Deciding the Best County in Virginia to Open a New Supermarket in

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Introduction

- Factors in having a competitive advantage in opening a supermarket:
  - Brand – Recognition of the name of the supermarket
  - Offering – Variety of products offered
  - Quality – Quality of products offered
  - Pricing – Price range of products
  - Location – Where the supermarket is located

Data Acquisition

https://demographics.coopercenter.org
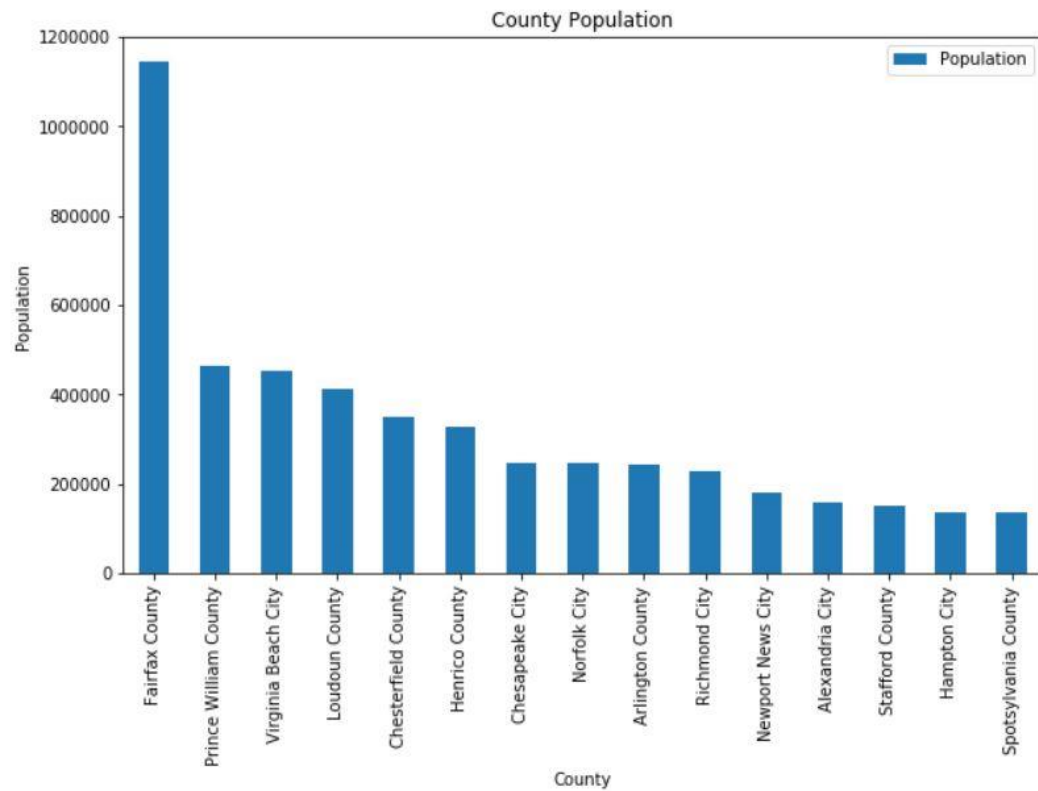
https://datausa.io/profile/geo/virginia
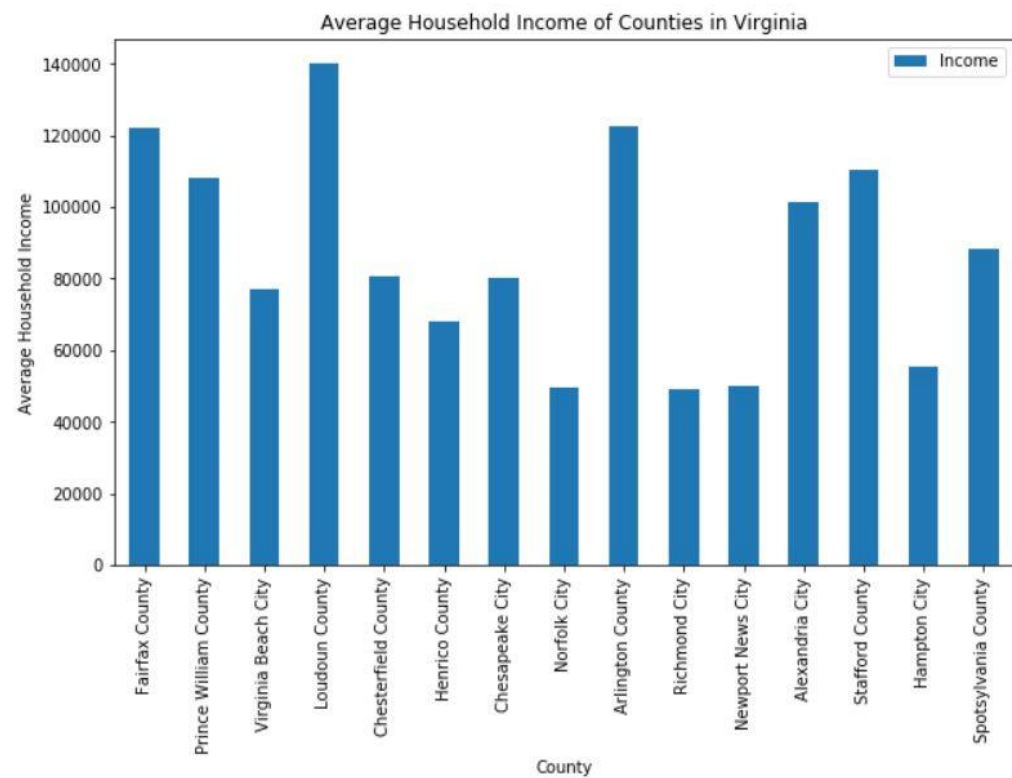
Python Geocoder

