

# DSI Project 3: Reddit Classification



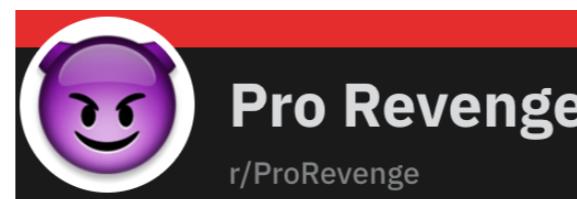
# Setting the stage



This looks photoshopped

# Problem statement

- Gauging maliciousness via language
- Compare 2 subreddits



# Problem statement

Use scraped data from both these subreddits to build a model that would determine if a post was less ([r/pettyrevenge](#)) or more ([r/provenge](#)) malicious

Do a simple analysis of any significant words found

Model must have an accuracy of over 70%

# r/pettyrevenge

 Petty Revenge [Join](#)

r/pettyrevenge

 Create Post

 Hot  New  Top  This Month  ... 

 21.0k  Posted by u/Anotherminion1 1 month ago   3  2  3 & 11 More

## Landlord "Always" Keeps Security Deposits? Game On!

Please be gentle, it's my first story.

Many moons ago, after my divorce, I saved up enough money to move from my apartment (a building with 12 units) and buy a house. I was really excited and told my favorite neighbor. He told me not to even bother trying to get my security deposit back because the landlord never returned security deposits.

I turned in my notice. The landlord didn't bother to do a final walk through. After 30 days, I emailed her and asked about my deposit. No response. I filed a small claim court case for the deposit.

This lovely lady's strategy was to hire a lawyer and bump it up to the next higher court. Most people quit after she bumped it up to the next higher court.

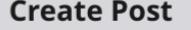
 588 Comments  Give Award  Share  Save ...

**About Community** 

For all your stories of small victories over those who've wronged you.

**975k** Members **262** Online

 Created Nov 1, 2012



**Community options** 

**ADVERTISEMENT**    
Intel® Core™ i7 Processor.  ASUS Chromebook

# r/prorevenge



## Pro Revenge

Join

r/ProRevenge

Create Post

Hot New Top All Time ...

69.9k **Coworker tried to get me fired over breast implants, so I pulled a reverse uno card.**

TLDR: Coworker harassed me over having implants (which I only got because I had cancerous cells), I called her out, she reported me to HR for calling her out, I got a bunch of people to write statements of all the times she harassed me and she got fired instead. Also I've been told that isn't what a reverse uno is but I can't change it.

(EDIT: Just want to add that regardless of my reasons for getting implants, I still should not have been harassed over them. It just happened to be relevant here because it made Jill look like a real dick which is probably why she reported me.)

About Community

Have a story of you or someone you know getting back at someone with pro revenge after being wronged? Post it here!

1.1m Members 472 Online

Created Nov 14, 2012

Create Post

Community options

**r/ProRevenge Rules**

1. Posts must be stories of revenge
2. Posts must be feasibly possible

# Preprocessing

# [removed] posts were filtered out during the scrape

```
for submission in data:  
    try:  
        if submission["selftext"] != "[removed]":  
            subCount+=1  
            aggregate.append(submission)  
        else:  
            pass  
    except:  
        pass
```

# ‘Selftext’ Rows with null values were dropped

```
1 # checking for null values
2
3 sorted_df.isnull().sum()

title      0
selftext    8
subreddit  0
dtype: int64
```

		title	selftext	subreddit
408	Does anyone know how to make an account on bad...		NaN	pettyrevenge
872	my boyfriend (gay) dumped me, so I catfished h...		NaN	ProRevenge
1020	Client stiffed me on payment after I SEO optim...		NaN	ProRevenge
1068		K	NaN	ProRevenge
1082	Identity thieves phone Njm		NaN	ProRevenge
1158	How I went “Heathers”		NaN	ProRevenge
1447	Pp touch		NaN	ProRevenge
1580	Oof, I'm pretty sure my text text text te...		NaN	ProRevenge

