Finding the best community area in Chicago to live in

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1 Introduction/Business Problem

1.1 Background

Chicago is the most populous and popular city in Illinois. With an estimated population of 2,716,450 (2017), it is the third most populous city in the United States, the third-largest in the United States, and the fourth largest in North America. Chicago is an international hub for finance, culture, commerce, industry, technology, telecommunications, and transportation. Chicago has one of the highest GDP in the world, generating $ 680 billion in 2017. The city lies beside huge freshwater Lake Michigan, and two rivers— the Chicago River in downtown and the Calumet River in the industrial far South Side—flow entirely or partially through Chicago making it most beautiful place to live in.One of the main considerations of a move to Chicago is affordability.

1.2 Description of the problem

According to the details mentioned above , Chicago seems to be a great place to move in and to live. But the question is which community area or which community area neighbourhood we choose as the city is divided into 77 community areas and around 100 neighbourhoods. Factors that determine the best place for living include 'Housing Availability', 'Employment rate', 'House Holds below poverty line'. The goal of this project is to find the best community area and neighbourhoods to live in based on the factors mentioned above. The questions can be framed as :

1. What is the best community area to live in
2. How community areas are categorized according to crowded housing or unemployment rate etc. features?
3. Does correlation exist between these features selected?

1.3 Target Audience

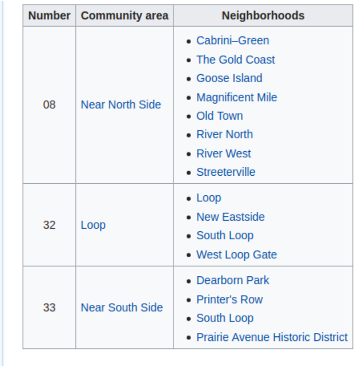
Students who want to pursue higher education as the universities here are ranked in top among the top universities is USA. The city is popular with college students because they can enjoy student life without worrying too much about covering the bills as cost of living is reasonable. Job aspirants who want to get into good jobs with high salalries and also the comfortable life in every means because chicago has steady job market.There are many big businesses here and plenty of work opportunities. It offers a vibrant city life without the hefty property price tags of New York or Los Angeles and the cost of living is lower here. This makes a very good reason to live in chicago with families as well.

2 Data Description

2.1 Data Acquisition

1. I scraped list of neighbour community areas and neighbourhoods from the page : `https://en.wikipedia.org/wiki/Community_areas_in_Chicago`

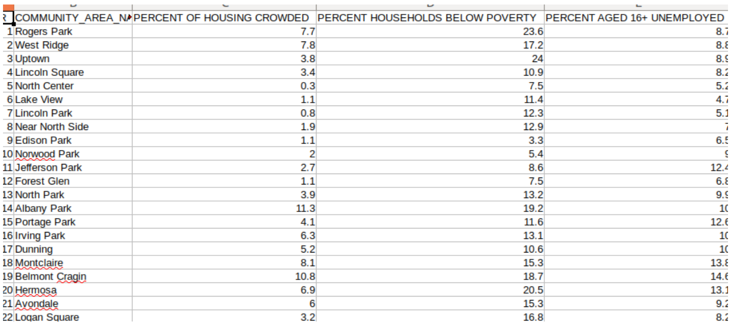
   Sample Screen Shot of List of Community Areas eighbourhoods :



Number	Community area	Neighborhoods
08	Near North Side	• Cabrini–Green • The Gold Coast • Goose Island • Magnificent Mile • Old Town • River North • River West • Streeterville
32	Loop	• Loop • New Eastside • South Loop • West Loop Gate
33	Near South Side	• Dearborn Park • Printer's Row • South Loop • Prairie Avenue Historic District

2. I have obtained the required census data regarding housing, unemploymnet etc. from the page : `https://ibm.box.com/shared/static/05c3415cbfbtfnr2fx4atenb2sd361ze.csv`

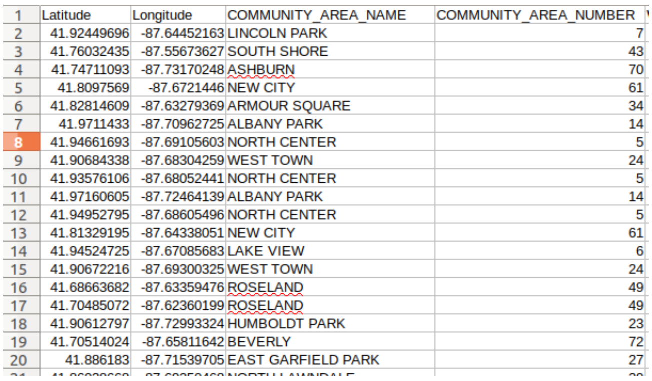
   Sample Screen Shot of Census Data :



