A Comparison of Locations in the Washington DC Metro Area

A PRESENTATION FOR THE IBM APPLIED DATA SCIENCE CAPSTONE COURSE ON COURSERA

Introduction

- Company ABC is looking for locations for their new office space, with two requirements:
  - ❑The location should be similar to Alexandria, VA, where their current office is located
  - ❑Locations should be limited to the Washington DC Metro area

Data

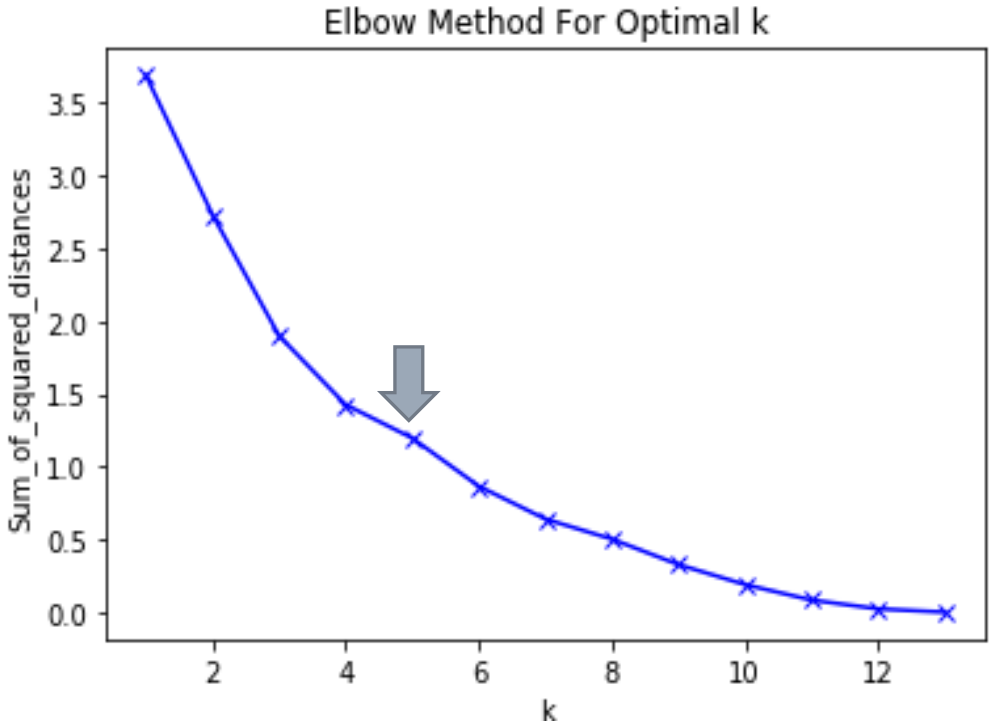
- List of counties in the DC Metro area
- Table of counties in the US, including geographic coordinates
- Foursquare API to gather venue data for locations by geographic coordinates