# **posts were further processed**

step 1. Remove links

step 2. Remove punctuation and other weird characters

step 3. Remove stop words

step 4. Remove words with less than 3 letters

step 5. Lemmatise tokens

# Word Count < 85 dropped

	title	selftext	subreddit	text	wordcount
7	e		e pettyrevenge		0
10	Vui thôi đừng vui quá :))	Funny dog haha	pettyrevenge	funny haha	10
303	Would pay good money for this	Just saw this. There's only the one ex I have ...	pettyrevenge	would good money mind	21
341	Fart story	My brother blamed me for farting at school, so...	pettyrevenge	fart story brother blamed farting school night...	64
522	(Request) I have a person phone number. I real...	Title	pettyrevenge	request person phone number really like anythi...	59
528	CALL THIS GUY AND DONT STOP	Hey guys so this guy was being mean to my favo...	pettyrevenge	call dont stop guy mean favorite streamer call...	98
582	Please sign	<a href="https://www.change.org/p/reddit-have-elon-mus...">https://www.change.org/p/reddit-have-elon-mus...</a>	pettyrevenge	please sign	11
717	Shadow	I think yes!!	pettyrevenge	shadow think	12

# Count Vectoriser



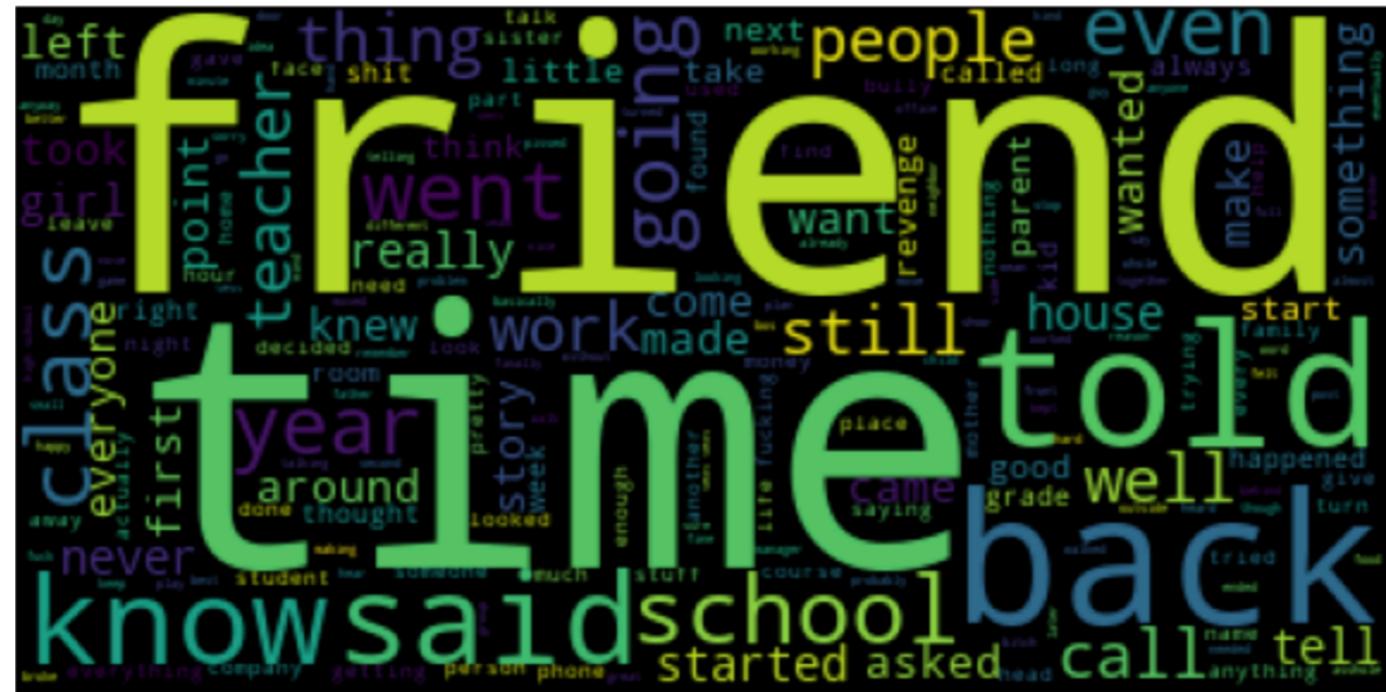
# TF-IDF Vectoriser



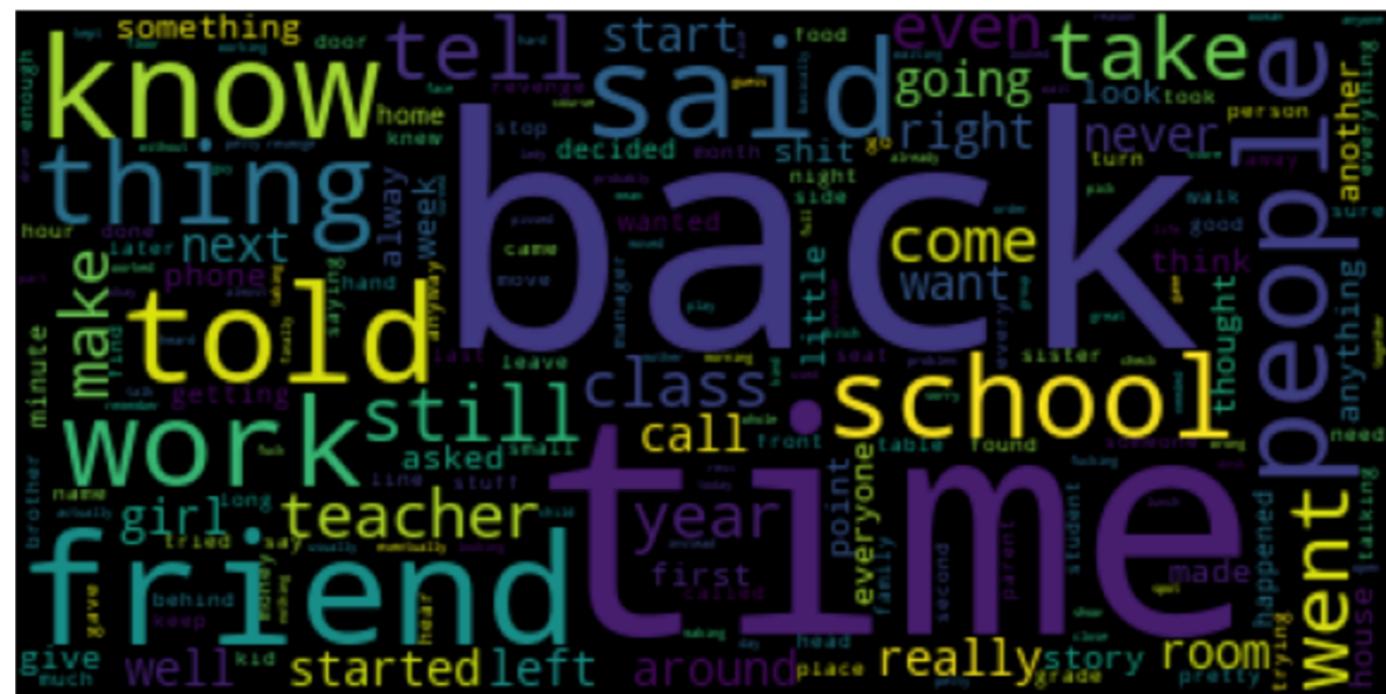


# **EDA**

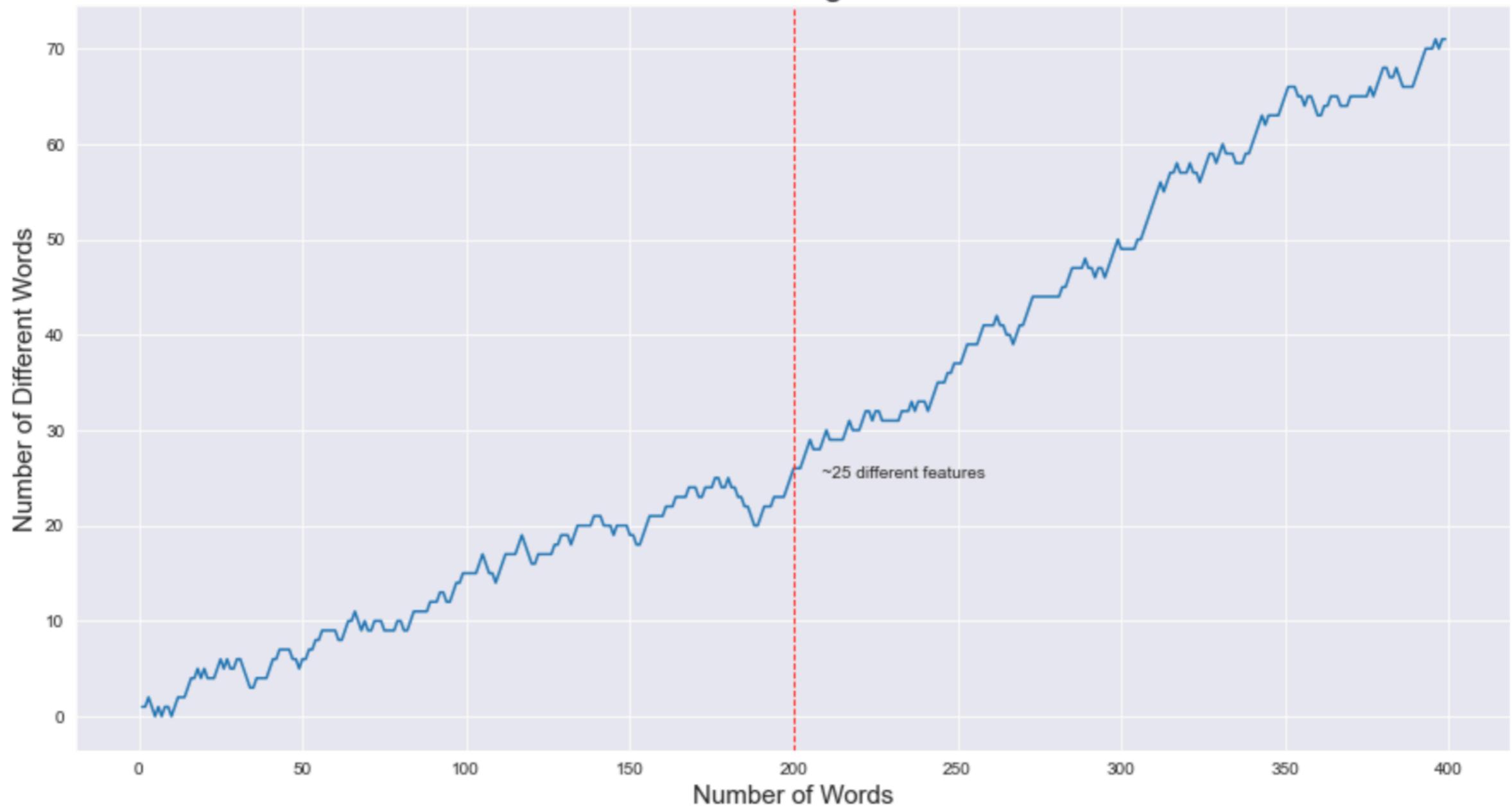
# r/pettyrevenge



# r/ProRevenge



## Number of Different words against