



REPUBLICANS, DEMOCRATS, AND CLIMATE CHANGE OPINIONS IN THE UNITED STATES

INTRODUCTION

This decade there has been an increasing divide in the United States between its two dominant political parties: republicans and democrats. According to The Seattle Times, “**Partisan identification is now a bigger wedge between Americans than race, gender, religion or level of education**”. This comes at a time many climate scientists view enacting government policies as a necessary solution to prevent irreversible harm to Earth’s ecosystems. However, climate change is a very divisive issue between republicans and democrats in a political system only increasing in polarity. This begs the question: is there common ground regarding climate change that can be reached between the two parties?

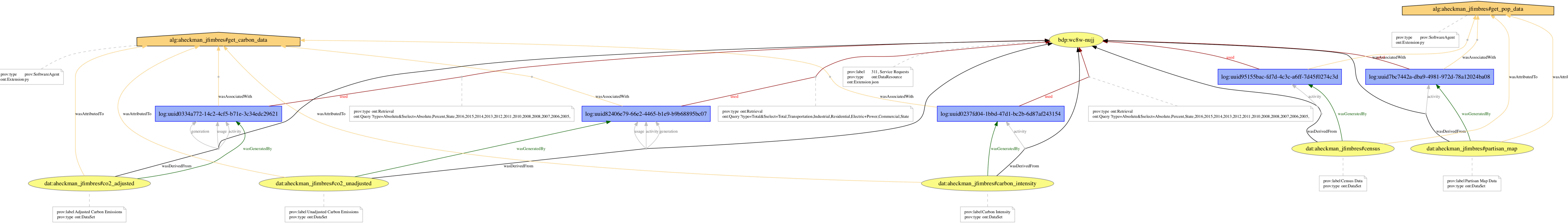
PROJECT GOALS

- The underlying purpose of the project is two-fold:
- 1) Determine the degree of difference between republicans and democrats in each state on select opinions relating to climate change to determine which ones **maximize** common ground between the two parties (e.g. Is congress doing enough with regards to climate change?).
 - 2) Find the **correlation** between carbon efficacy and CO₂ emissions per capita to determine if an increase in how efficiently carbon is used by a state decreases it’s emissions per capita and if so by how much.

