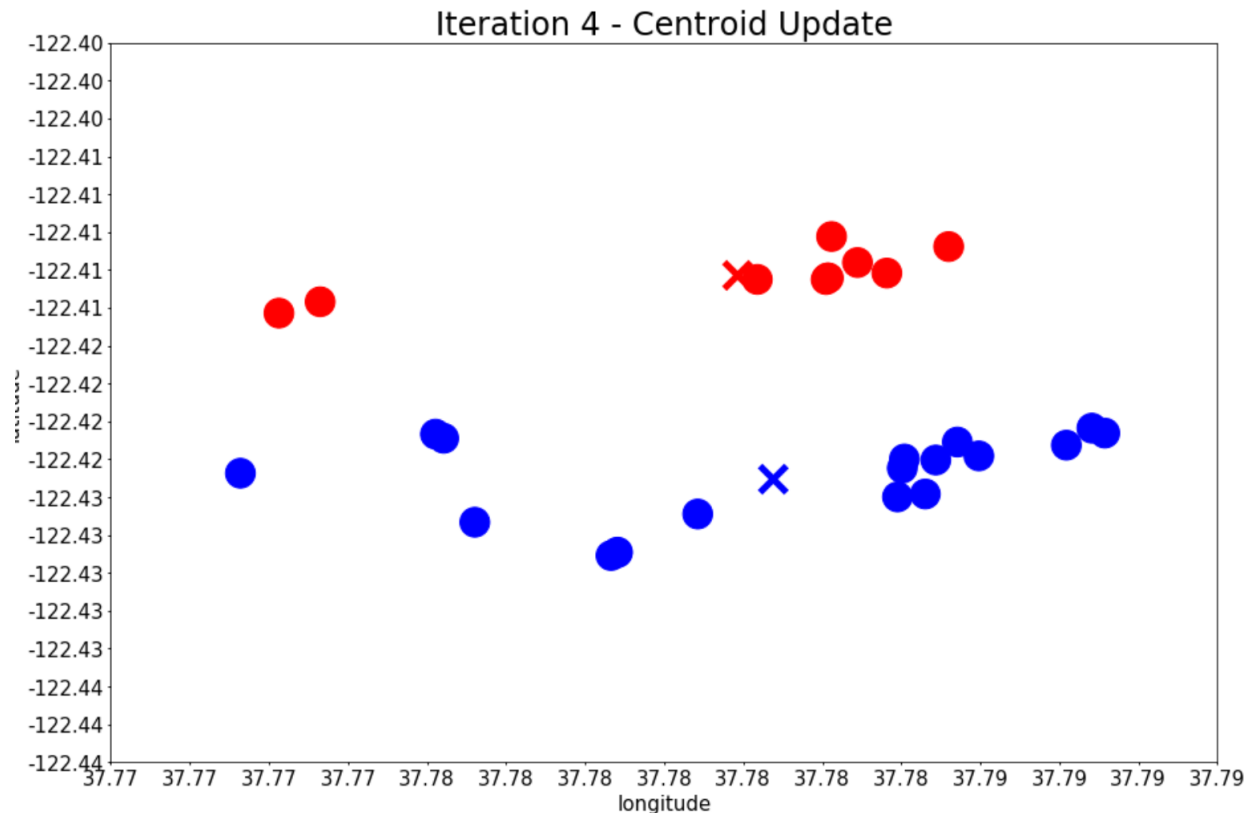
Conclusion

▶ Through the smart allocation of homeless between churches, we would be able to achieve up to 23% efficiency in housing homeless' in an 800m radius of the San Francisco City Hall.

▶ This new plan would achieve up to 730 homeless housing in the city instead of 560 homeless' and the effects would clearly be effective in fighting homelessness in San Francisco.

▶ If we would be able to roll out this throughout the San Francisco City, we can expect a minimum of 3200 to up to 4300 homeless housing in a single day. This would allow bringing the rate of homeless' on the street to half and at a level that was ten years ago.

▶ The homeless shelter and housing would start having a vacancy and more homeless would have a chance to find a stable income. This new plan would accelerate in a decrease of homelessness in San Francisco exponentially.
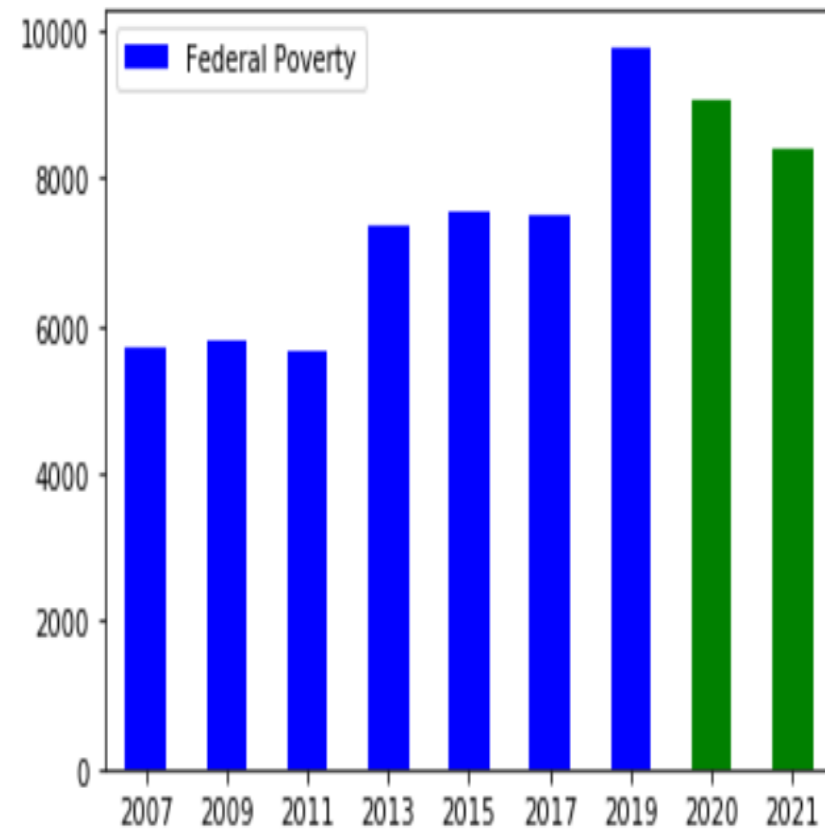
Source

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