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Slums in the Big City

We were assigned the **25 Most Populated Cities in India** dataset. We combined it with the **Census data on slum populations** to see if we could identify any trends between Population Growth and Slum Populations in India's Largest Cities. We opted to focus only on the 10 largest cities in India.

Process

Data Collection and Processing

We discovered that slum populations were recorded for the first time during the 2001 Census. This was only done for India's largest cities, with data being recorded at the state level for all cities with a population greater than 1 million. While the 2001 numbers are officially available on the **http://censusindia.gov.in**, often the site is inaccessible. So we had to manually collect the numbers by referring to a snapshot of the page on **Wayback Machine**

We stored the data in an Excel file and additionally made a CSV file with all the relevant columns for 2001 & 2011 data.

Mapbox

With regard to mapbox, we experimented with number of styles. Our original idea was to layer the data year wise and incorporate filters to add / remove the data on the basis of 2001 or 2011 data. However, we weren't able to figure out the MapBox GL javascript library. As a result, we opted to represent the population of the top 10 cities as circles.

The 2001 data is represented as a blue circle while the 2011 data is a violet circle. These have been placed so as to spread concentric when viewed from a low zoom level. This enables one to gauge 2 things:

- How large the populations are across various cities
- How much the population of the city has grown between 2001 and 2011.

Front-end and JavaScript

Again, we tried out a number of possible options with our front end. In the end, we opted for a 3 panel layout. The first panel houses the MapBox map which we use to pan to the cities being spoken about.

The second panel is an interactive graph that we built using Google Charts. We use this to give a quick overview about the total population across the cities being studied while providing exact numbers.

Finally, the last panel is the scroll bar. We use this section to pan and zoom to each individual city being discussed. Additionally, for each city, we have a graph that depicts its total population & slum population growth rates between 2001 & 2011. While the panel has a thumbnail, that itself is clickable which opens the graph in full screen.

Overall, we wanted to add a few more layers of interactivity, but were unable to figure out the necessary JavaScript modifications to make it work well the the MapBox library.

Insights

It would be reasonable to assume that populations of cities will increase in a decade, which is what we see in all cities here except **Kolkata**. The declining population in Kolkata left '**experts puzzled**', but migration out of the city and low fertility rate have been cited as two possible reasons for this.

The growth rate of slums, however, does not show a consistent trend across cities. While cities like **Bangalore**, **Hyderabad**, and **Surat** show an increase in slum population, others such as **Mumbai**, **Delhi**, and **Ahmedabad** experienced a fall in slum population, with the slum growth rate in Ahmedabad as low as -43%.

Between 2001 and 2011, several slum rehabilitation projects were operating in the cities we are studying, most noteworthy of them being the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), and the Rajiv Awas Yojana (now the Pradhan Mantri Awas Yojana). The projects aim to help reduce the number of slum dwellers in Urban centres. But the execution of these projects appears to have been somewhat flawed.

Hyderabad saw a 280% increase in slum population despite being under the JNNURM. Buildings were constructed, but **occupancy was abysmal** due to **lack of water and electric supply, and cracked walls**. People did not move into these houses even though they had paid for them, and instead, moved into slums in other areas.

On the other hand, **Ahmedabad** appears to have benefited immensely from the Rajiv Awas Yojana. The scheme began in 2009 but slum-dwellers were offered housing as early as 2010. Prior experience with slum development NGOs like **Mahila Housing SEWA Trust** had prepared women in slums to deal with authorities and housing policies. An added incentive was that the residents would have co-operative ownership of their building.

An ambitious project to improve the conditions of slums in **Dharavi, Mumbai**, was announced in 2004, but remained stagnant for almost 10 years due to a deadlock between interest groups. Corporations placed bids but withdrew them when they sensed apprehension from the slum-dwellers. Some sectors that did get assigned saw negligible development.

While we can mostly speculate about possible reasons for the noticed population and slum growth rates, we are able to discern noticeable trends by visualising the data. The truly interesting facet is the fact that different cities exhibit different variations. This posits that a deeper study into housing policies in these locations could yield interesting results.