DATA + PROVENANCE

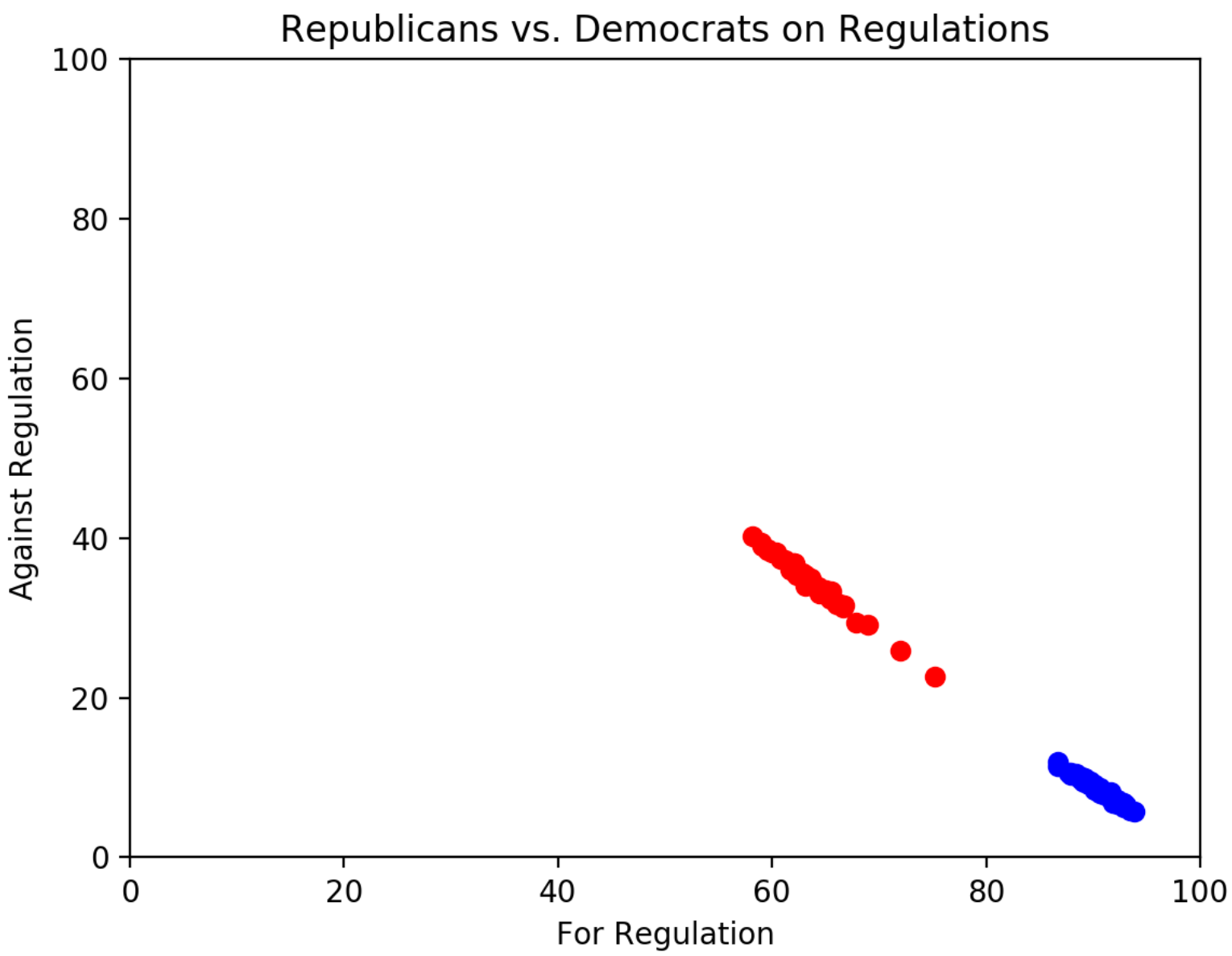
- i. United States Partisan Map Data
- ii. United States Population/State Data
- iii. State Energy-Related CO₂ Emissions Adjusted
- iv. State Energy-Related CO₂ Emissions Unadjusted
- v. Carbon Intensity Per State

As our final data provenance diagram is very complex, below is the **Data Provenance Diagram for the First Step in Retrieving Our Data** for the sake of readability.

