

# Purple State Plunge: A Deep Dive into Pennsylvania's Cities

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COURSERA CAPSTONE PROJECT

BY

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# Purpose

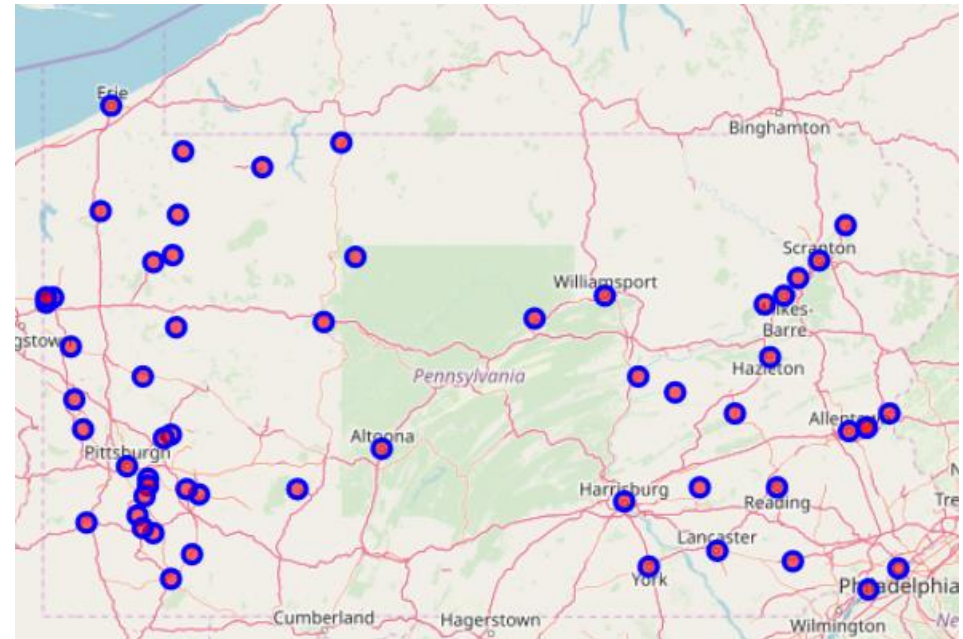
- Explore the population growth trends among the cities of Pennsylvania between the years of 2010 and 2018
- Leverage the data from Foursquare to cluster these cities together based on the cities' venues.
- This clustering can then be used to characterize growing and declining cities based on the most common venues in those cities, which can be used to determine where and how to direct business investments.