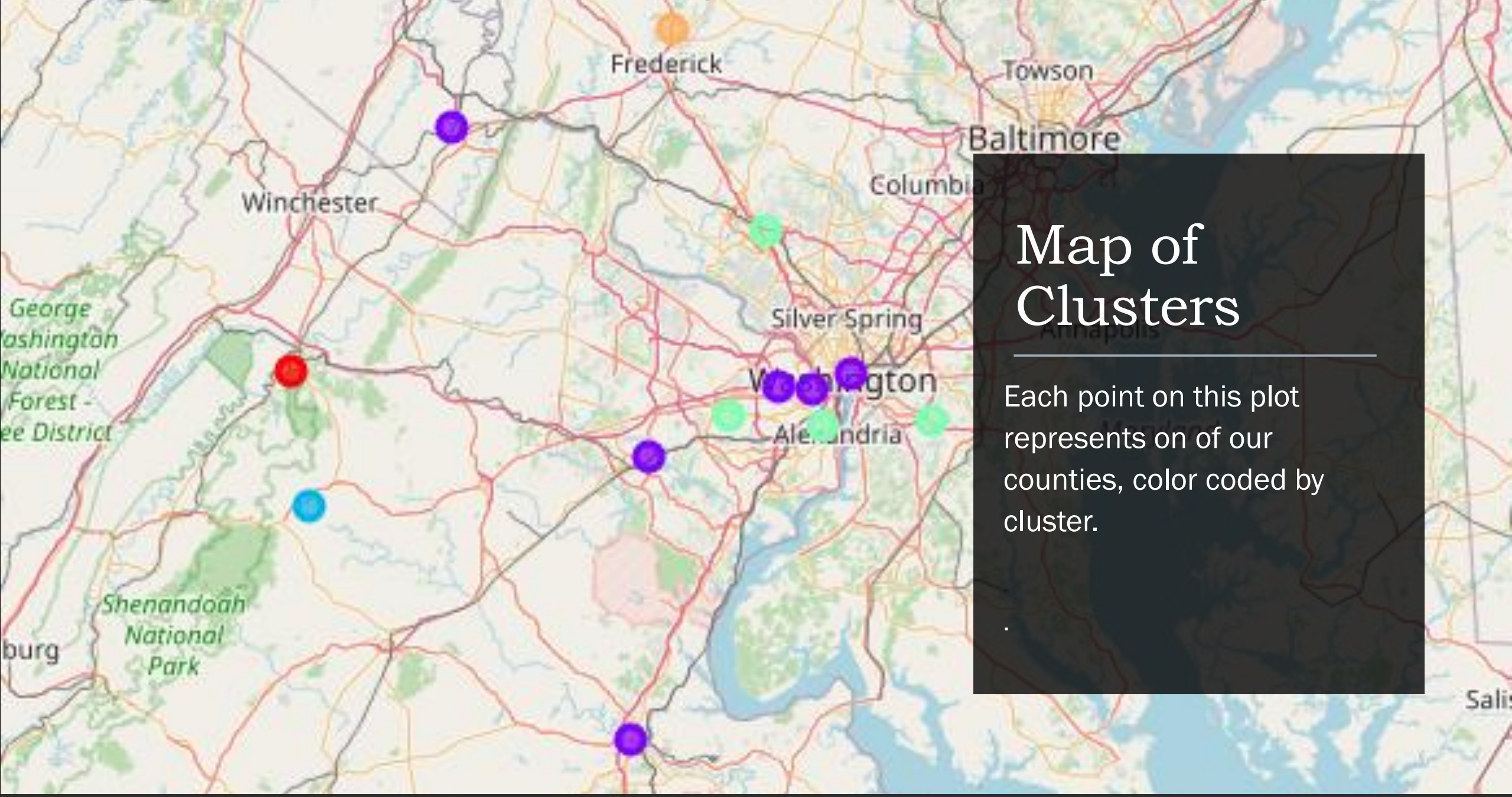
Data Manipulation

- Use Foursquare API to get info on up to 100 venues for each county
- Use one hot encoding and grouping data to get a dataframe where each row is a county and the proportion of each venue type in that location
- Determine the top 10 most common venues for each county

Analysis

- We want to cluster our counties into similar groups based on our county data
- k-means clustering
  - Determine optimal k value with Elbow method]





Map of Clusters

Each point on this plot represents on of our counties, color coded by cluster.

