

# CS 591 L1 Project: Hospitals, Crimes, and Location

## Introduction

This project aims to help solve the problem of the placement of hospitals in the Boston area. Using the popular k-means algorithm and my own algorithm for hospital load calculations, I was able to derive possible solutions to this problem. I used a crime dataset from the City of Boston Data Portal and a dataset of hospitals in the Boston area.

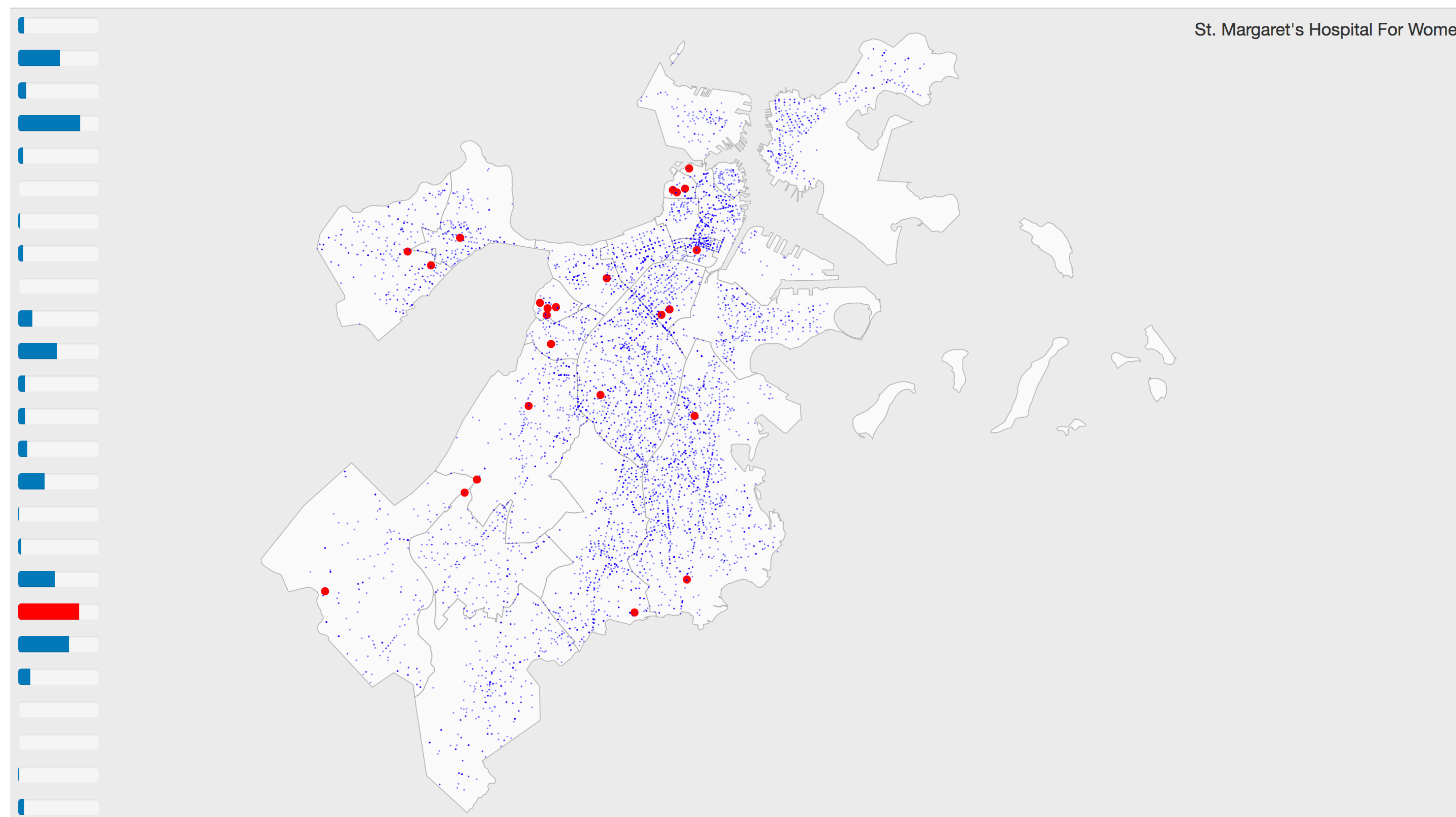
## K-Means Technique

Using the crime data from the City of Boston, I ran the K-means algorithm. This algorithm calculates a parameterized number of means for a dataset of  $(x, y)$  points. This set of means tries to get the optimal setup for minimized distance from each point to its respective mean. In this scenario, you can translate the means as being where hospitals should be if you wanted to place them based off crime locations.

## Pros and Cons

There are many interesting facets of this project. One thing that I was thinking about while implementing these tools was the fact that you cannot base the location of hospitals just off of crime data singularly. While it should be a factor, there are many other factors that come into play, such as population density.

However, this visualization and tool could help take into account the one factor of crime. Combined with a visualization for population density, it could become a very powerful and useful tool.



## Preview of the Visualization

This is a preview of one of the data visualizations that I am implementing. The underlying layer of the visualization is a map of the city of Boston and then I have added circles that represent the crimes (blue) and the hospitals (red). The bars on the left side of the visualization represent the “load” of the hospitals. Using the square footage of the hospitals, I was able to calculate the amount of patients it can hold at once. Assuming 1 patient per crime, I assigned each crime to the closest hospital. I then calculated the load of each hospital. If you click on a hospital, it’s corresponding bar lights up and the name is shown in the top right.