GEO 4342: GIS Concepts and Techniques

Python Project

Download the dataset Project_dataset.csv from canvas. The dataset has following columns.

GEOID10	Census Tract ID (10 digit)
County_Code	County that the tract belong to
Latitude	Latitude of the tract
Logitude	Longitude of the tract
Total_Pop	Total Population of the tract
Mean_Comm_Time	Mean commute time for workers over 16 years old in the tract
Frac_College	Number of people aged 25 or older who have a bachelor's degree, master's degree, professional school degree, or doctorate degree, divided by the total number of people aged 25 or older in a tract.
Med_HHincome	Median household income
Pop_Density	Number of residents per square mile, calculated by dividing the total tract population with tract land area given in square miles.
Frac_Living	Fractions of population living in poverty in the tract
Jobs_Total	Total Number of jobs in the tract.
Frac_Nonwhite	Fraction of non-white population
Underground	Number of Underground Tanks in the tract.
Fire_Station	Number of fire station in the tract
Hazardous	Number of hazardous sites in the tract.
Gas_Station	Number of Gas stations in the tract
Economic_Mob	Economic Mobility Index of the tract

Create a jupyter notebook to perform the below tasks.

Data Exploration and Cleaning

1. Number of columns and rows in the dataset?
2. If there is missing data in a column, replace the missing values with the Mean of that column

Querying a Dataset

1. What is the maximum and minimum value for fraction of residents living in poverty?
2. How many census tracts(rows) do not have any fire stations?
3. In how many census tracts (rows), median household income is more than the average?
4. What is the average of median house-hold income for the tracts (rows) where 80% or more people are non-white vs. 20% or less people are non-white?
5. Which census tracts (rows) has the highest and lowest population density? What are the fractions of people living under poverty in those census tracts?
6. Group the data by number of Hazardous sites. What are the average population densities for each group?

Finding Correlations

1. What is the correlation between Economic Mobility and fraction of residents living in poverty?

2. Plot the correlation between Economic Mobility and fraction of residents with a college degree.
3. Plot the correlation between Economic Mobility and fraction of residents living in poverty.

Data Visualization

1. Use the color map to visualize number of total jobs and the value of Economic mobility for NC geo tracts.
2. Use the color map to visualize the fraction of people living with poverty and the value of Economic mobility for NC geo tracts