```python
import pandas as pd
import sys
import time
```

```python
df = pd.read_csv("philosophy_data.csv")
```

```python
df.head()
```

	title	author	school	sentence_spacy	sentence_s
0	Plato - Complete Works	Plato	plato	What's new, Socrates, to make you leave your ...	What's ne Socrates, make yc leave your
1	Plato - Complete Works	Plato	plato	Surely you are not prosecuting anyone before t...	Surely yc are n prosecutir anyor before t
2	Plato - Complete Works	Plato	plato	The Athenians do not call this a prosecution b...	Tl Athenians c not call this prosecutic b
3	Plato - Complete Works	Plato	plato	What is this you say?	What is th you sa
4	Plato - Complete Works	Plato	plato	Someone must have indicted you, for you are no...	Someor must ha indicted yc for you a nc

```python
import numpy as np
```

```
In [38]: sen=df[['school', 'sentence_length', 'sentence_lo
```

```
In [39]: print(type(df))
         print(type(sen))
```

```
<class 'pandas.core.frame.DataFrame'>
<class 'pandas.core.frame.DataFrame'>
```

plato

```
In [40]: plato = sen[sen['school'] == "plato"]
         plato.head()
```

Out[40]:

	school	sentence_length	sentence_lowered
0	plato	125	what's new, socrates, to make you leave your ...
1	plato	69	surely you are not prosecuting anyone before t...
2	plato	74	the athenians do not call this a prosecution b...
3	plato	21	what is this you say?
4	plato	101	someone must have indicted you, for you are no...

```
In [41]: len(plato)
```

Out[41]: 38366

sentence length

```
In [42]: plato_sentence_length = plato['sentence_length']
```

```
In [43]: plato_sentence_float = plato_sentence_length.asty
```

```
In [56]: plato_sentence_float = np.flip(plato_sentence_flo
```
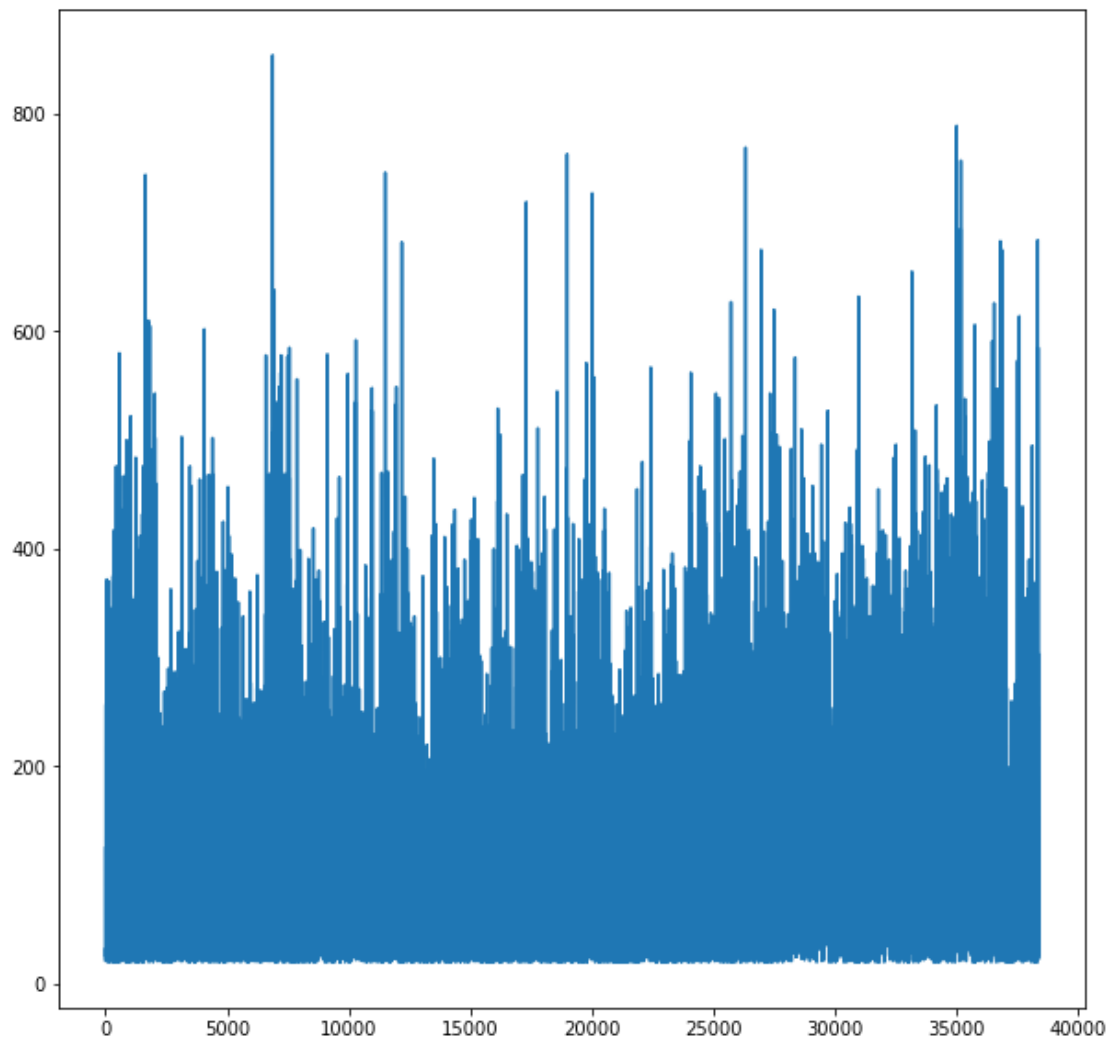
visualize

```
In [59]: from matplotlib import pyplot as plt
         plt.rcParams["figure.figsize"] = (10,10)
```

```
In [ ]:
```

```
In [ ]: # TODO: Moving Average, smoothing
```

```
In [63]:  plt.plot(plato_sentence_float)
```