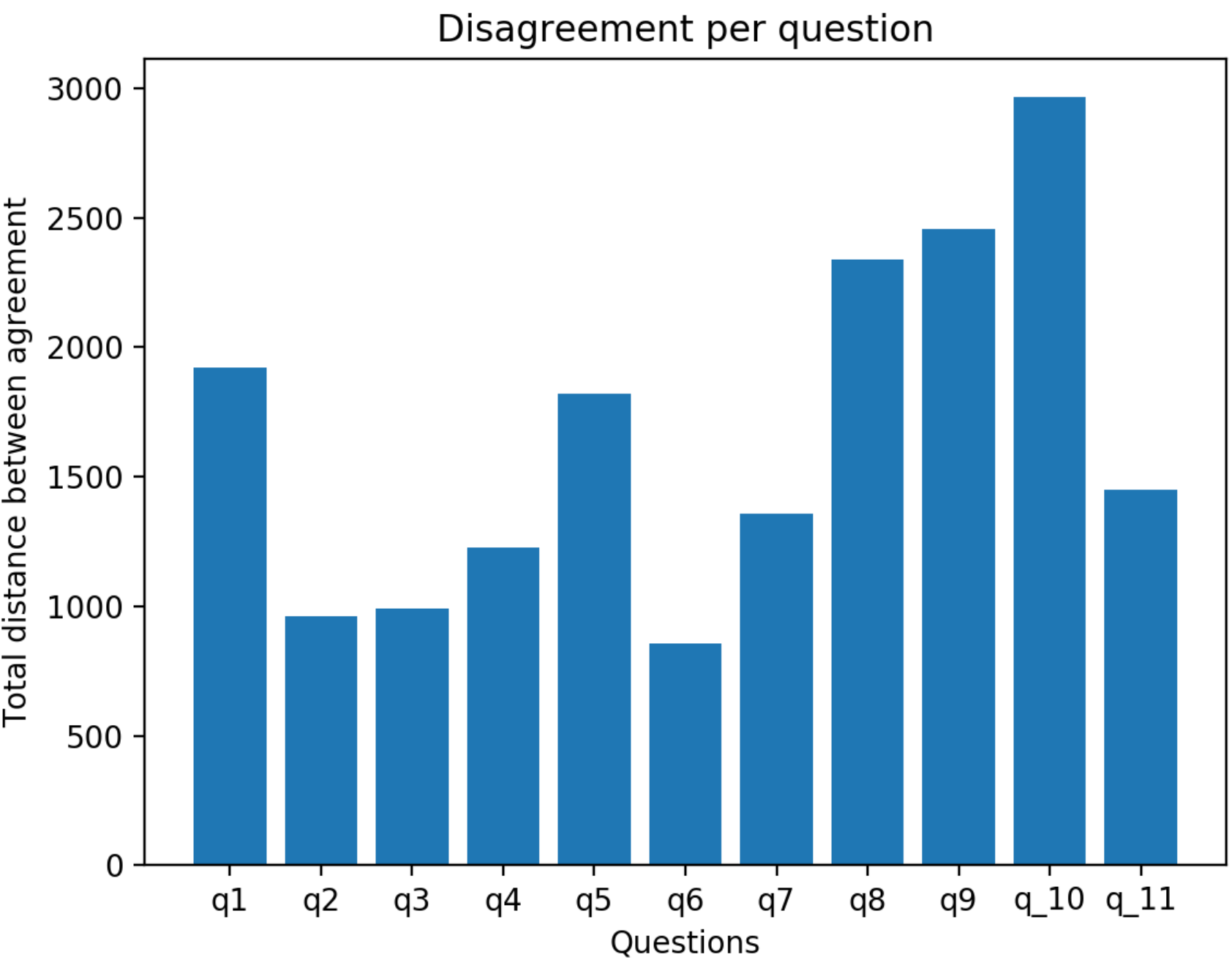


METHOD 1: OPTIMIZATION WITH K-MEANS ALGORITHM

PART 1:
With regards to each opinion: for each state’s democrats and republicans, we mapped their respective opinion on **the scatterplot to the right, with the x-axis representing % of people for regulation and the y-axis representing % of people against regulation**. Since these values will usually be around 100 – the other value, you can see the scatterplot is very linear. The example given to the right is for **Question 4, with red representing republicans and blue democrats**.



PART 2:
Next we use the k-means algorithm to determine the disagreement between the two parties. Since we know republicans and democrats are polarized, with some certainty we are guaranteed for at k=2 one k to represent republicans and the other democrats. From here we find the distance between these two points for each opinion and **graph them on the disagreement per question bar graph to the right in order to visualize the level of agreement between different questions**.