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Clusters by County

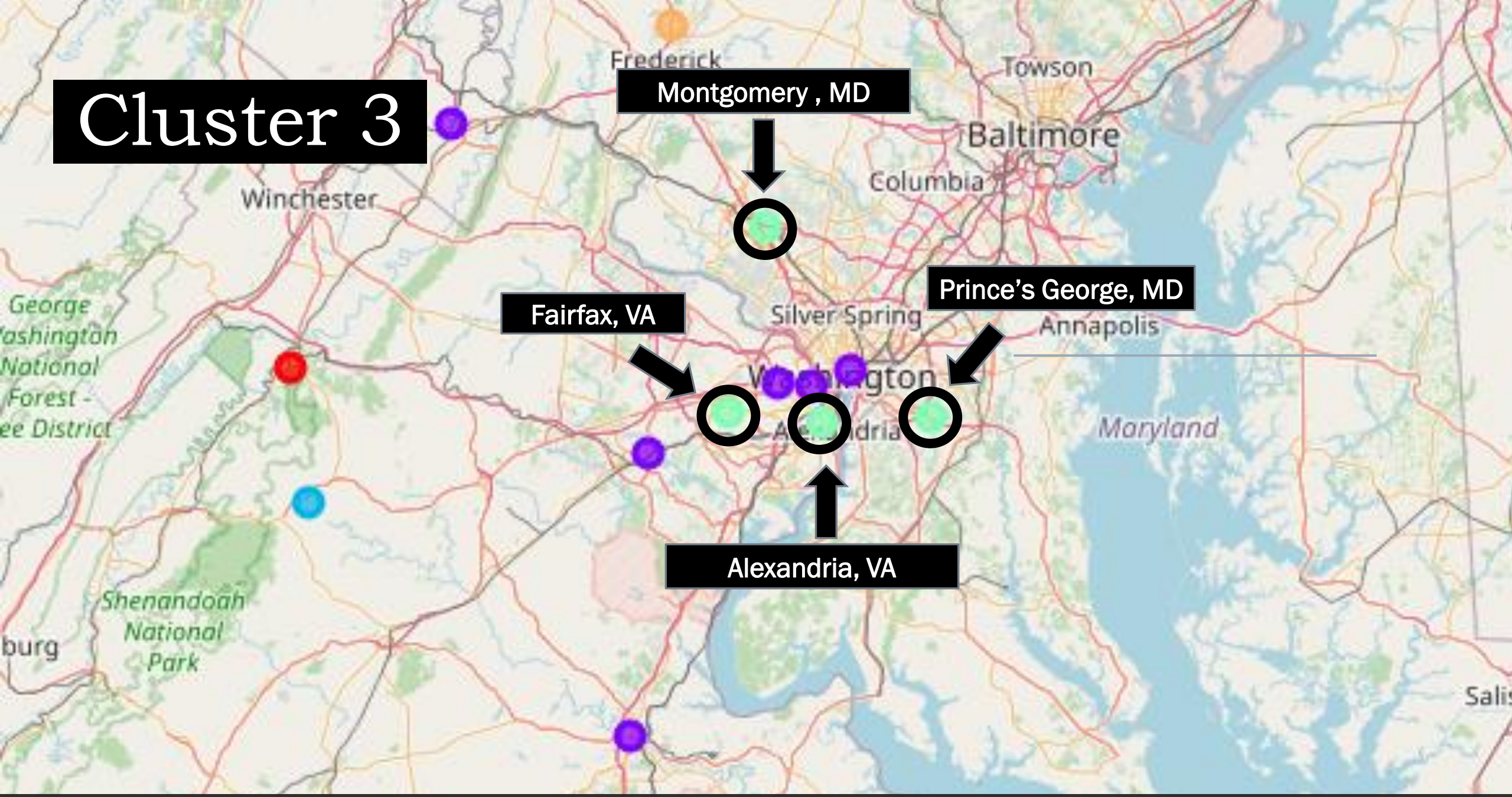
County	Cluster Label
Arlington, VA	1
Fairfax, VA	3
Rappahannock, VA	2
Warren, VA	0
Alexandria, VA	3
Falls Church, VA	1
Fredericksburg, VA	1
Manassas Park, VA	1
Frederick, MD	4
Montgomery, MD	3
Prince George's, MD	3
District of Columbia, DC	1
Jefferson, WV	1

We have 5 clusters of varying sizes:

- **Cluster 0:** Warren, VA
- **Cluster 1:** Arlington, VA; Falls Church, VA; Fredericksburg, VA; Manassas Park, VA; District of Columbia, DC; Jefferson, WV
- **Cluster 2:** Rappahannock, VA
- **Cluster 3:** Fairfax, VA; Alexandria, VA; Montgomery, MD; Prince's George, MD
- **Cluster 4:** Frederick, MD

Recall our research question: Company ABC is looking for locations that are similar to Alexandria, VA, which is in Cluster 3.

Cluster 3


Montgomery , MD
Fairfax, VA
Prince’s George, MD
Alexandria, VA
Frederick
Towson
Baltimore
Columbia
Winchester
Silver Spring
Annapolis
Maryland
Shenandoah
National
Park

Conclusion

- Company ABC's requirements:
  - ☑ The location should be similar to Alexandria, VA, where their current office is located
  - ☑ Locations should be limited to the Washington DC Metro area

Our recommendation:

- Given the results of our k-means clustering, we recommend that Company ABC search for their new office space in the following counties:
  - Alexandria, VA
  - Fairfax, VA
  - Montgomery, MD
  - Prince's George, MD