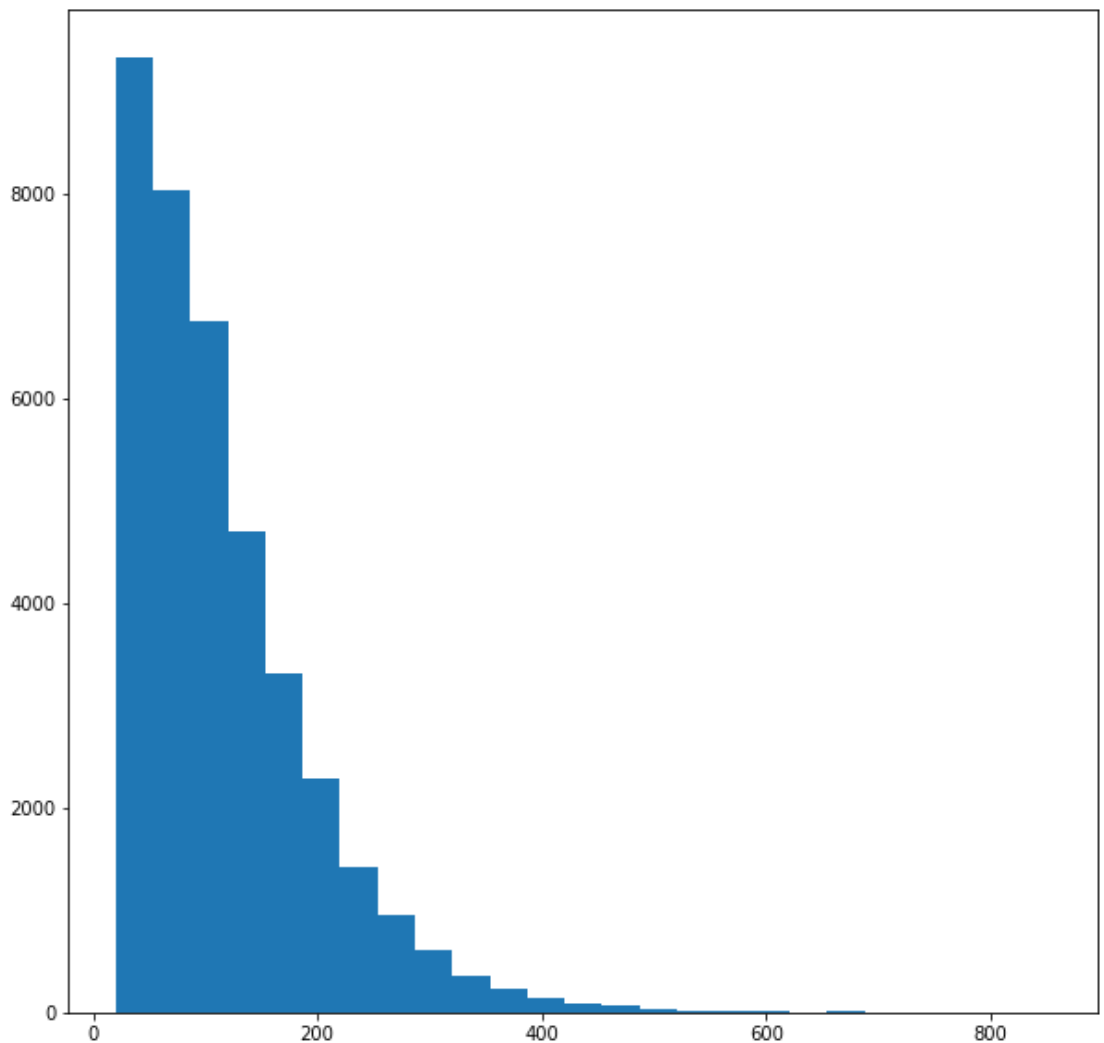Out[63]: [<matplotlib.lines.Line2D at 0x7f9e4307f5c0>]


```
In [62]:  plt.hist(plato_sentence_float, bins=25)
```

