# Measuring Child-Friendliness in Boston Neighborhoods by Ji Eun Yang and Robin Liu

## Introduction:

While Boston's overall population increased by 4.8% (from 2000 to 2010), ***the number of household families with children dramatically fell by 11%, now standing at 16.8%***. As we can see in the graph below (Figure 1), the population of residents under the age of eighteen has steadily decreased over the past couple of decades. Although Boston is great at catering to young professionals, it lacks the needs that families with children need. Therefore, we developed a method to calculate child friendliness in Boston neighborhoods. These calculations can highlight areas that do better, and especially areas that can do much better.

Population of Boston Residents Ages <18 (1950-2013)

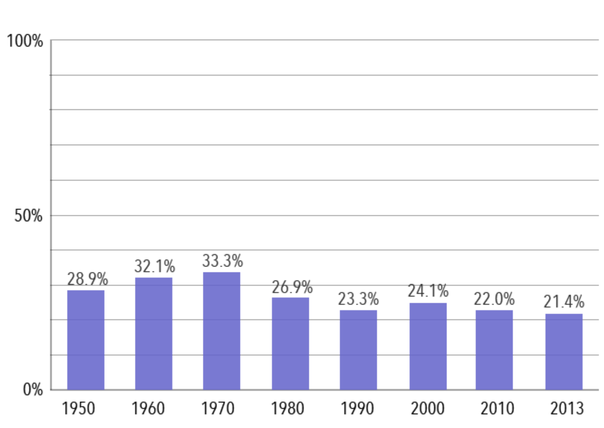



Figure 1

Source: http://www.bostonplans.org/

## Method:

We accumulated various metrics on certain characteristics of all neighborhoods in Boston. The four characteristics, that we took into consideration are: **education, safety, health, and living cost**. We took data sets from the City of Boston portal related to each of these characteristics to develop an optimization problem and a scoring algorithm.

## Algorithm:

We implemented two algorithms: an *optimization algorithm and a scoring algorithm*. For our optimization algorithm, we needed to find the closest distance hospital from each neighborhood.

### Optimization Algorithm:

For each (lat,lng) point of a neighborhood, we calculated the distance (km) distance to each hospital, and found the minimum.

### Scoring Algorithm:

For each neighborhood we calculated a score:

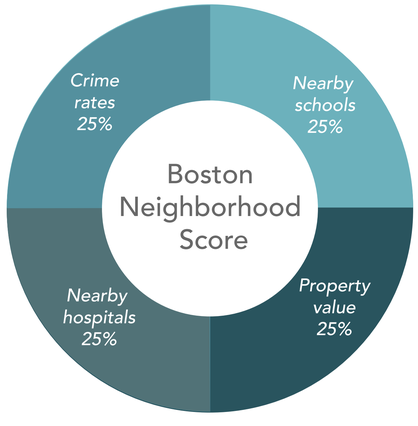
Score = min_hospital_distance * 0.25

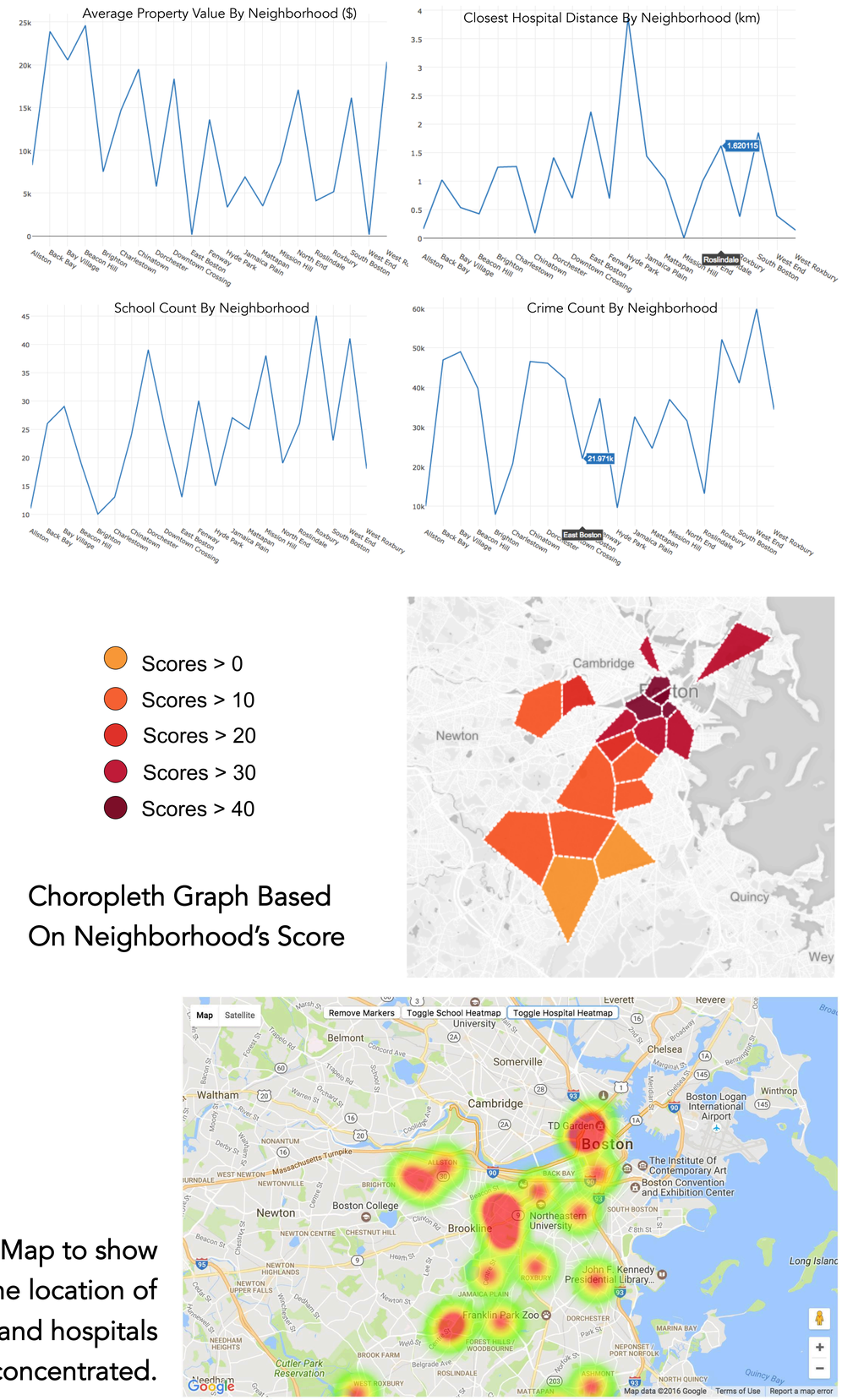
Score += school_count * 0.25

Score -= avg_property_value * 0.25

Score -= crime_count * 0.25.

Each value in the score was weighted to be worth 25% of the score.







Choropleth Graph Based On Neighborhood's Score




Heat Map to show Where the location of Schools and hospitals Are concentrated.