# Data Sources

## ► 2010 Census Data

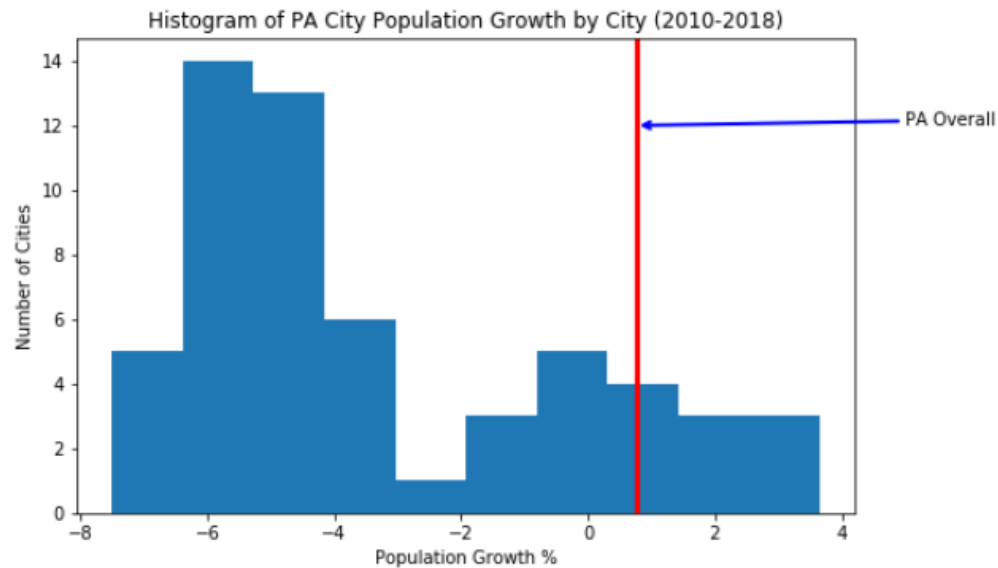


## ► PA City Coordinates

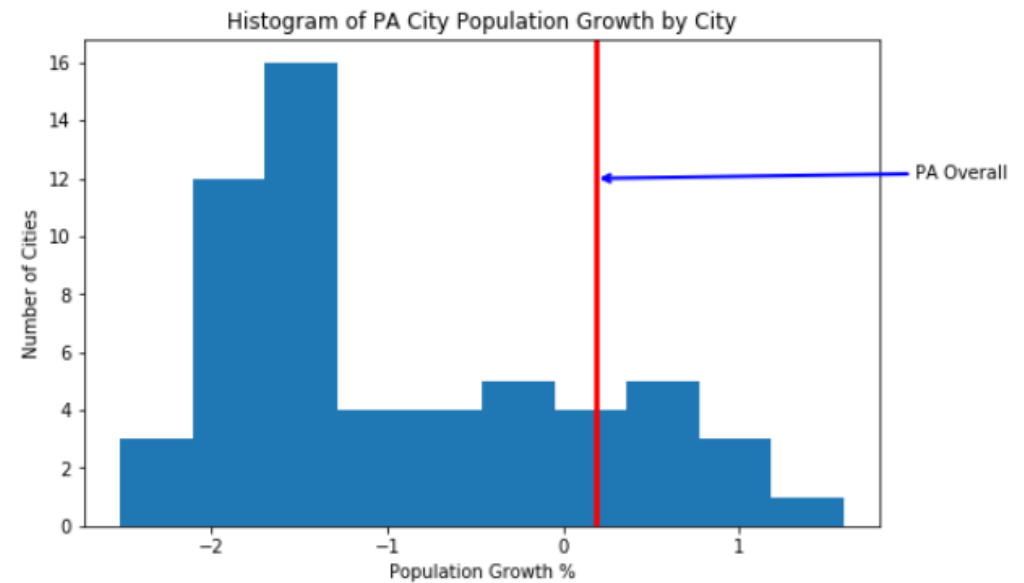


# PA City Population Growth vs State Overall

## 9-Year Period

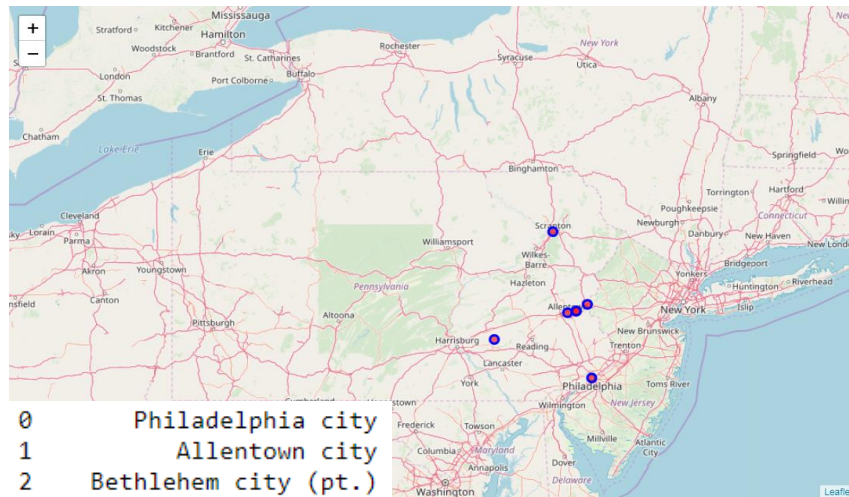


## 2-Year Period



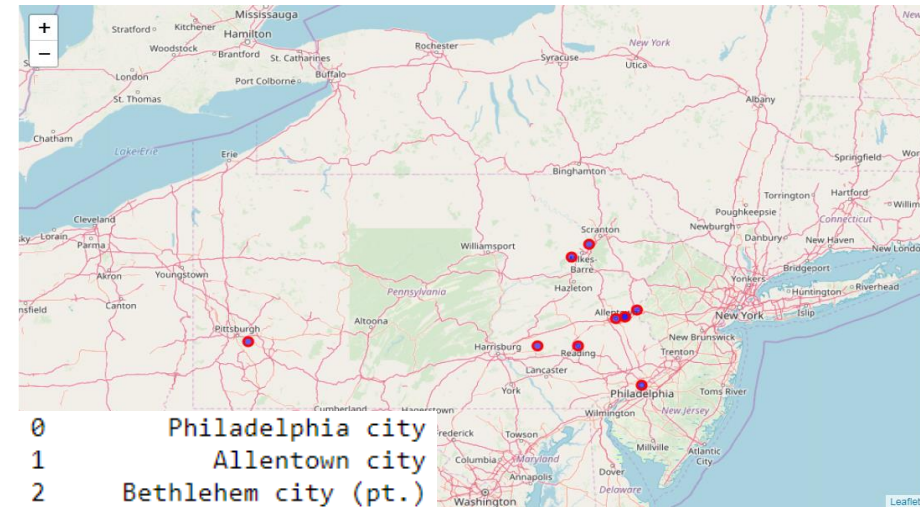
# PA City Population Growth vs State Overall

## Growing Populations (2010-2018)



```
0 Philadelphia city
1 Allentown city
2 Bethlehem city (pt.)
3 Lebanon city
4 Easton city
