Temple Analytics Challenge - Merck Challenge

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With its recent relocation, Merck would like to understand the impact of this relocation on the employees. The challenge presented is to characterize, quantify, and visualize this impact.

Impact of Relocation

The way our team tackled this challenge is by quantifying the impact into minutes of commute. We believe the duration of commute is be the best indication of employee satisfaction of the relocation. To determine the change in commute duration for every zip code, we first wrote a script that reorganizes the data given by Merck and lists the following attributes of each zip code: Number of employees, Number of employees in organization (A-L), commute duration to Whitehouse Station, NJ (zip code: 08889), commute duration to Kenilworth, NJ (zip code: 07033), commute duration to West Point, PA (zip code: 19486), the comparison of commute duration for Whitehouse Station and Kenilworth, and the comparison of commute duration for Whitehouse station and West Point.

To obtain commute durations, we used a Google maps python library (https://pypi.python.org/pypi/googlemaps/) to calculate the distance and commute duration given the zip code of the employee and relocation. Saving the resulted data from above allows us to transfer the data to a map through using openheatmap.com. Four sets of maps were created:

- Change in duration per zip code to Kenilworth
- Change in duration per zip code to West Point
- Change in duration to Kenilworth (Weighted by population of the zip code)
- Change in duration to West Point (Weighted by population of the zip code)

Organizational Impact

To find the impact on each organization, we used the commute duration data and manipulated it in python to calculate the average change in commute duration per each organization. The data was then organized into tables in excel for presentation.

Finding an Ideal Location

The last task we have to tackle is to find the ideal relocation site. To do this we begin by finding the zip codes local to most employees. To narrow down the ideal location, we set the maximum drive duration to Whitehouse Station to be 1 hour. Due to the fact that there were employees that live hours away from Whitehouse Station, it was fair to assume that many worked remotely, therefore we established that those with commute duration of an hour or less actually commutes to work. With two sets of zip codes, we then had to calculate the commute duration from every possible zip codes to every possible ideal location (nearly 85,000 google map requests). This was achieved by utilizing the Google maps library. With such a great amount of requests, Google API key had to be obtained to increase request limits. We also had to write the code so that it captures request failures to prevent loss of data. The code has to auto save data from each run in case of exceeding limit or prolonged timeouts.

Code Repository (Github)

All code can be found on the group repository linked below.
(https://github.com/cdvalenti/temple_analytics)