Number of Words



# Data Cleaning

# shared words in top 200 words dropped

```
# Creating a function to return a list of shared words

def shared_words(data1, data2, no_w):

    for i in range (1, no_of_words):

        list1 = list(find_top_words(data1,no_w).index)
        list2 = list(find_top_words(data2,no_w).index)

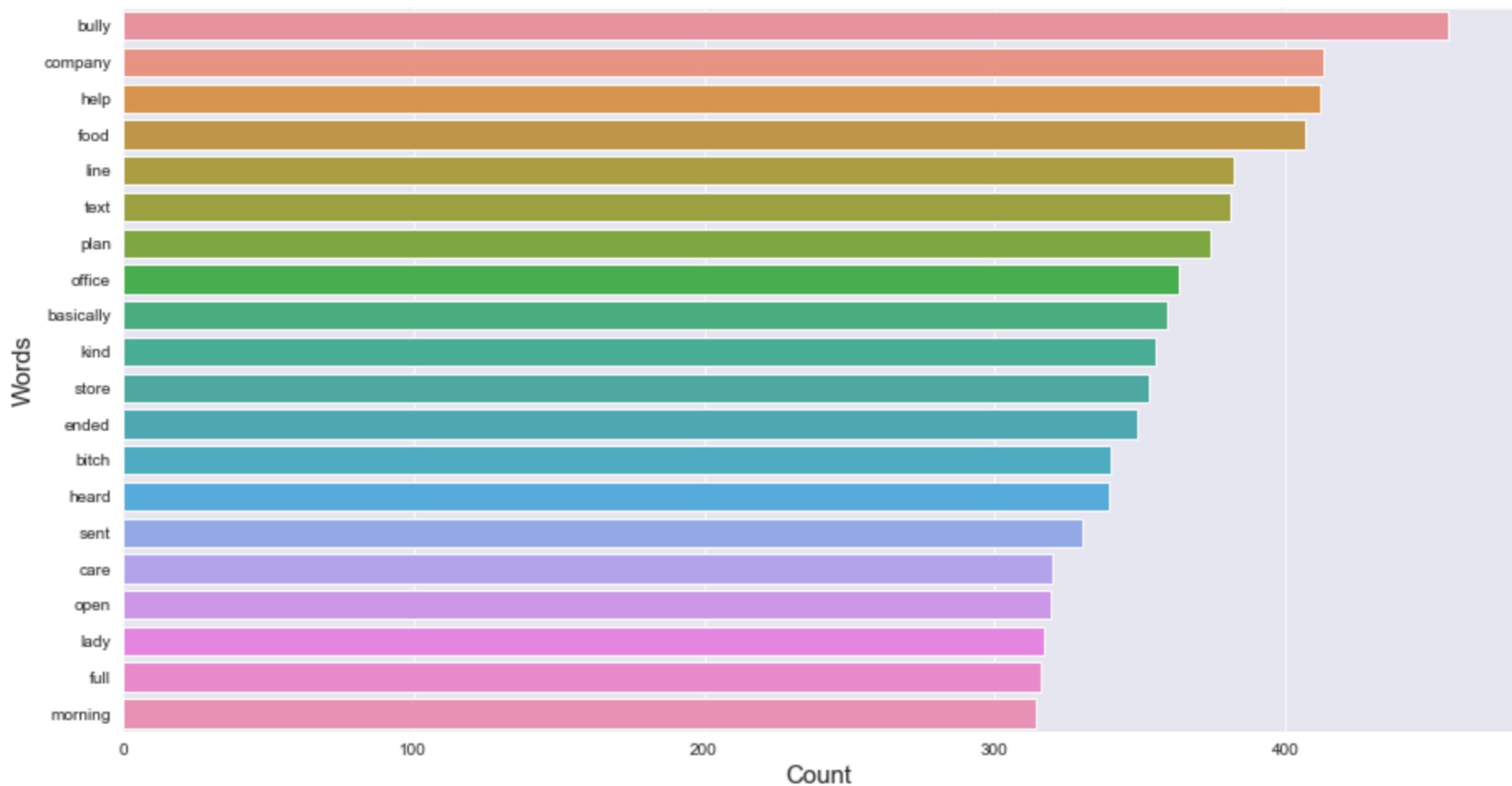
        shared_list = [word for word in list1 if word in list2]

    return shared_list
```

