

Introduction/Business Problem

The Great Smoky Mountains are a great area to retire. There are many recreational places to do outdoor activities such as fishing and hiking. When it comes to retirement, many people are looking for a location that has good healthcare and plenty of outdoor activities. But how would one go about picking a good location?

The state of Tennessee is a good section of the Great Smoky Mountains because they do not have any state income tax. There are two major cities in Tennessee near the Great Smoky Mountains, Knoxville and Chattanooga. This project will look at the characteristics of the neighborhoods in both cities and make a recommendation as to which is the best city to retire based on the healthcare and outdoor activities available nearby.

Data Description

To determine which city and neighborhood in either Knoxville or Chattanooga, Tennessee would be the best place to retire, Wikipedia will be used to gather some information about each city, including the neighborhoods. Folium will be used to map the neighborhoods and get an idea of the healthcare and outdoor activities available in each city.

The neighborhood information from Wikipedia was used in geolocator to determine the latitude and longitude for each neighborhood in Chattanooga and Knoxville. The location information was then used with to call the Foursquare API to find the healthcare facilities and outdoor activities near each neighborhood. A search on the categories available in Foursquare found the following categories which were used for this project: 4d4b7105d754a06377d81259 - Outdoors and Recreation - was be used to determine the outdoor activities near each neighborhood 4bf58dd8d48988d104941735 - Medical Center - was be used to determine the healthcare facilities near each neighborhood

This information was then used to make a recommendation as to which neighborhood would be the best retirement location.

Methodology

There were four major components to this analysis:

1. Gather neighborhood information on Knoxville and Chattanooga from Wikipedia
2. Clean up the data from Wikipedia and determine the location of each neighborhood using geolocator
3. Use the location information to gather information on each of the following categories for each neighborhood from Foursquare:
 - Healthcare
 - Restaurants
4. Map the Foursquare information and determine the ideal location

Gather neighborhood information on Chattanooga and Knoxville from Wikipedia

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In [157]: #The following neighborhoods were found in Chattanooga:  
neighborhood
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```
Out[157]: ['East Brainerd, Tennessee',  
           'Highland Park, Chattanooga',  
           'Hixson, Tennessee',  
           'Lookout Valley, Tennessee',  
           'Lupton City, Chattanooga',  
           'Ridgeside, Tennessee',  
           'Tiftonia, Tennessee',  
           'Tyner, Tennessee']
```

```
In [162]: #The following neighborhoods were found in Knoxville:  
neighborhood
```

```
Out[162]: ['Bearden, Knoxville',  
           'Chilhowee Park, Knoxville',  
           'Colonial Village, Knoxville',  
           'Cumberland Estates',  
           'Downtown Knoxville',  
           'East Knoxville',  
           'Forest Heights, Knoxville',  
           'Fort Sanders, Knoxville',  
           'Fountain City, Knoxville',  
           'Fourth and Gill, Knoxville',  
           'Island Home Park, Knoxville',  
           'Lake Forest, Knoxville',  
           'Lindbergh Forest',  
           'Lonsdale, Knoxville, Tennessee',  
           'Mechanicsville, Knoxville',  
           'North Knoxville, Knoxville, Tennessee',  
           'Norwood, Knoxville',  
           'Oakwood-Lincoln Park',  
           'Old City, Knoxville',  
           'Old North Knoxville',  
           'Parkridge, Knoxville',  
           'Rocky Hill, Knoxville',  
           'Sequoyah Hills, Knoxville',  
           'South Knoxville',  
           'University of Tennessee',  
           'West Hills, Knoxville',  
           'West Knoxville']
```

Clean up the data from Wikipedia and determine the location of each neighborhood using geolocator

The location information was found for each neighborhood and added to a dataframe for each city.

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In [159]: #Below is the new dataframe for Chattanooga:  
df2
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Out[159]:

	Neighborhood	latitude	longitude
0	East Brainerd, Tennessee	34.995908	-85.150230
1	Highland Park, Chattanooga	35.028685	-85.272179
2	Hixson, Tennessee	35.217807	-85.286116
3	Lookout Valley, Tennessee	35.020353	-85.366070
4	Lupton City, Chattanooga	35.105713	-85.264264
5	Ridgeside, Tennessee	35.034202	-85.246754
6	Tiftonia, Tennessee	35.049266	-85.356523
7	Tyner, Tennessee	35.062852	-85.157176

