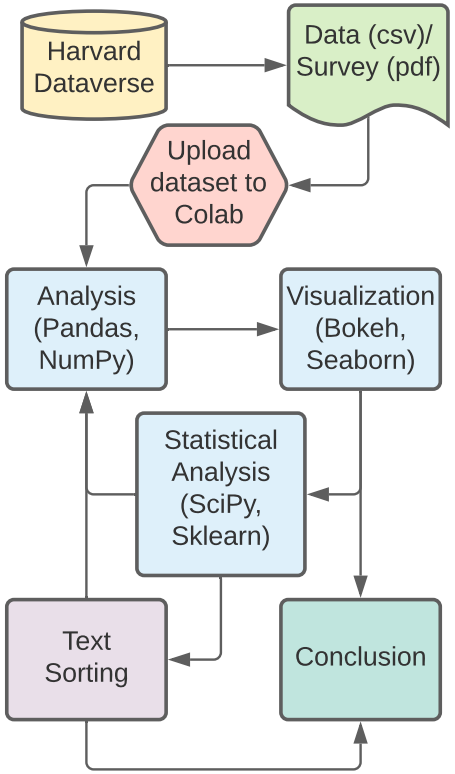
Americans on Climate Change: Storyboard

DIGHUM 100 Theory and Methods | Instructor: Dr. Adam Anderson | Vivian Kim | 7/1/2021

Introduction:



What contributes to a person's environmentally-*unfriendliness*?
How can we effectively have people participate in green activities?

Dataset: https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/8Z7M4G
GitHub: https://github.com/vivianskim20/climate-change
Google Drive: https://drive.google.com/drive/folders/1S5Ys2fv0L0xWvG6Gx8jBeZYuqU6_a8sj?usp=sharing
Colab: https://colab.research.google.com/drive/1Y31yjvjINxSN529JSBmEVg1eJHyNXINE?usp=sharing
Work Cited: https://docs.google.com/document/d/18RYDupY85u2QFk4D2WWi4QEsf25abF1nfiJvKeqmY70/edit?usp=sharing

Descriptions:

The dataset is obtained from Harvard Dataverse and contains results of a survey from the US respondents' regarding to their beliefs, emotions, and intentions behind environmental issues. They were asked to answer in numbers between 1 to 7 (1 = *unaware/apathetic*, 7 = *aware*), and the average sentiment scores were evaluated. Demographics and a short free-response in response to guessing what the purpose of the survey are also given.

The questions I focused on are:
1) How do gender, age, and political view affect Americans to feel about climate change/protecting the environment?
2) What are some of the popular and unpopular green activities and existing/future green policies?
3) Are those who responded "unsure" to the free-response question any different from who didn't in terms of their average sentiment score?

I used Pandas and NumPy to load and extract the dataset in Google Colab using Python. For visualization, I used Bokeh and Seaborn, and for statistical analysis, I utilized SciPy and Scikit-Learn. I grouped the dataset by gender and conducted a *2-sample T-test* to compare the differences in their means is statistically significant. I did a *regression analysis* on age to see the linear correlation. I proceeded with *Kruskal-Wallis* and *Dunn's test* for the political groups which are similar to 2-sample T-test but with medians instead. The last graph is a heatmap for pairwise correlation comparisons for the three variables to the average sentiment score.

I sorted the intended green actions and policies in a descending order (1 = *yes/support*, 2 = *no/unsupport*) to find a pattern in what's popular and unpopular.

I also manually sorted the responses to asking the purpose of the survey and conducted a 2-sample T-test of average sentiment scores in attempt to find any major differences in the "unsure" and "sure" groups.

Interpretations:

The first graph shows the average scores by gender and the 2-sample T-test returned their differences are **statistically insignificant**. The average scores are plotted by age in the second graph and it shows a very **weak** correlation (0.0012).

Th box plots show distributions by political groups, ranging from 1 to 7 (1 = *strongly liberal*, 4 = *neutral*, 7 = *strongly conservative*). The results of the tests show that the largest, **highly statistically significant** median differences are found in groups: 1 and 7, 2 and 7, 3 and 7, 1 and 6, and 1 and 4. Out of the three variables (gender, age, political preference), political preference and the average score had the highest correlation (moderately correlated).

The top two most popular intended green activities are waiting for a full load to use a washing machine and recycling, whereas the top two most unpopular activities are hang-dry instead of using a dryer and driving less/not at all. Similarly, the top two most supported policies are a rebate for reusable bags and tax credits for hybrid cars while the top two most unsupported policies are a commuter tax for driving alone during rush hour and a fee for driving a fuel-inefficient car.

About 5% of the respondents were "unsure" of the purpose of the survey, yet their average score and the average score of the rest are **not** found to be much different according to a 2-sample T-test.

Conclusions:

Out of the three variables studied here, one's political preference, surprisingly has the largest correlation with the average sentiment score. Some of the unpopular energy-conserving activities, such as opting out of using a dryer, are not promoted as widely as the popular ones. People naturally prefer to get rewarded than punished and it shows in their support for certain policies. Respondents who were unsure of the purpose of the survey are, fortunately, not much more of a threat than the rest who guessed something.

Further research can be conducted to see if other variables play an important role in a person's environmentally-unfriendliness, such as income, education, etc. In the future, green policies and activities can use the suggested logic to have more people participate.

Work Cited: https://docs.google.com/document/d/18RYDupY85u2QFk4D2WWi4QEsf25abF1nfiJvKeqmY70/edit?usp=sharing