# “petty” and “pro” dropped

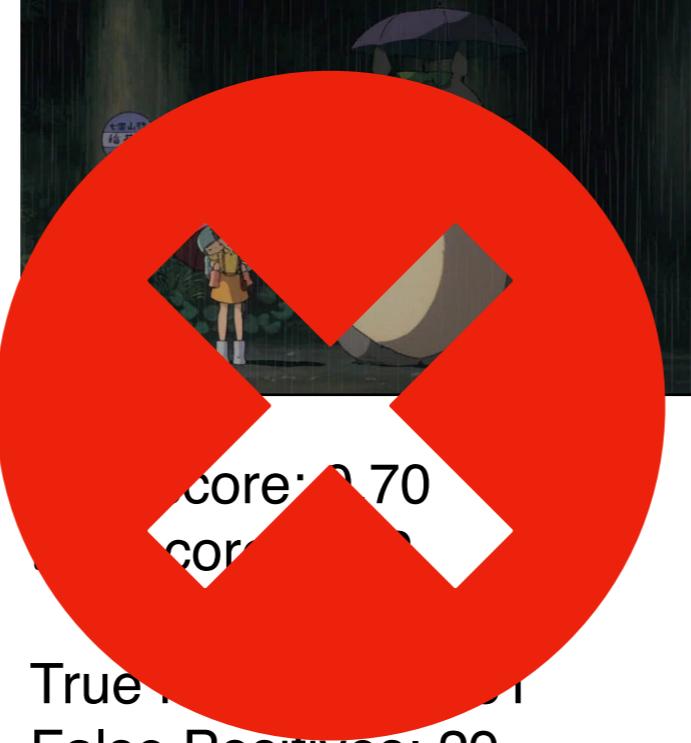
```
1 # removing "petty" and "pro" from the dataset.  
2 for i in ["petty", "pro"]:  
3     try:  
4         final_df.drop(columns = [i], inplace = True)  
5     except:  
6         pass
```

CountVectorized Scores of top 20 unique words from both subreddits



# Model Selection

Multinomial Naive Bayes	K Nearest Neighbors	Random Forest
MultinomialNB()	KNearestNeighborsClassifier()	RandomForestClassifier()
		
<p>train score: 0.76  test score: 0.66</p> <p>True Negatives: 147  False Positives: 63  False Negatives: 75  True Positives: 126</p>	<p>train score: 0.70  test score: 0.52</p> <p>True Negatives: 181  False Positives: 29  False Negatives: 170  True Positives: 31</p>	<p>train score: 0.77  test score: 0.71</p> <p>True Negatives: 148  False Positives: 62  False Negatives: 59  True Positives: 142</p>

Multinomial Naive Bayes	K Nearest Neighbors	Random Forest
MultinomialNB()	KNearestNeighborsClassifier()	RandomForestClassifier()
 <p>True Negatives: 177 False Positives: 63 False Negatives: 75 True Positives: 126</p>	 <p>True Negatives: 131 False Positives: 29 False Negatives: 170 True Positives: 31</p>	 <p>train score: 0.77 test score: 0.71</p> <p>True Negatives: 148 False Positives: 62 False Negatives: 59 True Positives: 142</p>

# **Model Optimisation**

## Random Forest

RandomForestClassifier ( )



train score:

0.75

test score:

0.73

True Negatives: 154

False Positives: 56

False Negatives: 56

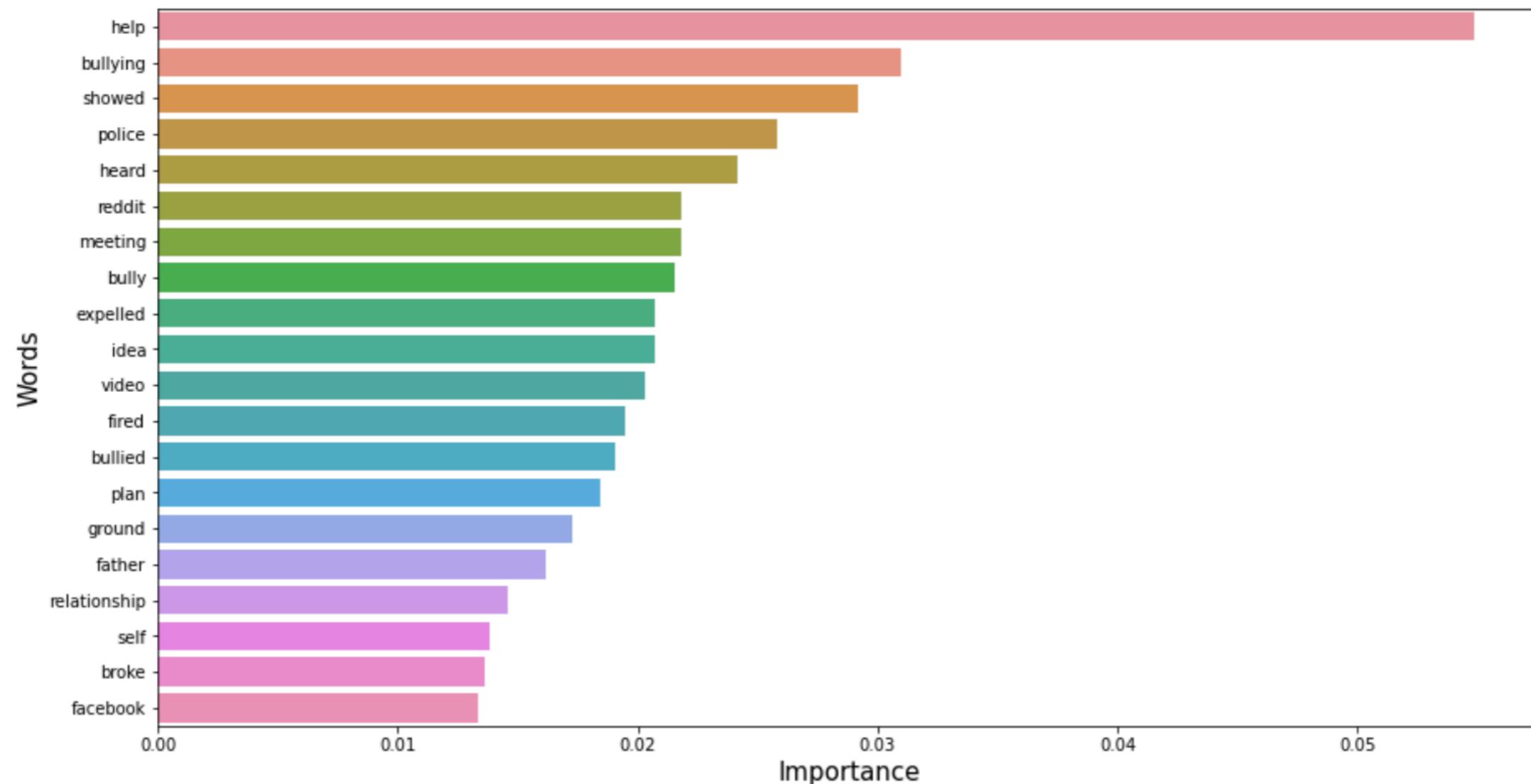
True Positives: 145

Best parameters set:

'max\_depth': 2

'n\_estimators': 166

### Top Feature Importances



# Examination of features

```
1 feature_df.sort_values(by = "Importance", ascending = False).head(100).index  
  
Index(['help', 'bullying', 'showed', 'police', 'heard', 'reddit', 'meeting',  
       'bully', 'expelled', 'idea', 'video', 'fired', 'bullied', 'plan',  
       'ground', 'father', 'relationship', 'self', 'broke', 'facebook',  
       'company', 'talked', 'evidence', 'ended', 'state', 'hole', 'cry',  
       'helped', 'result', 'fake', 'kind', 'great', 'involved', 'loved',  
       'barely', 'office', 'worry', 'seriously', 'lived', 'table', 'address',  
       'claim', 'caught', 'town', 'social', 'cop', 'abuse', 'laugh', 'huge',  
       'message', 'others', 'experience', 'sent', 'page', 'number', 'club',  
       'pushed', 'chat', 'world', 'information', 'began', 'kicked', 'picture',  
       'private', 'several', 'food', 'mobile', 'lost', 'soon', 'along',  
       'basically', 'situation', 'space', 'real', 'gotten', 'telling',  
       'principal', 'beat', 'recording', 'beginning', 'weekend', 'asks',  
       'contact', 'anger', 'confused', 'mine', 'apparently', 'felt', 'read',  
       'weird', 'text', 'forward', 'meet', 'grocery', 'kitchen', 'reported',  
       'became', 'seemed', 'poor', 'roommate'],  
      dtype='object')
```

The words "Bully" and it's derivatives, as well as the word "abuse" hint that presence of hostile intent from the offending party could cause further escalation.