Out[62]: (array([9.325e+03, 8.038e+03, 6.749e+03, 4.699e+
          03, 3.302e+03, 2.288e+03,
                  1.415e+03, 9.600e+02, 6.070e+02, 3.550e+
          02, 2.290e+02, 1.490e+02,
                  8.100e+01, 7.200e+01, 3.100e+01, 2.000e+
          01, 1.800e+01, 8.000e+00,
                  4.000e+00, 6.000e+00, 2.000e+00, 3.000e+
          00, 3.000e+00, 1.000e+00,
                  1.000e+00]),
           array([20. , 53.36, 86.72, 120.08, 153.44,
```

```
       186.8 , 220.16, 253.52,
              286.88, 320.24, 353.6 , 386.96, 420.32,
       453.68, 487.04, 520.4 ,
              553.76, 587.12, 620.48, 653.84, 687.2 ,
       720.56, 753.92, 787.28,
              820.64, 854.  ]),
        <a list of 25 Patch objects>)
```


In [71]:
```python
## Put them all together

plt.rcParams["figure.figsize"] = (10,100)
```

In [73]:
```python
sfs = {}
names = df.school.unique()
figure, axis = plt.subplots(len(names), 1)
i = 0
for name in names:
```

```
for name in names:
    print(name)
    school_df = sen[sen['school'] == name]
    sentence_length = school_df['sentence_length'
    sentence_float = sentence_length.astype('floa
    sentence_float = np.flip(sentence_float)