```
In [164]: #Below is the new dataframe for Knoxville:  
df1
```

Out[164]:

	Neighborhood	latitude	longitude
0	Bearden, Knoxville	35.932859	-84.002686
1	Chilhowee Park, Knoxville	35.998366	-83.882996
2	Colonial Village, Knoxville	35.919528	-83.882681
3	Cumberland Estates	40.184257	-77.018033
4	Downtown Knoxville	35.963200	-83.874300
5	East Knoxville	35.960395	-83.921026
6	Forest Heights, Knoxville	35.827578	-84.235752
7	Fort Sanders, Knoxville	35.959170	-83.934895
8	Fountain City, Knoxville	36.032026	-83.937408
9	Fourth and Gill, Knoxville	35.985916	-83.921851
10	Island Home Park, Knoxville	35.961106	-83.884009
11	Lake Forest, Knoxville	35.926751	-83.867681
12	Lindbergh Forest	41.110639	-75.943811
13	Lonsdale, Knoxville, Tennessee	35.985638	-83.957130
14	Mechanicsville, Knoxville	35.969145	-83.931845
15	North Knoxville, Knoxville, Tennessee	36.002027	-83.912407
16	Norwood, Knoxville	36.004248	-83.981576
17	Oakwood-Lincoln Park	36.266533	-86.744087
18	Old City, Knoxville	35.960395	-83.921026
19	Old North Knoxville	36.002027	-83.912407
20	Parkridge, Knoxville	35.981203	-83.906144
21	Rocky Hill, Knoxville	35.902859	-84.021298
22	Sequoyah Hills, Knoxville	35.940194	-83.969397
23	South Knoxville	35.943139	-83.898794
24	University of Tennessee	35.951439	-83.930679
25	West Hills, Knoxville	35.695915	-84.020739
26	West Knoxville	35.970058	-83.955371

Use the location information to gather information on each of the following categories for each neighborhood from Foursquare:

- Healthcare
- Outdoor Activities

The number of categories for each neighborhood were found for each category.

Results

There were only 6 unique categories for outdoor recreation in the Chattanooga area. The following number of outdoor recreation areas were found for each neighborhood in Chattanooga:

Highland Park, Chattanooga	1
Lookout Valley, Tennessee	4
Lupton City, Chattanooga	2
Ridgeside, Tennessee	1

There were a total of 27 unique categories for outdoor recreation in the Knoxville area. The following number of outdoor recreation areas were found for each neighborhood in Knoxville:

Bearden, Knoxville	3
Chilhowee Park, Knoxville	5
Colonial Village, Knoxville	1
Cumberland Estates	1
East Knoxville	20
Fort Sanders, Knoxville	9
Fountain City, Knoxville	1
Fourth and Gill, Knoxville	3
Island Home Park, Knoxville	2
Lake Forest, Knoxville	5
Lindbergh Forest	1
Mechanicsville, Knoxville	5