5 Scranton city
6 Bethlehem city
Name: NAME, dtype: object
```

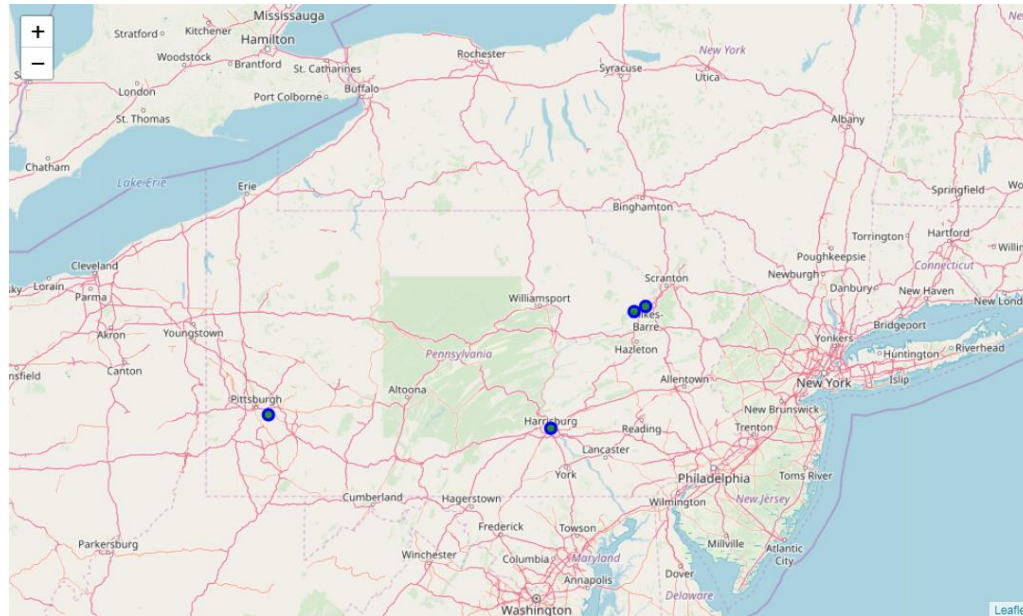
## Growing Populations (2016-2018)



```
0 Philadelphia city
1 Allentown city
2 Bethlehem city (pt.)
3 Lebanon city
4 Easton city
6 Bethlehem city
8 Reading city
9 Pittston city
13 Duquesne city
15 Nanticoke city
Name: NAME, dtype: object
```

# “Hopeful Cities”

- Experienced population decline over 2010-2018
- Population growth from 2016-2018
- Potential for economic rejuvenation

