Clustering cities near military base for ease of Permanent Change of Station (PCS)

LIZ M

Helping families find cities to live in near their next PCS location

- Hundreds of families are moved across the country and the world every year following the call of their nation.

- When military members get orders for a new location, their whole family (whether that includes children, spouses, pets) usually all go with them.

- Military bases can have several towns located around it and finding what towns work best for each family can be difficult especially since these individuals may have never moved to this location before.

- Homebuying can be daunting in an unknown area but having a group of similar towns based on places located in the towns and then the break down of these clusters with home prices can make it easier for families to narrow down where to search for a home.
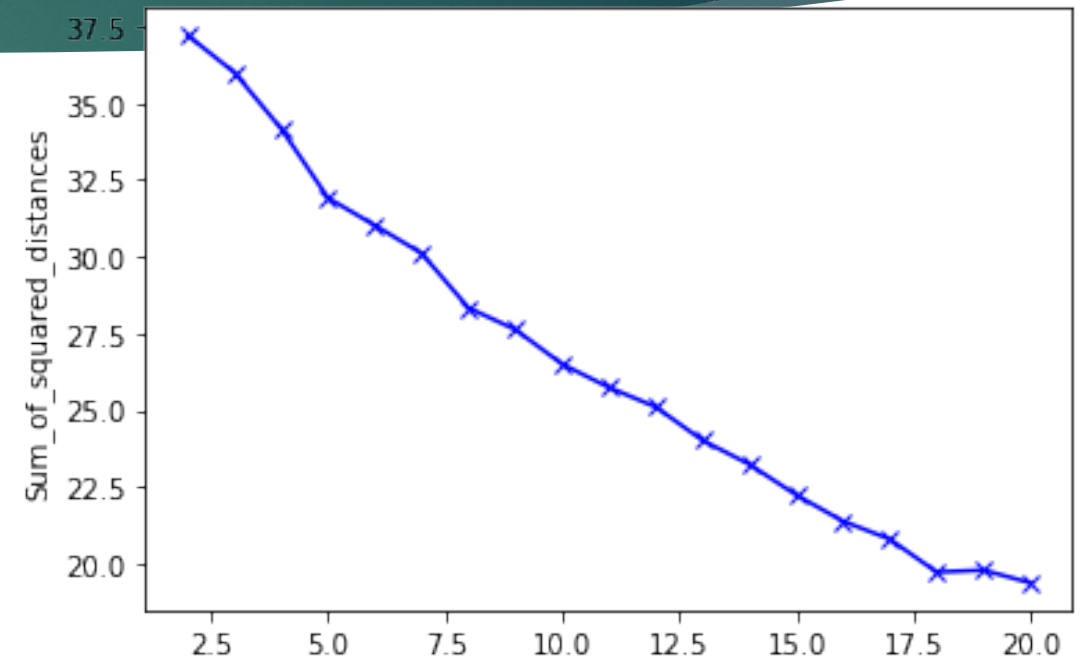
Data Acquisition and cleaning

- Data from zipcodestogo.com and Zillow.com.

- Location data gathered from the geopy python package and venue data gathered from the Foursquare API

- Duplicate rows and unnecessary columns were dropped.

- 117 cities made the final clusters

Elbow Method

Elbow Method For Optimal k

- ▸ Within-Cluster-Sum-of-Squares used for the Elbow method.

- ▸ The distance between a line and a point was used to find the optimal k in kmeans clustering

$$\text{distance}(P_0, P_1, (x, y)) = \frac{|(y_1 - y_0)x - (x_1 - x_0)y + x_1 y_0 - y_1 x_0|}{\sqrt{(y_1 - y_0)^2 + (x_1 - x_0)^2}}$$

Cluster Results and Conclusions

- 104 of 117 towns were included in 2 clusters

- Most clusters had an average home value in the $400,000

- Most common venues within clusters include parks, flower shops, various restaurants, and farmers markets

- Location data not always accurate

- Too many clusters

- A lot of overlap possible between towns based on distance from each other

Future Direction

- Include more accurate location data such as Google API
- Include more city characteristics such as crime data and school ratings
- Include rental data