North Knoxville, Knoxville, Tennessee	2
Norwood, Knoxville	3
Oakwood-Lincoln Park	1
Old City, Knoxville	20
Old North Knoxville	2
Parkridge, Knoxville	5
Rocky Hill, Knoxville	2
Sequoyah Hills, Knoxville	1
South Knoxville	1
University of Tennessee	7
West Hills, Knoxville	1

There were only 2 unique categories for healthcare in the Chattanooga area. The following number of outdoor recreation areas were found for each neighborhood in Chattanooga:

Highland Park, Chattanooga	2
Lookout Valley, Tennessee	1

There are a total of 13 unique categories for healthcare facilities in the Knoxville area. The following number of healthcare facilities were found for each neighborhood in Knoxville:

Bearden, Knoxville	31
Chilhowee Park, Knoxville	1
East Knoxville	4
Fort Sanders, Knoxville	50
Fountain City, Knoxville	5
Fourth and Gill, Knoxville	2
Lake Forest, Knoxville	2 2
North Knoxville, Knoxville, Tennessee	1
Norwood, Knoxville	8
Old City, Knoxville	4
Old North Knoxville	1
Rocky Hill, Knoxville	4
South Knoxville	1
University of Tennessee	3

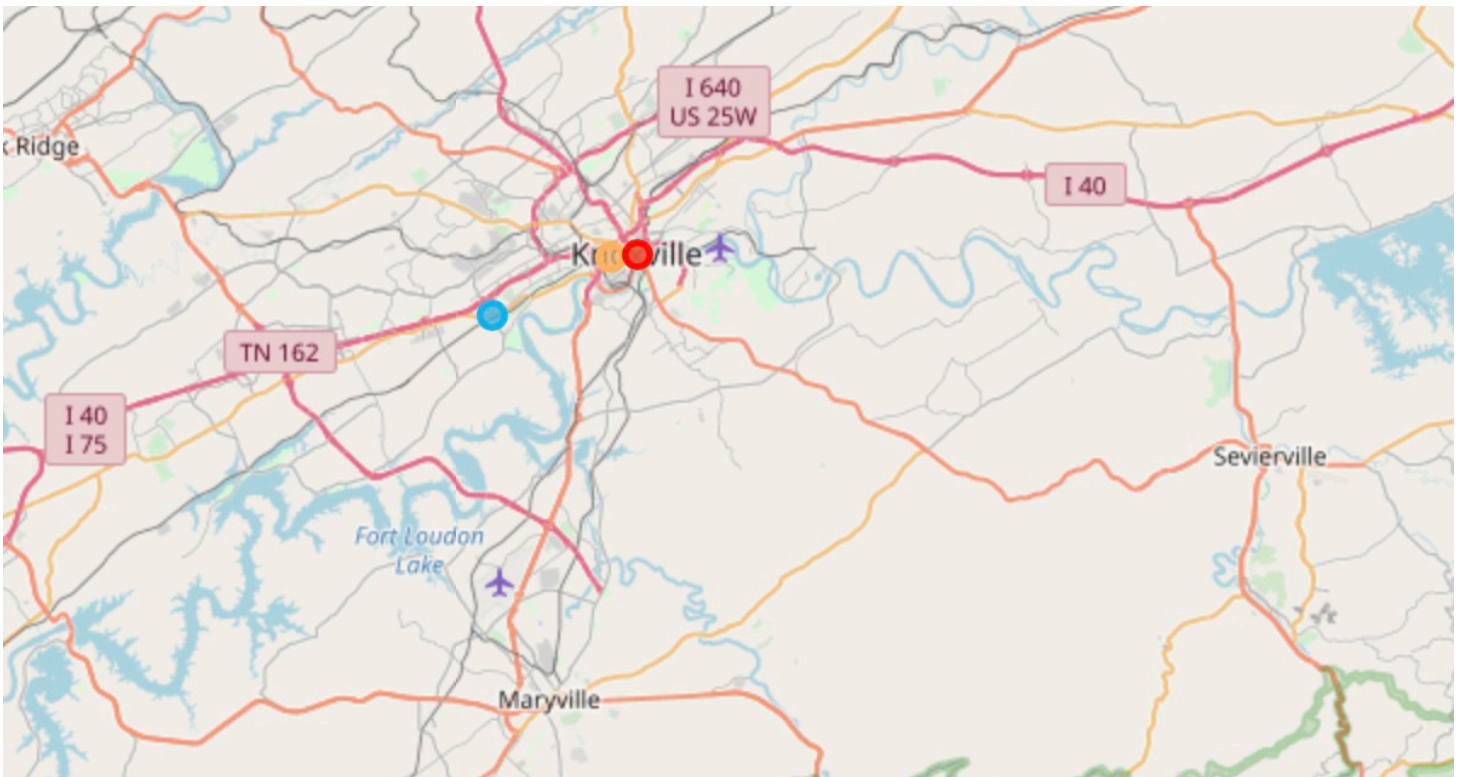
Discussion

As the number of both outdoor recreation areas and healthcare facilities in the Chattanooga area are very small, it is recommended that the Knoxville area be chosen for retirement.

In Knoxville, there are two neighborhoods, East Knoxville and Old City, that have a much larger number of recreation facilities with twenty each compared to only nine for the next highest neighborhood.

As far as healthcare is concerned there are also two neighborhoods in Knoxville with much higher counts, Fort Sanders with 50 and Bearden with 31.

Since the highest healthcare and recreation do not occur in the same neighborhoods, a map was produced to determine the location of these four neighborhoods of interest. It was found that East Knoxville and Old City were in the same location (shown in red on the map below). Fort Sanders is very close by (shown in orange on the map below) and Bearden is the furthest from the rest (shown in blue below).



Conclusion

To be nearest to the most combination of healthcare facilities and outdoor recreation facilities, the best location for retirement would be in the neighborhoods of Old City, East Knoxville, and Fort Sanders. These areas are shown on the map above in orange and red. This would give you the largest number of choices in the smallest geographic area.