APPLIED DATA SCIENCE

ASSIGNMENT_2

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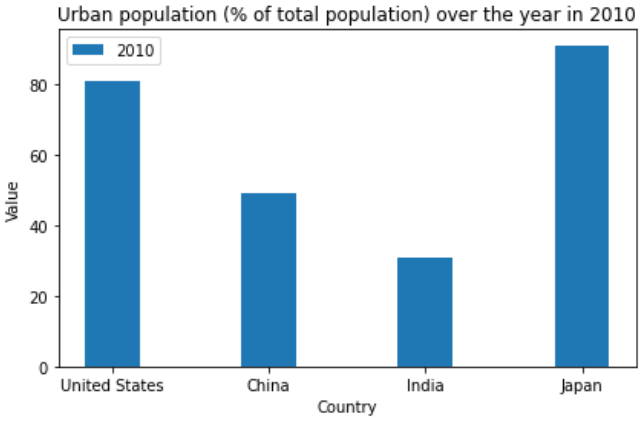
GITHUB LINK: https://github.com/RaniPanneru/ads-assignment2.git

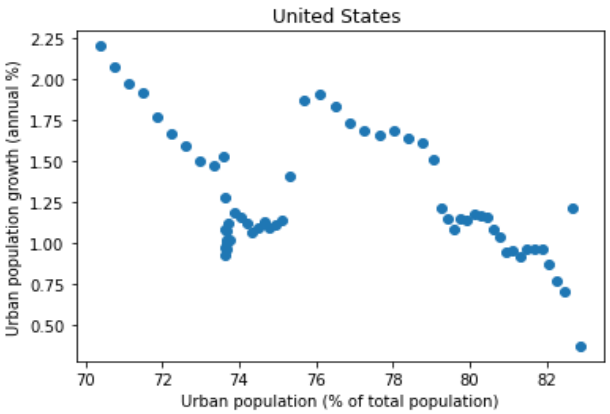
DATA ABSTRACT: Analyzing World Bank urban population data, this study explores key metrics in the United States, China, India, and Japan from 1960 onward. Visualizations highlight trends in urban growth, land area, and demographic distribution, offering succinct insights into global urbanization dynamics.

BAR GRAPH_1



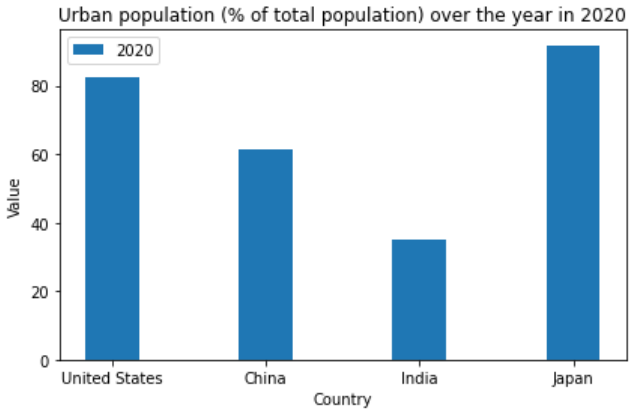
The 2020 urban population percentages underscore notable variations among the United States, China, India, and Japan. Japan and the United States stand out with high urbanization rates at 80%, while China and India exhibit lower rates of 50% and 38%, respectively. They mirror the diverse stages of development and cultural contexts shaping each nation's approach to urbanization

SCATTER PLOT_1



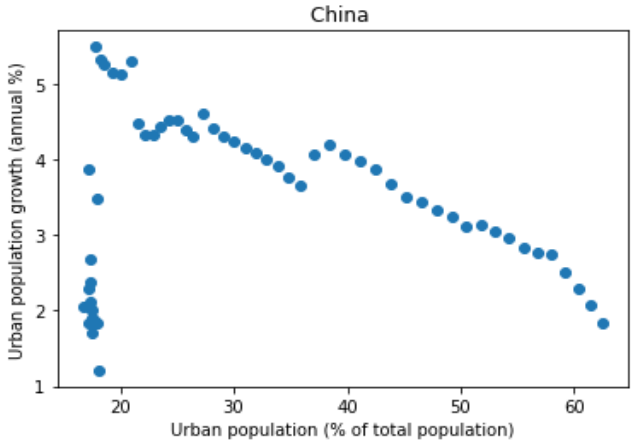
The scatter plot (1970-1982) for the United States reveals a negative correlation between urban population percentage and annual growth. As urbanization rises, natural increase and net migration decline, potentially due to factors like lower fertility rates or reduced urban attractiveness for migrants. Statistical measures like slope and correlation coefficient can provide insights into this relationship.