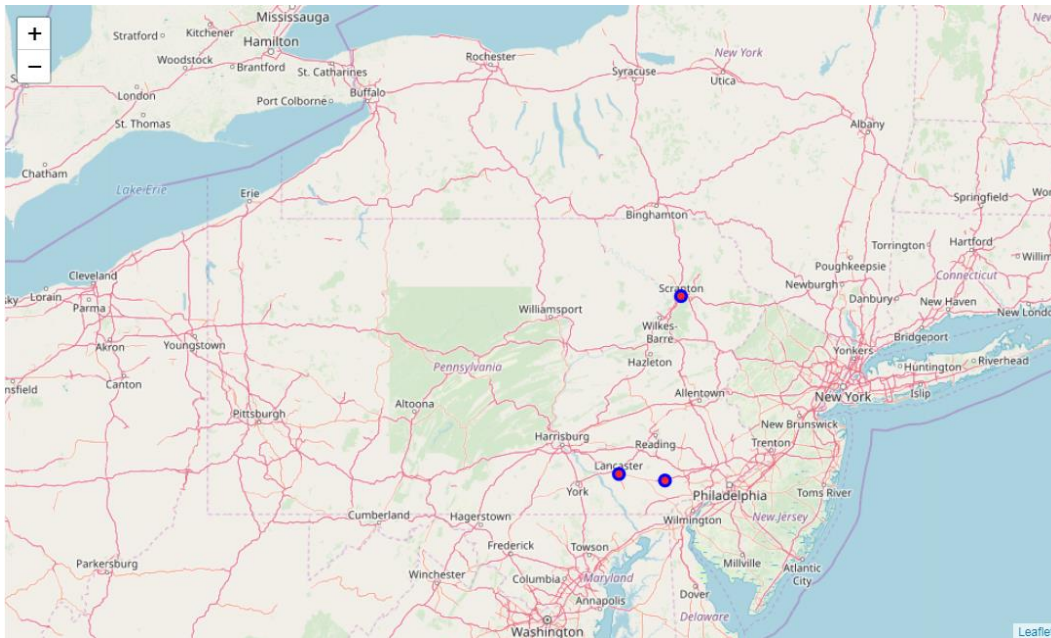


```
13      Duquesne city
14      Harrisburg city
15      Nanticoke city
17      Wilkes-Barre city
Name: NAME, dtype: object
```



# “Slowing Cities”

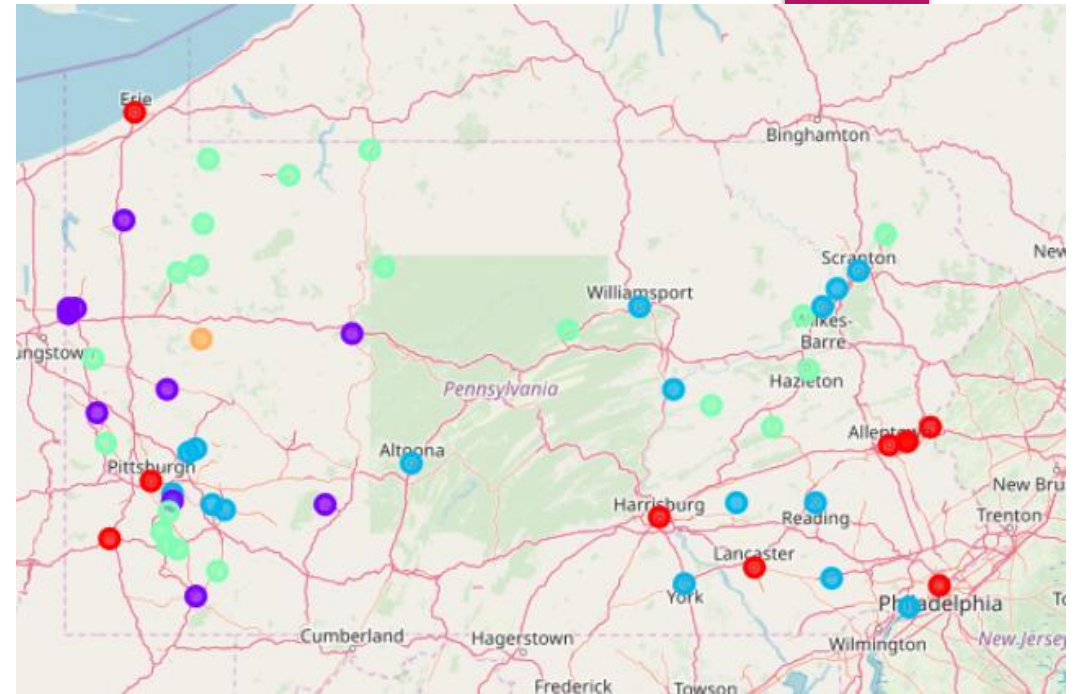
- Experienced population growth over 2010-2018
- Population decline from 2016-2018
- Potentially in the midst of an economic downturn