    axis[i].hist(sentence_float, bins=50)
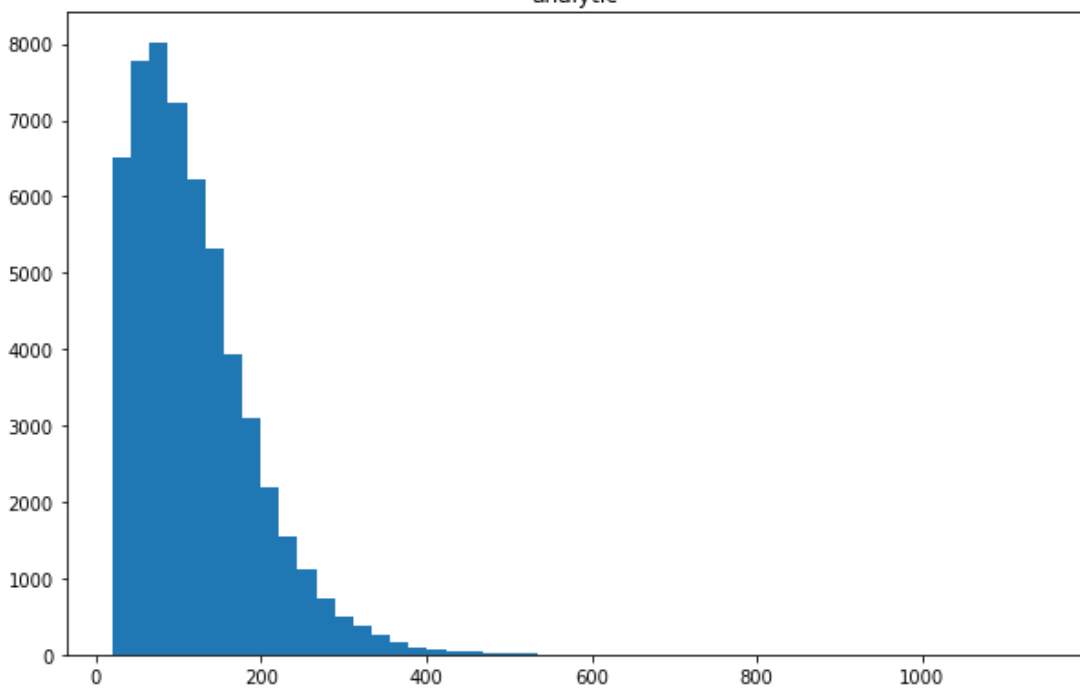    axis[i].set_title(names[i])
    i += 1
```

plato
aristotle
empiricism
rationalism
analytic
continental