Foursquare Developer Portal

Data Cleaning

- Sorted based on Population in Descending Order

- Dropped Unnecessary Columns

- Renamed County Names in Second Table

- Merged the Population and Income Tables

- Added Geographical Data

- Added Number of Supermarkets Acquired from Foursquare
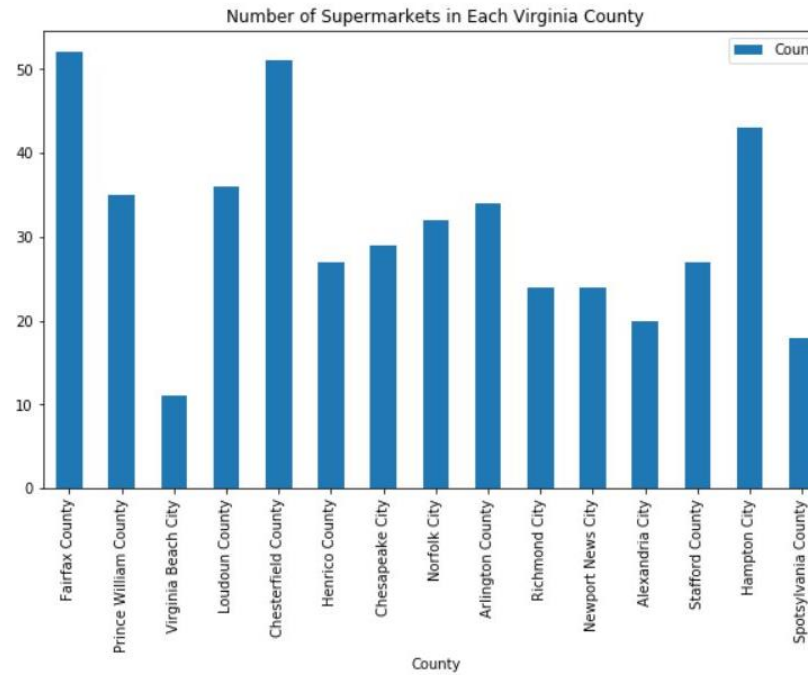
Data Exploration

▶ Virginia – 133 Counties/Major areas

▶ Top 15 Counties based on population:

Data Exploration
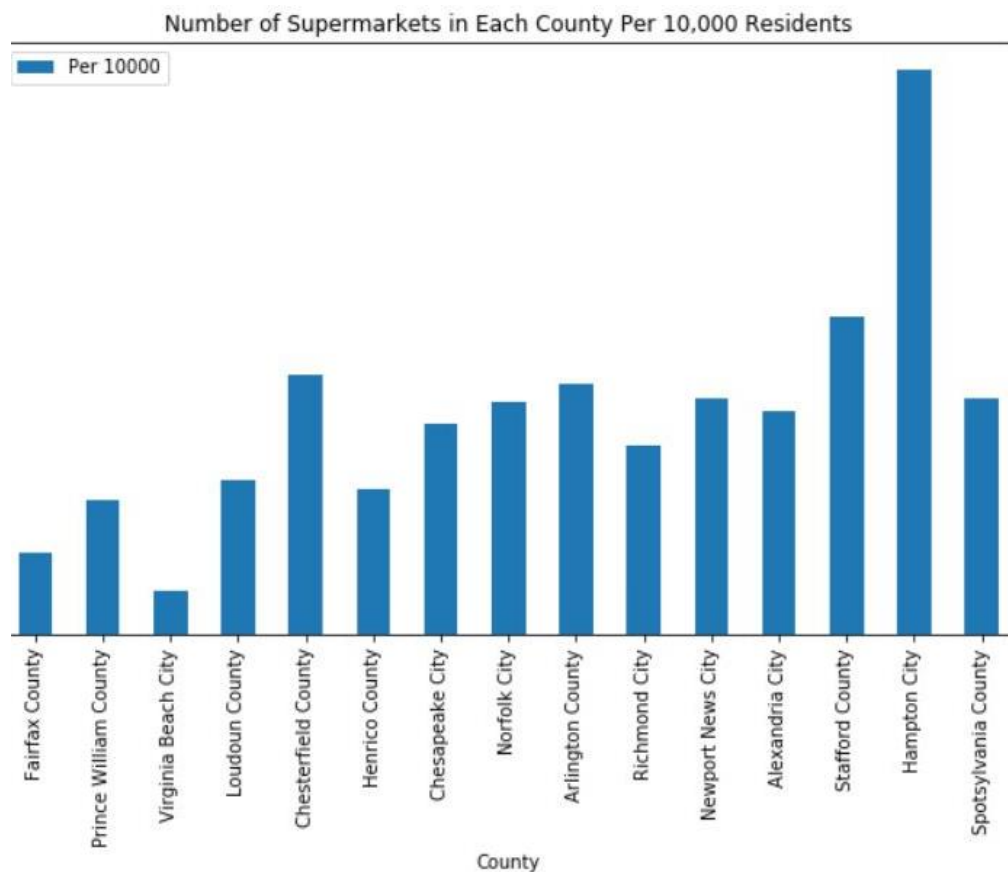
Average Household Income of Each County:

Data Exploration

Number of Existing Supermarkets

Number of Supermarkets in Each County Per 10,000 Residents

Data Exploration
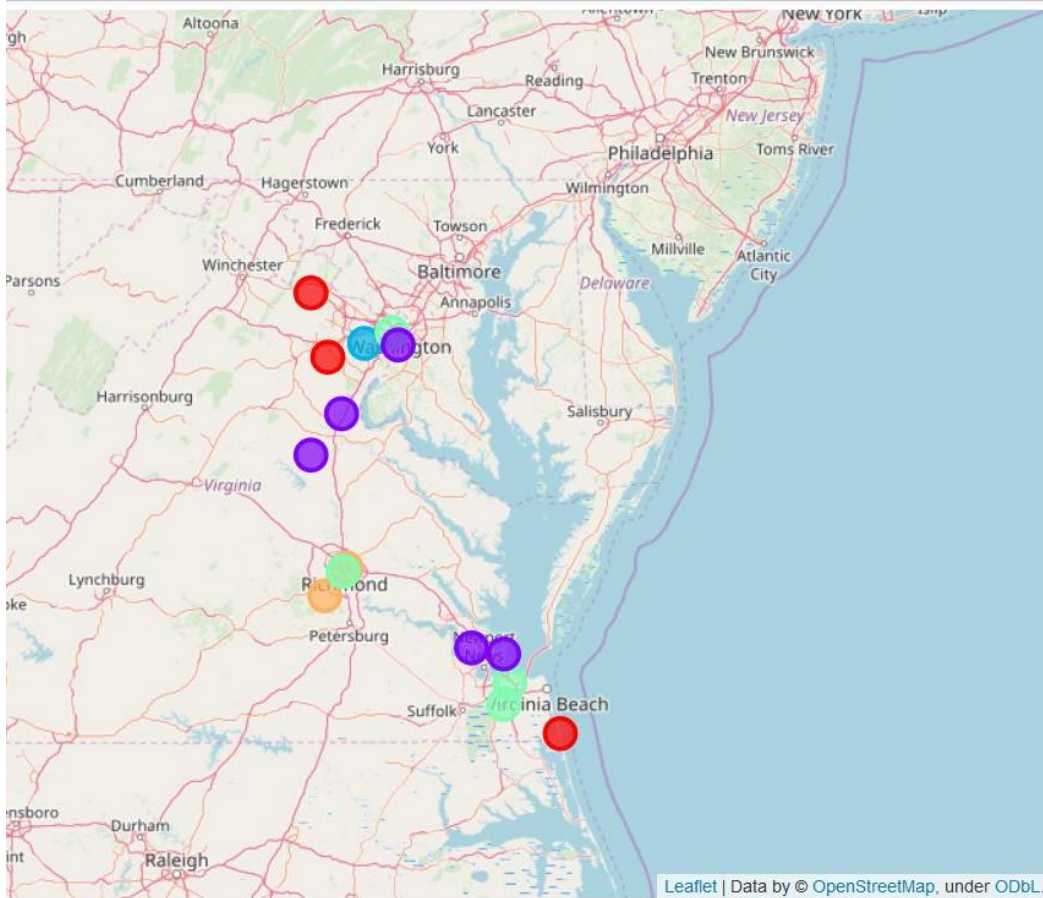
Number of Supermarkets for Every 10,000 Residents of the County

Clustering

- Best Clusters Based on Characteristics:
  - Cluster 2
  - Cluster 0
  - Cluster 4
  - Cluster 3
  - Cluster 1

Cluster Labels	Population	Income	Count	Per 10000
0	4.438957e+05	108299.666667	27.333333	0.621807
1	1.526618e+05	81119.800000	26.400000	1.771282
2	1.143528e+06	122227.000000	52.000000	0.454733
3	2.399480e+05	75308.250000	29.750000	1.237002
4	3.398795e+05	74362.000000	39.000000	1.137328

	Cluster Labels	Population	Income	Count	Per 10000	County
0	2	1143528	122227	52	0.454733	Fairfax County
1	0	465498	107925	35	0.751883	Prince William County
2	0	452643	77059	11	0.243017	Virginia Beach City
3	0	413546	139915	36	0.870520	Loudoun County
4	4	350760	80655	51	1.453986	Chesterfield County
5	4	328999	68069	27	0.820671	Henrico County
6	3	245745	80265	29	1.180085	Chesapeake City
7	3	245054	49587	32	1.305835	Norfolk City
8	3	242152	122394	34	1.404077	Arlington County
9	3	226841	48987	24	1.058010	Richmond City
10	1	181000	50180	24	1.325967	Newport News City
11	1	159152	101215	20	1.256660	Alexandria City
12	1	151689	110307	27	1.779958	Stafford County
13	1	135753	55466	43	3.167517	Hampton City
14	1	135715	88431	18	1.326309	Spotsylvania County

Counties and Their Clusters

Counties on Map

Conclusion

- ▶ Should start with cluster 2 as primary location and then cluster 0

- ▶ Algorithm Usable for Different States (Slight Modification)

- ▶ To Enhance model, More Data Is Necessary:

  - ▶ Distance to Nearest Supermarket

  - ▶ Population Based on Race

  - ▶ City Data as Opposed to Only County Data