5 Scranton city  
10 Coatesville city  
11 Lancaster city  
Name: NAME, dtype: object

# Clustering

- All 57 cities are clustered based on most common venues in Foursquare
- 5 Clusters Total



Cluster #1: Big Cities

Cluster #2: Small Western Cities

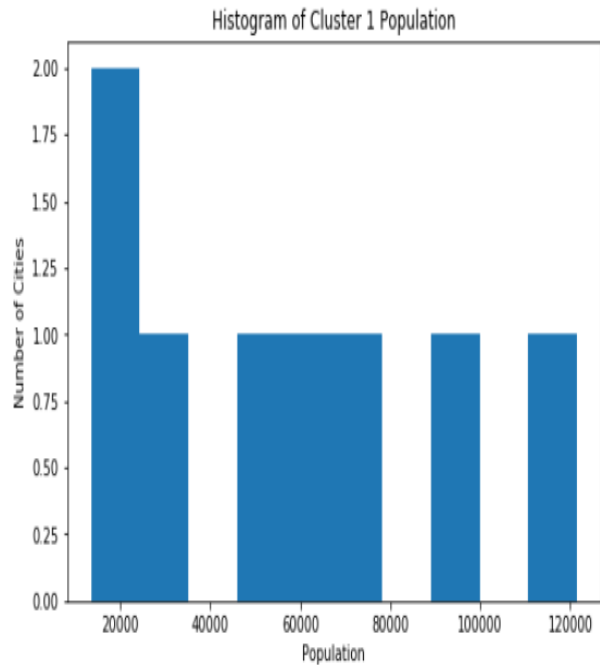
Cluster #3: "Purple State PA"