R	COMMUNITY_AREA_NA	PERCENT OF HOUSING CROWDED	PERCENT HOUSEHOLDS BELOW POVERTY	PERCENT AGED 16+ UNEMPLOYED
1	Rogers Park	7.7	23.6	8.7
2	West Ridge	7.8	17.2	8.8
3	Uptown	3.8	24	8.9
4	Lincoln Square	3.4	10.9	8.2
5	North Center	0.3	7.5	5.2
6	Lake View	1.1	11.4	4.7
7	Lincoln Park	0.8	12.3	5.1
8	Near North Side	1.9	12.9	7
9	Edison Park	1.1	3.3	6.5
10	Norwood Park	2	5.4	9
11	Jefferson Park	2.7	8.6	12.4
12	Forest Glen	1.1	7.5	6.8
13	North Park	3.9	13.2	9.9
14	Albany Park	11.3	19.2	10
15	Portage Park	4.1	11.6	12.6
16	Irving Park	6.3	13.1	10
17	Dunning	5.2	10.6	10
18	Montclaire	8.1	15.3	13.8
19	Belmont Cragin	10.8	18.7	14.6
20	Hermosa	6.9	20.5	13.1
21	Avondale	6	15.3	9.2
22	Logan Square	3.2	16.8	8.2

3. I have extracted geo location data for every community area from the page : `https://ibm.box.com/shared/static/f9gjvj1gjmxxzycdhplzt01qtz0s7ew7.csv`

Sample Screen Shot of School Data :



1	Latitude	Longitude	COMMUNITY_AREA_NAME	COMMUNITY_AREA_NUMBER
2	41.92449696	-87.64452163	LINCOLN PARK	7
3	41.76032435	-87.55673627	SOUTH SHORE	43
4	41.74711093	-87.73170248	ASHBURN	70
5	41.8097569	-87.6721446	NEW CITY	61
6	41.82814609	-87.63279369	ARMOUR SQUARE	34
7	41.9711433	-87.70962725	ALBANY PARK	14
8	41.94661693	-87.69105603	NORTH CENTER	5
9	41.90684338	-87.68304259	WEST TOWN	24
10	41.93576106	-87.68052441	NORTH CENTER	5
11	41.97160605	-87.72464139	ALBANY PARK	14
12	41.94952795	-87.68605496	NORTH CENTER	5
13	41.81329195	-87.64338051	NEW CITY	61
14	41.94524725	-87.67085683	LAKE VIEW	6
15	41.90672216	-87.69300325	WEST TOWN	24
16	41.68663682	-87.63359476	ROSELAND	49
17	41.70485072	-87.62360199	ROSELAND	49
18	41.90612797	-87.72993324	HUMBOLDT PARK	23
19	41.70514024	-87.65811642	BEVERLY	72
20	41.886183	-87.71539705	EAST GARFIELD PARK	27

2.2 Data Cleaning

The data is extracted from the sources mentioned above and loaded into data frames for further processing.

1. Data extracted from the wikipedia has no problems. It is a structured tabular data with no null values and empty rows.

2. Data extracted from the ’Census Data Set’ is also a well structured tabular data with many features. I eliminated empty rows i.e null values for features as they cant be included in the calculations.

3. The above process is repeated for the ’School Data Set’ and prepared it for further processing.

4. Longitude and Latitude values of every community area in Chicago are extracted too from ’School Data set’.

Every data frame has same number of rows which is equal to the total number of unique community areas i.e 77, after the data pre-processing and data preparation. All the data frames are merged on a single column ’Community area’ as the aim of this project is to find the best community area, into a single data frame for better understanding of the relation among features and it is also very easy to apply clustering algorithm on a single data frame for the better visualization of clusters and features.

2.3 Feature Selection

Only certain features from the data frame are needed for the processing. Rest of the feautures are redundant for this project. Selecting the required features for the next data analysis is the crucial part. These features actually become ’the factors’ that affect our results and the main goal of the project.

Required Feature Selection

	Features Selected	Reasons for Selection
Neighbourhood Data Frame	Community Area Name, Neighbourhoods	Result feature
Census Data Frame	Crowded Housing, Households below poverty line, Unemployment Rate	To estimate the quality of living
School Data Frame	Type of Schools available	Education purpose
School data Frame	Longitude, Latitude	Geo location