BAR GRAPH_2



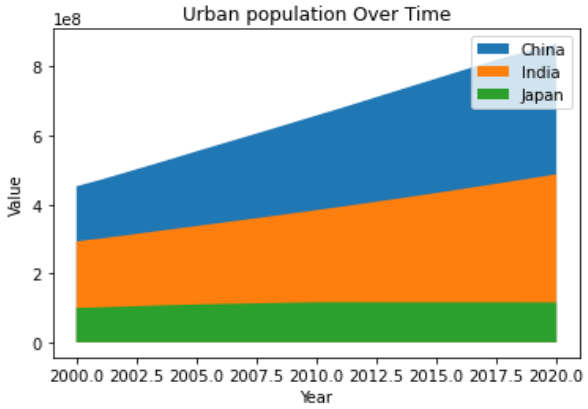
The 2020 urban population percentages highlight distinct patterns among the United States, China, India, and Japan. Japan leads with 80%, closely followed by the United States is more than 80%. In contrast, China and India have lower urbanization rates at 60% and 30%, respectively. These disparities suggest nuanced relationships with economic development, social structures, and environmental factors, reflecting the diverse stages of development and cultural contexts across these nations.

SCATTER PLOT_2



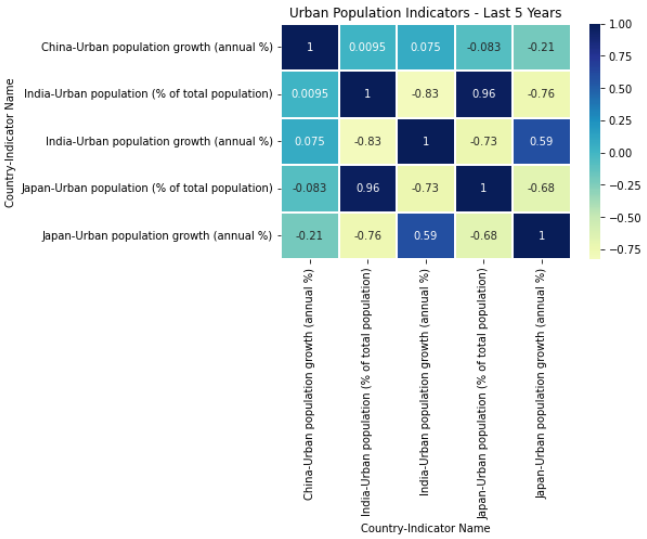
The scatter plot for India examines the connection between "Urban Population (% of Total Population)" and "Urban Population Growth (Annual %)." It visually analyses the relationship, revealing trends and patterns in the growth rates concerning urban population percentages over various years. The scatter plot aids in identifying associations and patterns, offering a concise visual analysis.

AREA PLOT



The stacked area chart illustrates urban population trends in China, India, and Japan over time. China leads, followed by India and Japan, with both China and India experiencing more significant growth. China surpassed Japan around 2000 and India around 2010. Japan's urban growth slowed after 2000, while China's and India's accelerated, widening the gap between their urban populations to over 300 million in 2020.

HEAT MAP

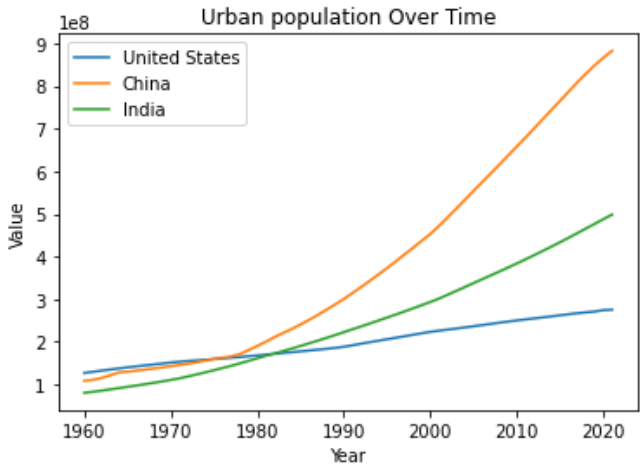


The distribution of urban population indicators for a few chosen countries is displayed in the heatmaps. The above heatmap shows the percentage of the overall population that is urban, as well as the annual percentage growth in urban population for the United States, China, India, and Japan. Under the same countries, the second heatmap shows the 'Urban land area where elevation is below 5 meters (sq. km)' and 'Population in urban agglomerations of more than 1 million (% of total population)'. One can quickly compare indications between different countries by using darker hues, which correlate to greater values in the relevant cells.

PIVOT CHART

The pivot chart illustrates the urban population growth percentages in the United States, China, and India over time. The U.S. demonstrates stable growth (1.2-1.8%), indicating a mature urbanization stage. Post-2000, China and India experience notable increases, with China surpassing the U.S. at 3.4% in 2010 due to rapid urbanization driven by economic growth. India's growth, though increasing, lags behind China, suggesting challenges in its urbanization process, including infrastructure limitations and social and environmental issues.

LINE PLOT



The graph tracks urban population trends from 1960 to 2020 for the United States, China, and India. China surpassed the U.S. in 1980 and India in 1990, while India caught up to the U.S. by 2010. The U.S. saw slow, steady growth, reaching about 2.5 in 2020. In contrast, China and India experienced rapid urbanization, reaching around 8.5 and 5, respectively, highlighting their faster and more extensive urban development over the past six decades.