SOCI 20253 Spatial Data Science

Chen Liang, MACSS 2021

(The point and choropleth maps are at the end.)

I. Data Sources & Variables

CMAP: Community Data Snapshots Raw Data, July 2020 Release

https://datahub.cmap.illinois.gov/dataset/community-data-snapshots-raw-data

COMM: Chicago Boundaries – Community Areas https://data.cityofchicago.org/Facilities-Geographic-Boundaries/Boundaries-Community-Areas-current-/cauq-8yn6

LIQUOR: 2015 Chicago Liquor Stores https://geodacenter.github.io/data-and-lab/liq_chicago/

II. Variables

Raw Data: Community IDs and Names; 2010 Population by Community; Liquor Store IDs

Calculated Data:

Aggregated number of liquor stores per community; Number of liquor stores per 1000 people

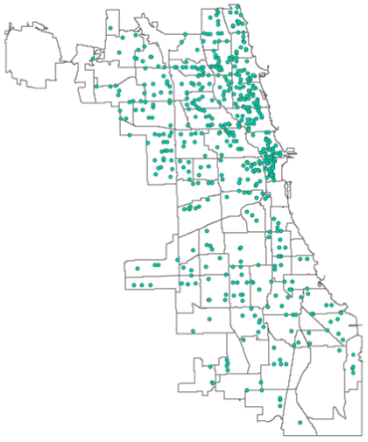
III. Operations

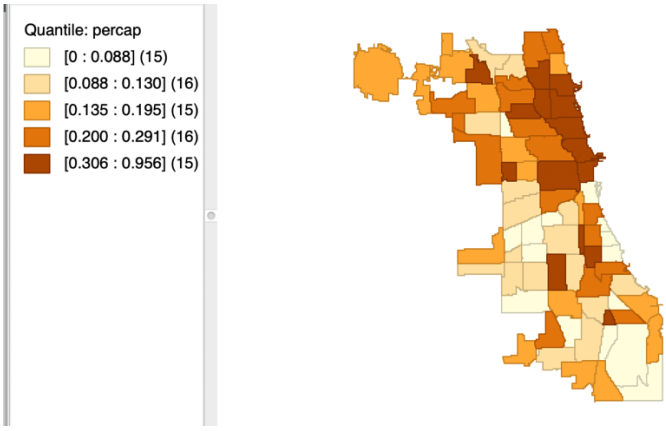
The operation is quite similar to the data processing process described in the workbook.

1. Projection: As mentioned in the workbook, the City of Chicago open data portal uses the Illinois State Plane (feet) projection system for its data, and I projected the maps with EPSG:3435.
2. Spatial Join:
    1) Import COMM as the first layer and LIQUOR as the second. (The point map is drawn with LIQUOR as the first layer.)
    2) Calculate Spatial Count (SC) using Tools -> Spatial Join, and save the data to commarea.dbf
3. Combine the Population Data :
    1) Extract only GEOG (community name) and 2010_POP from the CMAP data and add an enumerate ID for each community ordered by name.
    2) As specified by the workbook, change the “LOOP” in commarea.dbf to “THE LOOP”
    3) Sort the observations in commarea.dbf alphabetically by community area name, add an enumerate ID, and merge the population data with the enumerate ID as the key.
    4) Manually check whether the community names are matched in the resulting dataset.
4. Calculate Per Capita Data and Viualize
    1) Calculate the number of stores per capita, and per 1000 people, by the Bivariate function
    2) Visualize the number of stores per 1000 people with a Quantile Map with 5 categories.

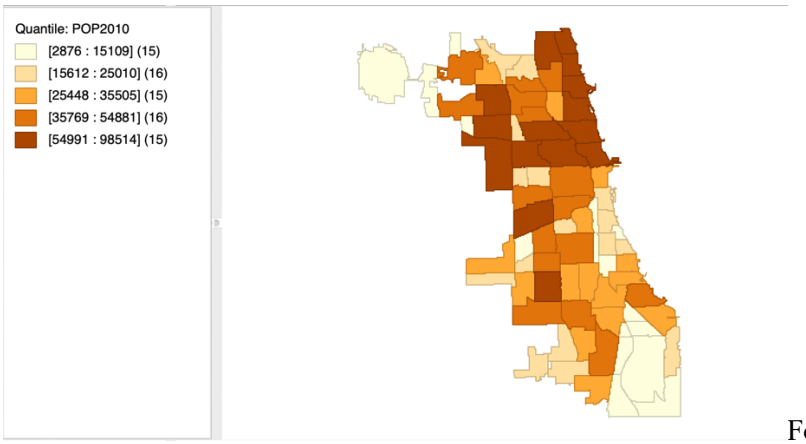
IV. Interpretation

1. Liquor stores, not suprisingly, favor populous communities. The number of stores per capita is the highest around the downtown area, where people have a higher consumption level and more social events that involve alchoholic beverages. Also, it is possible that people in the downtown area have higher rates of anxiety and depression and thus need alcohol as a way to release stress.
2. Hyde Park, Kenwood and Oakland, where many stressed college and graduate students reside, have surprisingly few liquor stores per capita. In fact, there are only two stores recorded in the three communities. I hypothesize that instead of visiting a liquor store, students would simply prefer to buy some cheap and common alcohol at their nearby grocery stores. Or it is simply that the porportion of students is too low compared to the whole population in the three communities, to effectively attract liquor stores to relocate in the neighborhoods.





Liquor Stores Per 1000 people



For reference, a 2010 population map