# Examination of features

```
1 feature_df.sort_values(by = "Importance", ascending = False).head(100).index  
  
Index(['help', 'bullying', 'showed', 'police', 'heard', 'reddit', 'meeting',  
       'bully', 'expelled', 'idea', 'video', 'fired', 'bullied', 'plan',  
       'ground', 'father', 'relationship', 'self', 'broke', 'facebook',  
       'company', 'talked', 'evidence', 'ended', 'state', 'hole', 'cry',  
       'helped', 'result', 'fake', 'kind', 'great', 'involved', 'loved',  
       'barely', 'office', 'worry', 'seriously', 'lived', 'table', 'address',  
       'claim', 'caught', 'town', 'social', 'cop', 'abuse', 'laugh', 'huge',  
       'message', 'others', 'experience', 'sent', 'page', 'number', 'club',  
       'pushed', 'chat', 'world', 'information', 'began', 'kicked', 'picture',  
       'private', 'several', 'food', 'mobile', 'lost', 'soon', 'along',  
       'basically', 'situation', 'space', 'real', 'gotten', 'telling',  
       'principal', 'beat', 'recording', 'beginning', 'weekend', 'asks',  
       'contact', 'anger', 'confused', 'mine', 'apparently', 'felt', 'read',  
       'weird', 'text', 'forward', 'meet', 'grocery', 'kitchen', 'reported',  
       'became', 'seemed', 'poor', 'roommate'],  
      dtype='object')
```

Words such as "help", "broke" and "cry" imply a certain level of desperation

# Examination of features

```
1 feature_df.sort_values(by = "Importance", ascending = False).head(100).index  
  
Index(['help', 'bullying', 'showed', 'police', 'heard', 'reddit', 'meeting',  
       'bully', 'expelled', 'idea', 'video', 'fired', 'bullied', 'plan',  
       'ground', 'father', 'relationship', 'self', 'broke', 'facebook',  
       'company', 'talked', 'evidence', 'ended', 'state', 'hole', 'cry',  
       'helped', 'result', 'fake', 'kind', 'great', 'involved', 'loved',  
       'barely', 'office', 'worry', 'seriously', 'lived', 'table', 'address',  
       'claim', 'caught', 'town', 'social', 'cop', 'abuse', 'laugh', 'huge',  
       'message', 'others', 'experience', 'sent', 'page', 'number', 'club',  
       'pushed', 'chat', 'world', 'information', 'began', 'kicked', 'picture',  
       'private', 'several', 'food', 'mobile', 'lost', 'soon', 'along',  
       'basically', 'situation', 'space', 'real', 'gotten', 'telling',  
       'principal', 'beat', 'recording', 'beginning', 'weekend', 'asks',  
       'contact', 'anger', 'confused', 'mine', 'apparently', 'felt', 'read',  
       'weird', 'text', 'forward', 'meet', 'grocery', 'kitchen', 'reported',  
       'became', 'seemed', 'poor', 'roommate'],  
      dtype='object')
```

Some words allude to forward planning in carrying out revenge

- 1) the presence of a hostile party
- 2) level of desperation of the victim
- 3) forward planning.

The screenshot shows the homepage of the r/NuclearRevenge subreddit. At the top, there's a banner with the title "Nuclear Revenge" and a "Joined" button. Below the banner, there's a "Create Post" button and a navigation bar with "Hot", "New", "Top", and "All Time" options. A pinned post by u/claycam6 titled "Contingent Mod" is displayed, with 766 upvotes and 16 comments. Another post by u/petyrlabonov titled "Second Cakeday of r/Nuclearrevenge" is shown, with 1.1k upvotes and 214 comments. The sidebar includes an "About Community" section with a detailed description of the subreddit's purpose and rules, and a "Community options" dropdown.

The screenshot shows the homepage of the r/MaliciousCompliance subreddit. At the top, there's a banner with the title "Malicious Compliance" and a "Joined" button. Below the banner, there's a "Create Post" button and a navigation bar with "Hot", "New", "Top", and "All Time" options. A post by u/gaudiocomplex titled "My wife, a Venezuelan smartass" is displayed, with 76.0k upvotes and 2 comments. The sidebar includes an "About Community" section with a brief description of the subreddit's purpose, and a "Community options" dropdown.

While the task was to compare only 2 subreddits, it could be argued that creating a "scale" of maliciousness by using several other "revenge" subreddits, such as r/nuclearrevenge or r/maliciouscompliance, would serve to better highlight the nuances in the text

**End**