Natural Language Processing
Project Phase 1

Human Values Behind Arguments

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1 Introduction

This is a classification task based on SemEval 2023 Task 4. Its objective is to identify human values behind arguments.
To be more clear, given a text and some value categories, here we want to identify which category it falls in and also is it against or in favor of that category. You can access the project codes from here, and also all the data has uploaded to hugging face accessible via this link.

2 Dataset

Initially there was a dataset of 5393 annotated arguments. There was 20 values which i chose only 3 of them:

- Achievement
- Power: dominance
- Power: resources

After extracting the values which we want to classify, there remains 2188 arguments.

2.1 Data Collection

Using requests in python, I gathered needed data from the dataset provided.

2.2 Data Structure

The annotated corpus in tab-separated value format. Contains the following files for the different dataset splits:

arguments-<split>.tsv: Each row corresponds to one argument

- Argument ID: The unique identifier for the argument
- Conclusion: Conclusion text of the argument
- Stance: Stance of the Premise towards the Conclusion; one of "in favor of", "against"
- Premise: Premise text of the argument

labels-<split>.tsv: Each row corresponds to one argument

- Argument ID: The unique identifier for the argument

- Other: Each other column corresponds to one value category, with a 1 meaning that the argument resorts to the value category and a 0 that not

2.3 Data Filtering

In this state, I joined the arguments and labels by the Argument ID. I deleted all columns and rows which were related to other values.
For each of the remaining values, there is two labels: 'against' and 'in favor of' which I showed by adding 'N' or 'P' at the end of the value name.

2.4 Data Cleaning

For cleaning data, I removed all punctuation marks except dot. The reason for that is it makes the sentence and word tokenizing easier.

2.5 Data Breaking

After cleaning the data, I broke data by its sentence. You can find the label separated files inside data/sentencebroken directory. I also broke data by its words which you can find the label separated files inside data/wordbroken directory.

3 Statistics

These are some basics statistics about the dataset.

3.1 Row Count

Number of rows for each label.

row count
Against Achievement 729
In favor of Achievement 783
Against Power: dominance 310
In favor of Power: dominance 300
Against Power: resources 319
In favor of Power: resources 306

3.2 Sentence Count

Number of sentence for each label.

sentence count
Against Achievement 970
In favor of Achievement 1222
Against Power: dominance 426
In favor of Power: dominance 497
Against Power: resources 412
In favor of Power: resources 433

3.3 Word Count

Number of words for each label.

word count
Against Achievement 15397
In favor of Achievement 19222
Against Power: dominance 6622
In favor of Power: dominance 7793
Against Power: resources 6773
In favor of Power: resources 7045

3.4 Unique Word Count

Number of unique words for each label.

unique word count
Against Achievement 2782
In favor of Achievement 3465
Against Power: dominance 1642
In favor of Power: dominance 2066
Against Power: resources 1535
In favor of Power: resources 1730

3.5 Common Unique Word Count

Number of common unique words for each label.
Extra explanation: I computed the common words between all labels, then count the number of unique words for each label which are present in common words.

common unique word count
Against Achievement 416
In favor of Achievement 416
Against Power: dominance 416
In favor of Power: dominance 416
Against Power: resources 416
In favor of Power: resources 416

3.6 Uncommon Unique Word Count

Number of uncommon unique words for each label.
Extra explanation: I computed the common words between all labels, then count the number of unique words for each label which are not present in common words.

uncommon unique word count
Against Achievement 2366
In favor of Achievement 3049
Against Power: dominance 1226
In favor of Power: dominance 1650
Against Power: resources 1119
In favor of Power: resources 1314

3.7 10 Most Frequent Uncommon Words

10 most frequent uncommon words for each label.
Extra explanation: I computed the common words between all labels, then count the number of unique words occurrences for each label which are not present in common words, and sort them by number of occurrences to get the 10 most frequent uncommon words.

word 1 word 2 word 3 word 4 word 5 word 6 word 7 word 8 word 9 word 10
Against Achievement telemarketing cloning farming jobs food cars factory child actors autonomous
In favor of Achievement students wikipedia loans stem exploration cell embryonic young learn cars
Against Power: dominance company vote deterrent democracy killing judicial voting activism war threat
In favor of Power: dominance voting compulsory policy army democracy I political vote multi-party party
Against Power: resources jobs company telemarketing exploration food farming factory whaling executives businesses
In favor of Power: resources debt games prostitution expensive resources olympic unfair loans trade students

3.8 Words Histogram

In this words histogram, you see 30 of the most frequent words in all labels.

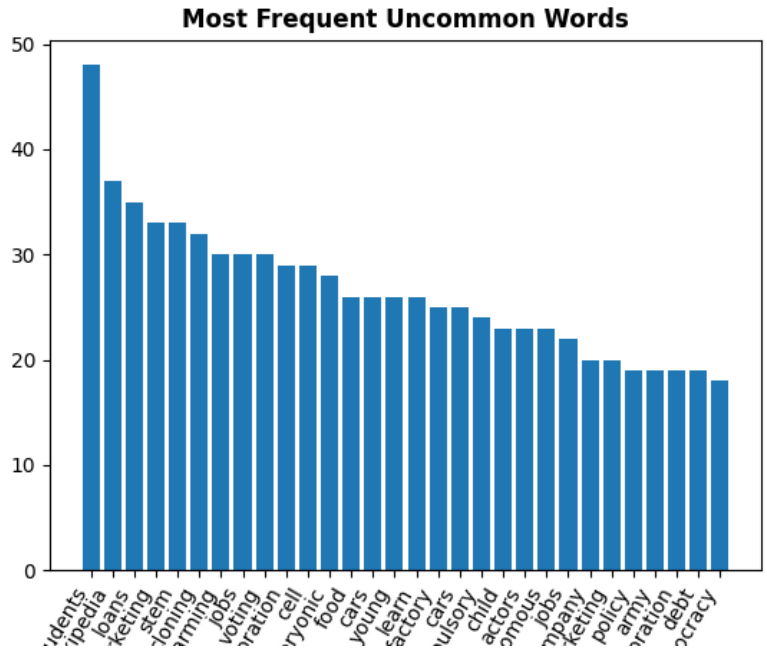

Figure 1: Most Frequent Words

4 Run Script

I wrote a python script which allows any user to run each part of this project separately.