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STMATH 493
Visualization 4 : Five Years of American Opportunity

Description:
The U.S. Department of Labor issues certification which allows an employer to hire a foreign worker under permanent visa status. Before the employer may submit an immigration petition to the Department of Homeland Security U.S. Citizenship and Immigrations Services, the employer must obtain a certified labor certification application from the DOL Employment and Training Administration. The DOL must certify to the USCIS that there are not sufficient local workers able, willing, qualified, and available to accept the job opportunity in the area of intended employment and that the employment of the foreign worker will not adversely affect the wages and working conditions of similarly employed U.S. Citizens. The dataset includes permanent visa application decisions from 2012 to 2017.

Data Source:
https://www.kaggle.com/jboysen/us-perm-visas

Question:
For which industries, and from which countries are the most permanent visa applications received?

Educational Impact & Motivation:
I feel that this visualization was a great exercise in data preprocessing and management of a larger, messy dataset. I personally focused on keeping the visualizations simple, which provided a great opportunity for learning. The visualization is informative, providing a detailed insight into the dataset, and iteratively progresses through an explanation of this data. The use of technology allows for the dynamic views which change based on year selection or economic sector, but lacks the discussion that is useful when using a storyboard. It is intended to engage the viewer, and provide an overview of a highly contentious topic.

Analysis:
Our group analyzed a public dataset of U.S. Permanent Visa data from 2012 to 2017. When looking at Number of Cases over time, a generally increasing trend is observed, which implies there are more Permanent Visa Applications every year. When viewing the Distribution of Permanent Visa Applications, it can be observed that a majority of all visa applications are for temporary work in I.T., where 82.23% of all applications are for H-1B visas, and 74.8% of these are for work in Information Technology. While the process is relatively stringent, 88.24% of these H-1B visas are Certified, while nearly half are expired. This is a trend that is constant across all years. Across all Economic Sectors, and across all years, India is a majority of all H-1B applications, averaging 64.48%. In the United States, urban centers have the highest density of H-1B workers, with Academia & Science favoring the Midwest and East Coast, Finance and Law are most popular in New York, Healthcare has a similar clustering to that of Academia & Science, while Industrial and Retail are most grouped in the Southeast. I.T. and Management are most clustered in Seattle, Southern California, Central Texas, Chicago, and New York. Religion is most clustered in Los Angeles. This storyboard of visualizations guides the viewer through a large collection of information and helps them draw conclusions about the current state of a highly contentious topic. Future analysis could include extension onto a more accurate dataset, and comparison with data from historical data against the job market; the visualization allows the viewer to answer the question simply and from many angles.