Pi Beta Theta - Kevin Bernat, Sheena Chu, and Estelle Ostro
January 26, 2016
CS 122 - Project Proposal

Each group must submit a one or two page proposal that describes the goal of the project and the source of data the group will use. It should also give a basic sketch of the work required to complete the project and a timeline for completing it. The proposal should also include a description of how the group plans to fulfill the third condition listed below.

1. *have a clear goal*
2. *use an interesting source of data*
3. *use at least one interesting new data structure, algorithm, or programming technology per person (for example, using SWIG with python).*

The goal of our project is to determine how environmentally friendly Chicago neighborhoods are based on their energy usage (electricity and natural gas), renewable energy sources, proximity to farmer's markets, access to recycling bin routes, etc. A rating will be given to neighborhoods based on how well they perform. After assessing all of these factors, we will provide suggestions that families and businesses can use in order to decrease their energy consumption in their neighborhood. This will include information regarding how much money and energy (electricity, natural gas, etc.) will be saved on a yearly basis. We will present this information using a website with an interactive map. The map will segment neighborhoods based on their environmental rating. Users can interact with the website by clicking on their neighborhood which will then provide information on ways they can decrease their energy dependence, and how the neighborhood environmental rating would improve if those methods are implemented.

To accomplish this task, we will use the City of Chicago API to gather data about energy usage per neighborhood in addition to information on recycling centers, and collection routes. Additionally, we will use the United States Energy Information Administration (EIA) API for more information about energy usage in Chicago neighborhoods.

We plan to keep ourselves on track by using the following timeline. By week six we will have extracted and organized all of our data in data structures that are easy to read. By week eight we will have the map visualization and the website's basic template working. We will spend the remaining time until the due date implementing algorithms that will calculate energy saved, money saved, and rating improvements. We will also use this time to provide useful information on how certain neighborhoods can improve their rating based on categories they scored poorly on. By this time the website and map visualization will be fully functional.

This project will be accomplished by using the following three new programming technologies: Django to implement the website, the PANDAS library and Basemap toolkit for the map visualization, and quicksort algorithms to help us rank neighborhoods by their energy efficiency.