

Battle of Neighborhoods – Provide Choices for Residential Homes based on School and child care needs

Anasuya Devi Kompella

IBM Data Science Capstone Project



Background



- Finding right school is a big challenge for parents and in case of public schools, there are a few more parameters to be considered.
- In USA, kids can only attend public schools that are assigned to their residence. So, if parents prefer a particular school, they need to reside in the geographical boundary assigned to the school.
- Hence choice of schools for kids influences the choice of houses the parents are likely to rent or buy.
- If parents are looking to buy a house, they would like to make sure that all levels of associated schools are good. And if they have child care needs like daycare, pre-school, having good facilities near by may also be factor that influences their decision



Problem Definition

- There are existing residential property search websites like HAR.com, Zillow.com etc. Search on these sites can be done in the following manner:
 - School search - Given an address, zipcode or city, lists out the schools (with filters for ratings and other scores) and then for each school, there is a link to search for homes in the school's boundary.
 - Home search - While searching for homes, under details of each home, associated school details are given with options to click on each school and get its ratings score etc.
- However if the requirement is to find out a list of neighborhoods in a city (or list of cities) that are best suited as per the family's educational and child care needs, the above mentioned sites do not cater to the same.
 - For eg: 1. Which are the neighborhoods that are best for families with teenage kids with good ratings of high school ?
 - 2. Which neighborhoods are best for families with young children who need daycares/pre-schools now and good elementary school going forward?



Data Sources

- List of Neighborhoods and their Geographical Coordinates
 - This list of neighborhoods was compiled offline from multiple sources as a csv file. It consists of Neighborhoods from a cluster of cities in Greater Houston.
 - Latitude and Longitude for each neighborhood is obtained
- List of schools and day cares within a given radius of each neighborhood.
- Ratings of each of the schools obtained from a centralized source
 - School rating – Rating assigned based on accountability scores of schools
 - Parent Rating – Computed based on the ratings given by parents

Sample Data

```
data = pd.read_csv(neighborhoodsFile)
data.head()
```

Out[3]:

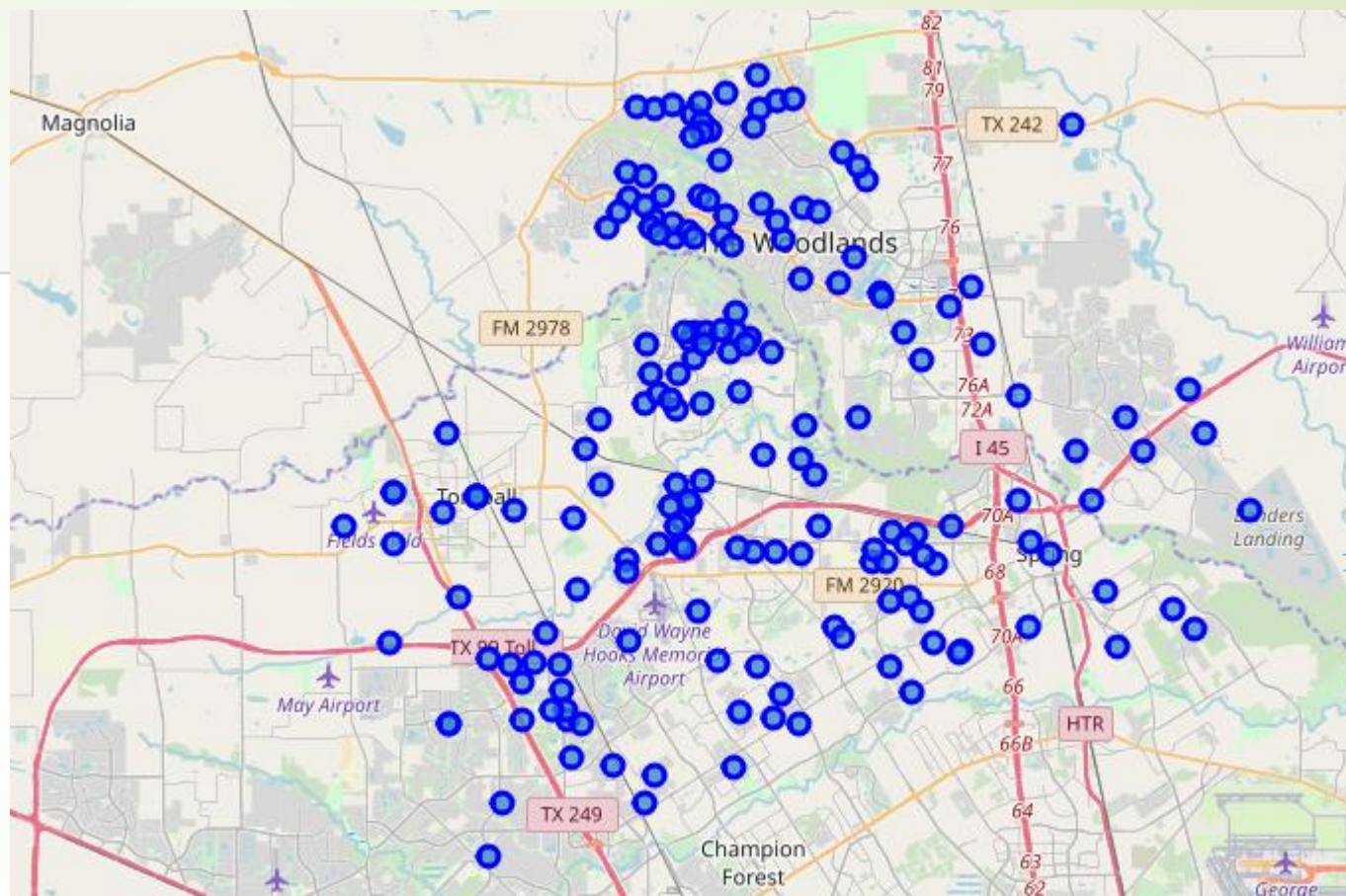
	Neighborhood	City
0	Acacia Park	Spring, TX
1	Albury Trails Estates	The Woodlands, TX
2	Alden Bridge	Spring, TX
3	Alden Bridge Hollylaurel	Spring, TX
4	Alden Trace	Spring, TX

Base list of neighborhoods

Out[5]:

	Neighborhood	City	Resolved Name	Latitude	Longitude
0	Acacia Park	Spring, TX	(Acacia Park, Alden Bridge, The Woodlands, Mon...	30.218422	-95.529759
1	Albury Trails Estates	The Woodlands, TX	(Albury Trails Estates, Harris County, Texas, ...	30.069389	-95.580927
2	Alden Bridge	Spring, TX	(Alden Bridge, The Woodlands, Montgomery Count...	30.213204	-95.517991
3	Alden Bridge Hollylaurel	Spring, TX	(Hollylaurel, Alden Bridge, The Woodlands, Mon...	30.223754	-95.518385
4	Alden Trace	Spring, TX	(Alden Trace, Alden Bridge, The Woodlands, Mon...	30.208315	-95.519652

Neighborhoods resolved to Geographical coordinates



Sample Data (contd)

Nearby School Data from
Foursquare Location API

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	School	School Latitude	School Longitude	School Category
0	Acacia Park	30.218422	-95.529759	Woodlands Civic Ballet	30.207763	-95.527541	School
1	Acacia Park	30.218422	-95.529759	Bush Elementary School	30.211384	-95.517843	School
2	Acacia Park	30.218422	-95.529759	Barbara Pierce Bush Elementary	30.211636	-95.517427	Elementary School
3	Acacia Park	30.218422	-95.529759	Kumon Math and Reading Center of The Woodlands...	30.208512	-95.529289	School
4	Acacia Park	30.218422	-95.529759	Legacy Preparatory Christian Academy	30.225233	-95.545745	High School

	School	gsRating	parentRating	city	state
0	Bush Elementary School	3	3	Houston	TX
1	Galatas Elementary	10	4	Spring	TX
2	Powell Elementary	9	3	Spring	TX
3	Tough Elementary School	10	4	The Woodlands	TX
4	The Woodlands Christian High School	NaN	5	The Woodlands	TX

School rating data from
[greatSchools.org](https://greatschools.org)