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CS 448B: Data Visualization

## Final Project Proposal

I plan to build a data analysis / explainer project surrounding cities and their respective climate risks. As the effects of climate change continue to increase, the severity and frequency of natural disasters will only increase around the world. This will impact our world in significant ways, from higher potential of damage to homes and businesses, increases in food prices due to crop failures, and greater exacerbation of income inequality as those with resources can pay for climate adaptation while those without will suffer the consequences of climate change. In fact, models have shown for every degree increase in average temperature, roughly a billion people will be displaced, which will create one of the largest mass migrations in human history. Each city will have to adapt to climate change, although some locations may benefit due to new temperatures and climates more suitable for humans. However, not all cities will adapt equally as the impact to them will be different. Adaptations will come in different ways, from building levees and flood barriers to reducing forest cover and dry shrubbery to reduce the impact of wildfires. To illustrate the different impacts climate change will have, I want to build out a data analysis / explainer of the different climate risks on a city level. There have been some climate risk maps that have been built, but these have mostly been on a macro level or are done so using proprietary data (such as First Street Foundation's climate maps). However, there hasn't been one that's been built out on a city level, such as the data provided by CDP (<https://data.cdp.net/>). This data has been visualized (e.g. <https://data.cdp.net/Climate-Hazards/2022-Cities-Climate-Hazards-by-Magnitude-of-Impact/s8kx-ja49>) but not as extensively and geographically focused.

I believe there is an opportunity to break down climate risk by cities, especially since the vast majority of humans live in cities and where climate adaptation can have the biggest impact. Geographically, this will also be helpful to visualize which cities will be facing significant climate risks, along with what cities that are nearby geographically may be facing lesser risks (thus potentially meaning climate migration may occur). I plan to build out mostly geographical maps as visualizations, with three separate breakdowns

(one by type of hazard faced, one by severity / impact on population, and one by trends). Each of these will help tell a story of which cities will be facing what hazards, how impactful such hazards will be, and whether these hazards will increase or decrease with the impacts of climate change in the future. I also plan to add interactivity by allowing the user to choose which filters to include and which ones to remove for each of these breakdowns. For example, the user can choose to focus on all hazards and then compare it to only cities with fire weather hazards, or zoom in to a specific geographical area of focus. Overall, my hope is to build out a data explainer that can tell a story about climate risk hazards by city and how it differs from city to city both temporally, geographically, and in significance.