Cluster #4: Small Declining Cities

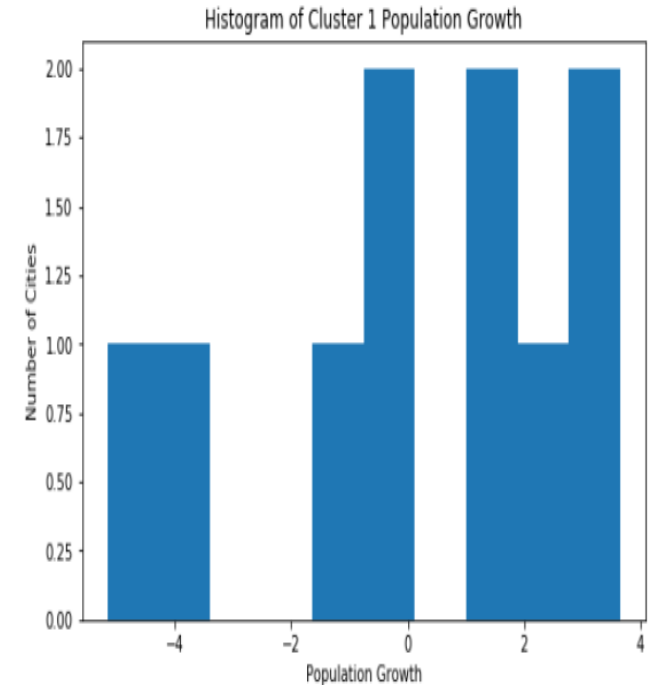
Cluster #5: Parker City, PA



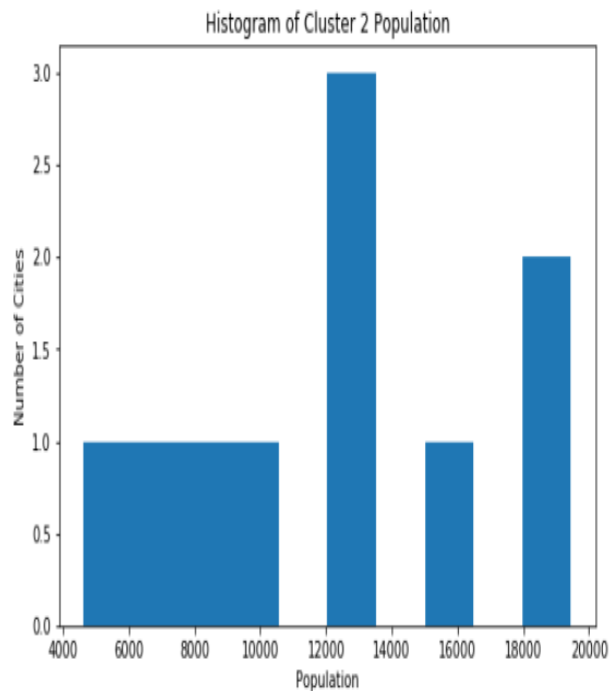
# Cluster #1: Big Cities



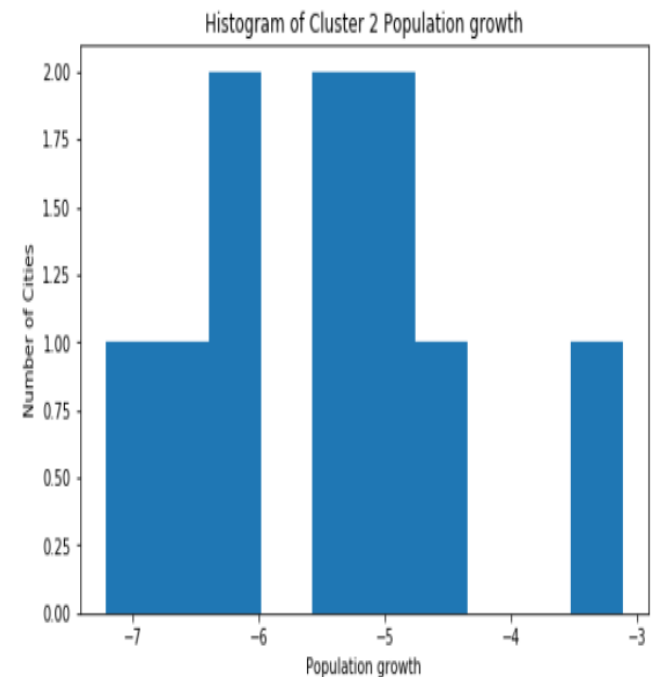
- Defined by large populations
- Combination of east/west coasts
- Combination of declining/growing populations
- Contains 2 of the “Hopeful Cities”



# Cluster #2: Small Western Cities

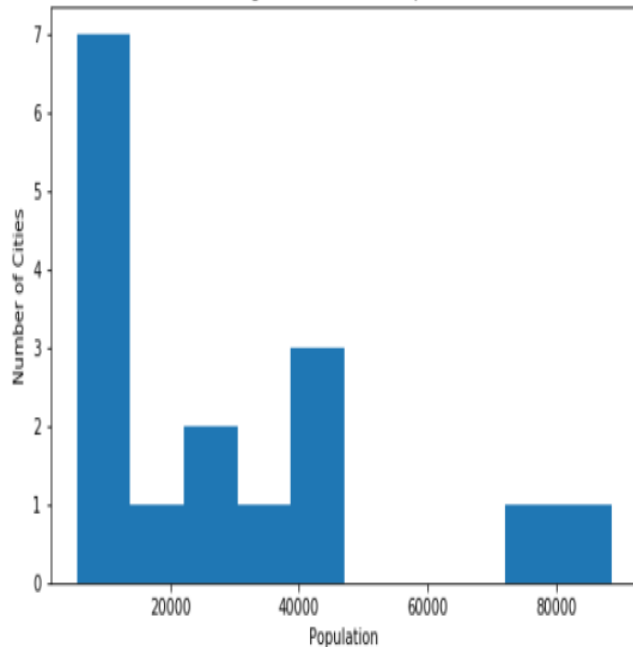


- Population < 20,000
- All lie on West Coast
- All have declining populations



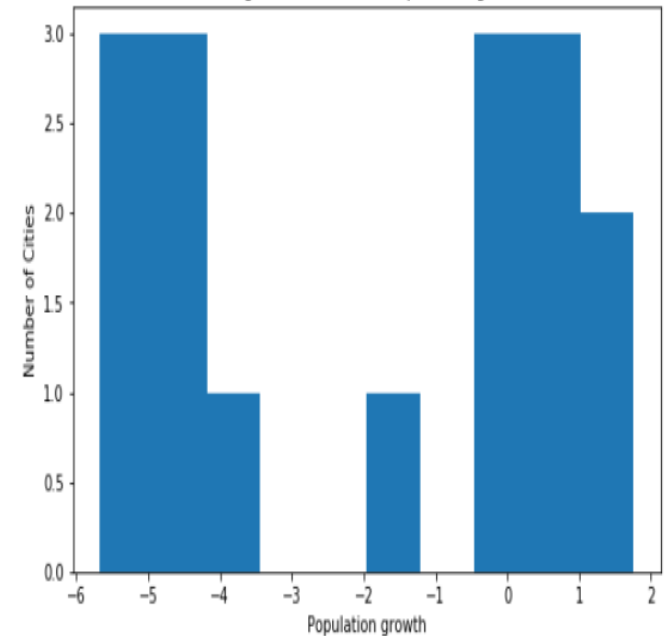
# Cluster #3: “Purple State PA – The Representative Sample