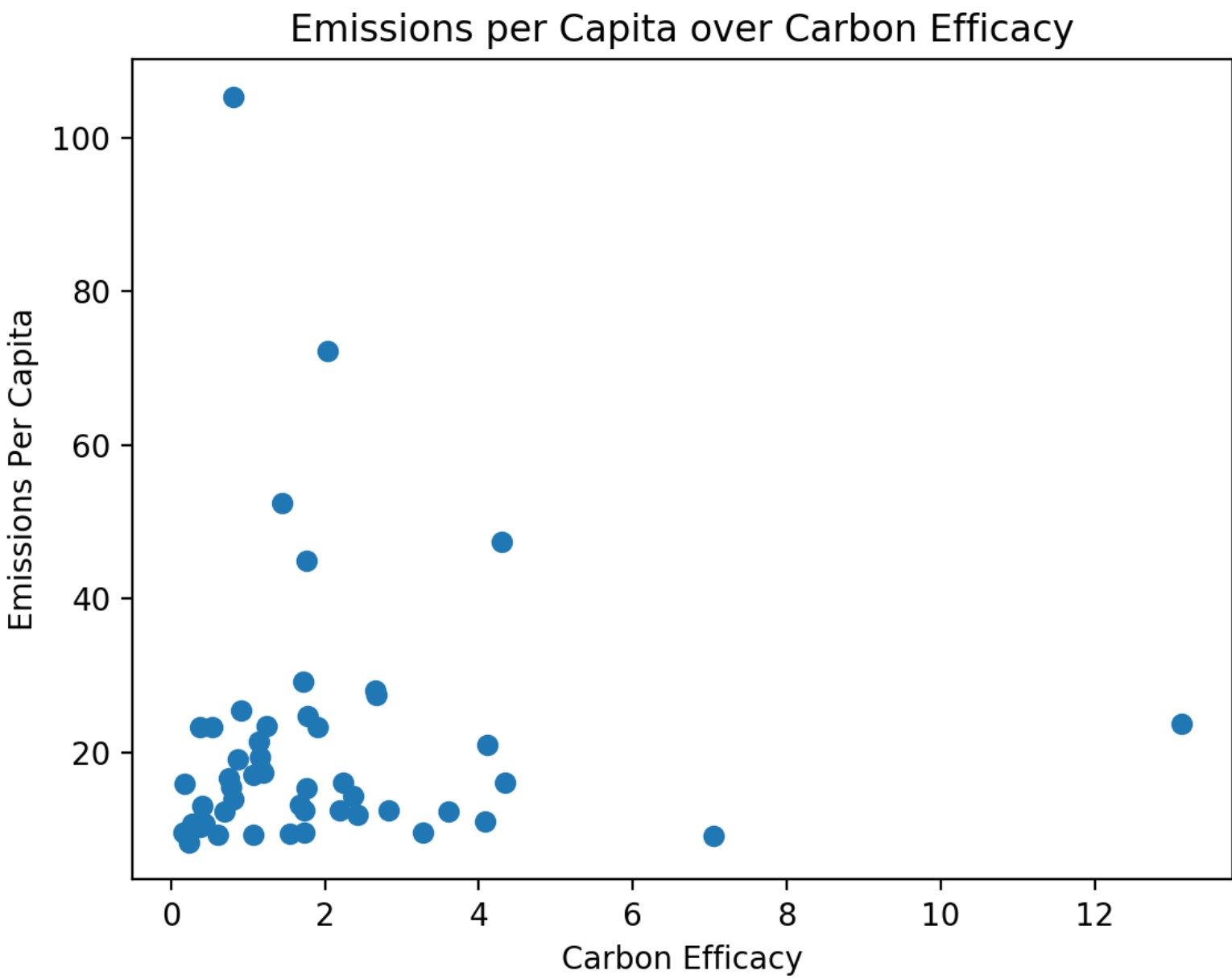


PART 3:
We can use the function **min(distance between disagreement)** to determine the opinion with the least disagreement.

- QUESTIONS:
- q1: Congress should do more to address GW | q2: Corporations should do more to address GW
 - q3: Citizens should do more to address GW | q4: CO₂ should be regulated as a pollutant
 - q5: Personally experienced effects of GW | q6: Worth protecting the environment at the cost of economic growth
 - q7: GW is happening | q8: GW is caused mostly by human activities
 - q9: Most scientists think GW is happening | q_10: Worried about GW
 - q_11: GW will harm the US

METHOD 2: DETERMINING RELATIONSHIP THROUGH THE CORRELATION COEFFICIENT

PART 1:
Using our census and carbon emissions data we calculate the emission per capita per state. Next we decided on this formula to represent carbon efficacy: average of Adjusted and Unadjusted CO₂ Emissions / Carbon Intensity. **We then graphed the results found for each state on the scatterplot below.**



PART 2:
Next we used SciPy to calculate the correlation coefficient and p-value of the data which are displayed below.

correlation coefficient = -0.06883669741109567
p-value = 0.634785689799831

CONCLUSION & FUTURE WORK

From the bar graph for disagreement per question we can see that the question with the least amount of disagreement is q6: **It’s worth protecting the environment at the cost of economic growth**. If we were to analyze this data even more, and perhaps given more climate change opinions to work with, we could attempt to find similarities between various opinions and their level of agreement between the two parties.

Interestingly we found **no relationship between carbon efficacy and carbon emissions per capita**. This rejects our hypothesis and seems counterintuitive and given more time we would explore the reason for this lack of relationship.