Histogram of Cluster 3 Population



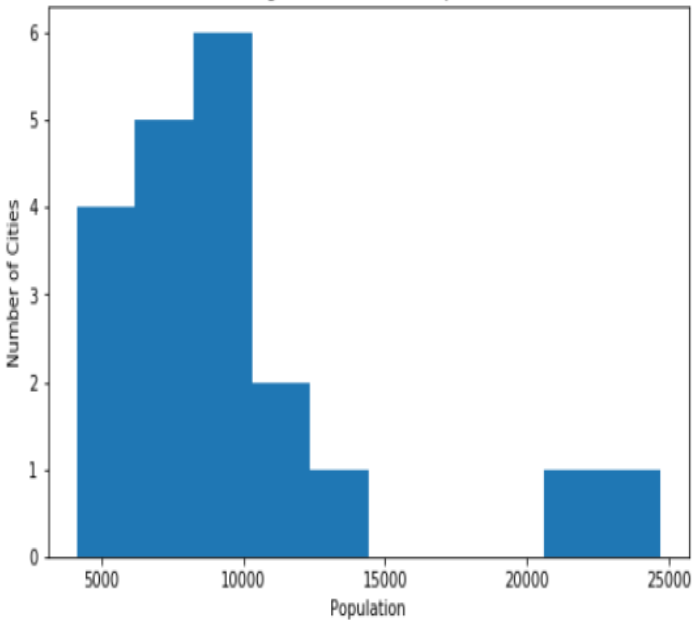
- Combination of East & West coast
- Combination of high & low populations
- Combination of growing & declining populations
- A “Swing” cluster in a “Swing State”

Histogram of Cluster 3 Population growth



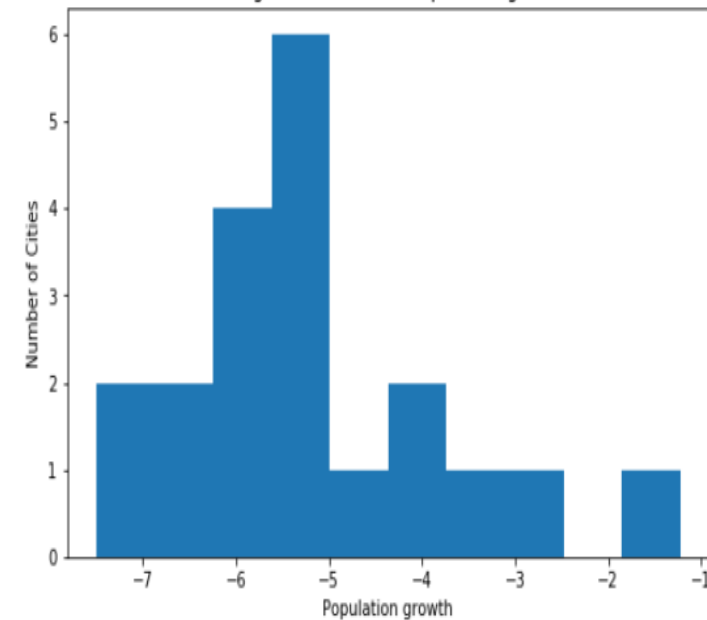
# Cluster #4: Small, Declining Cities

Histogram of Cluster 4 Population



- 12 of 20 have populations < 10,000
- All 20 cities in this cluster have seen declining populations from 2010-2018
- Nanticoke City – The sole “Hopeful City”

Histogram of Cluster 4 Population growth



# Cluster #5: Parker City, PA

- A single-city cluster
- Known as “The Country’s Smallest City”
- Population of around 800 people



# Conclusions

- Analysis shows that, although cities were clustered based on most common venues, these clusters also seemed to coincide with population size, geographic location.
- Frequency of venues are influenced by local culture and demographic preferences
- Results can be used to inform potential investments and business decisions