phenomenology
german_idealism
communism
capitalism
stoicism
nietzsche
feminism

aristotle

empiricism

rationalism

analytic

continental

phenomenology

german_idealism

communism

capitalism

stoicism

nietzsche
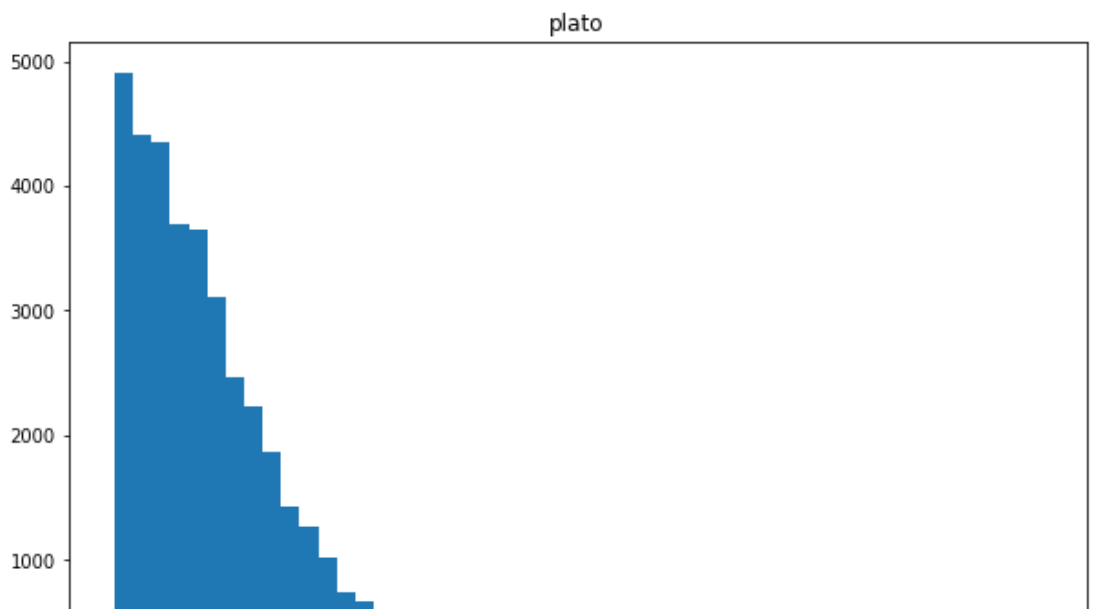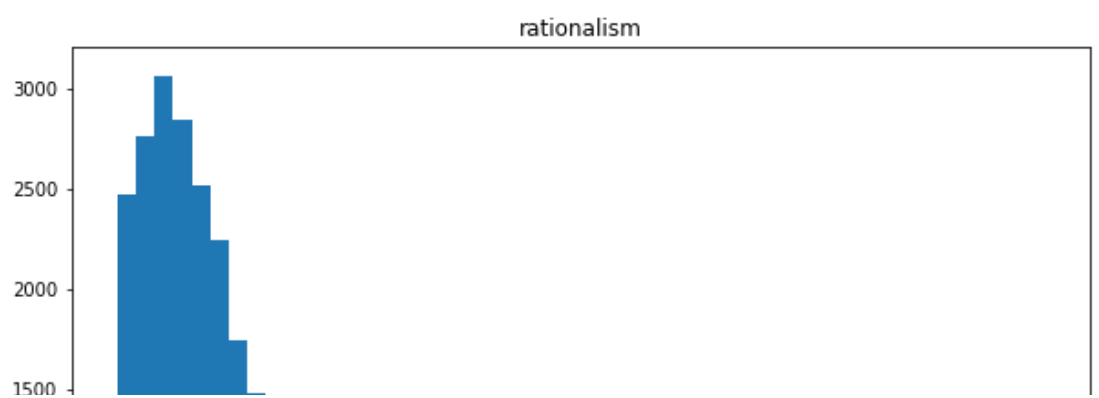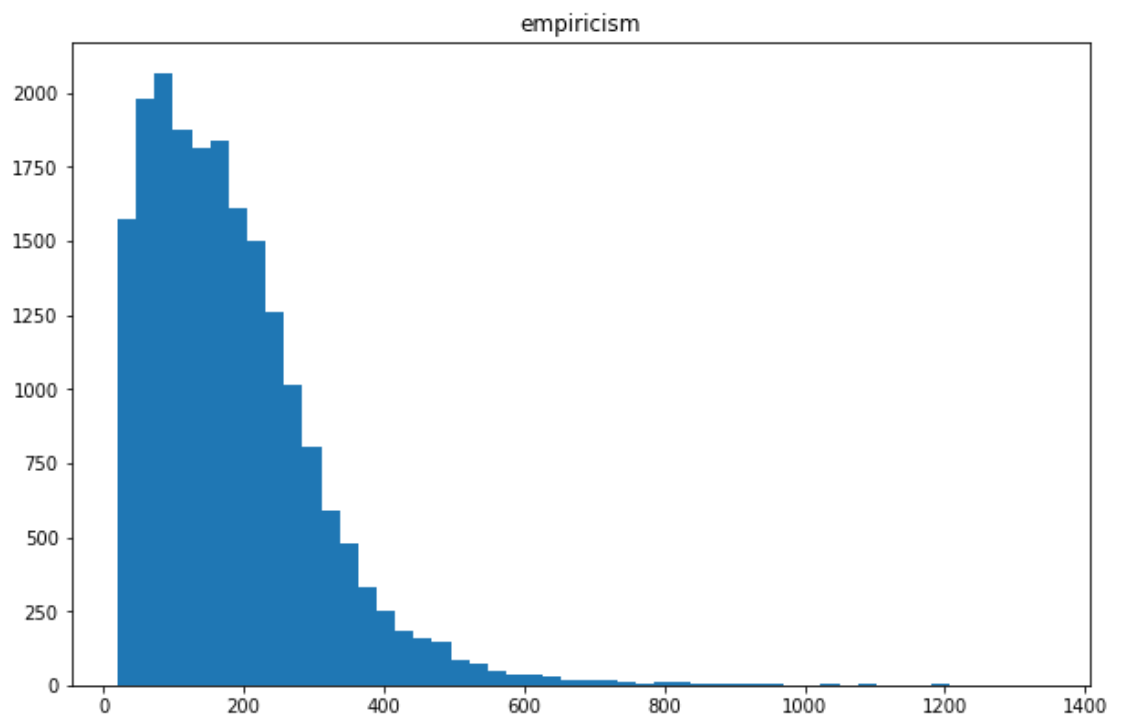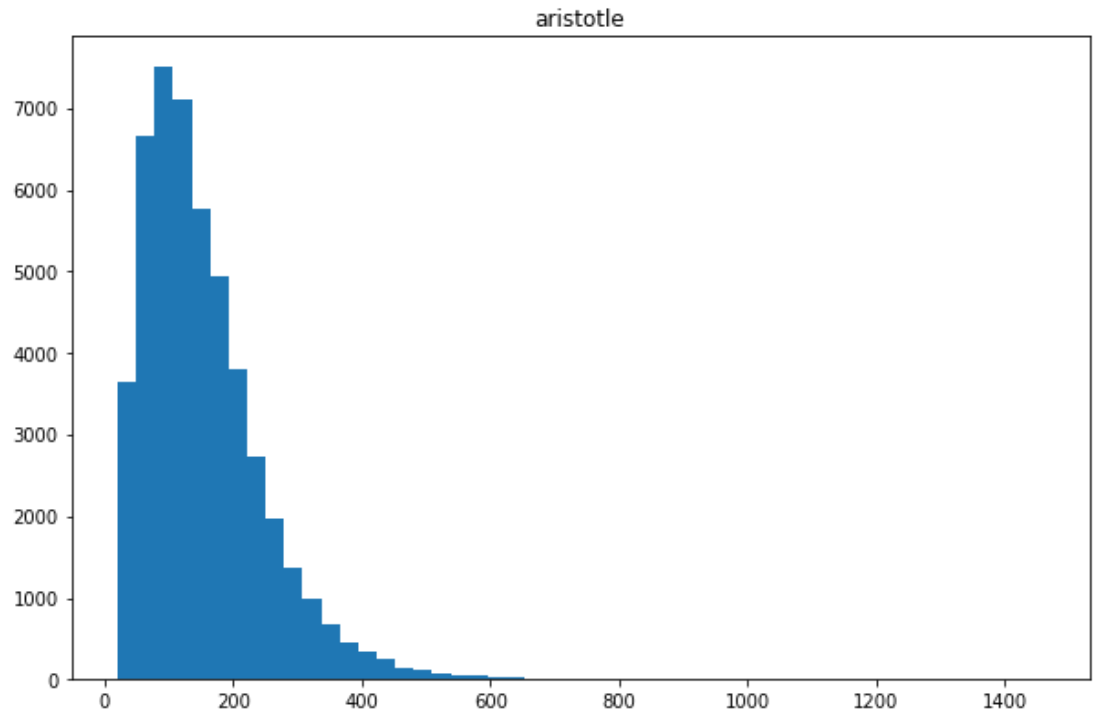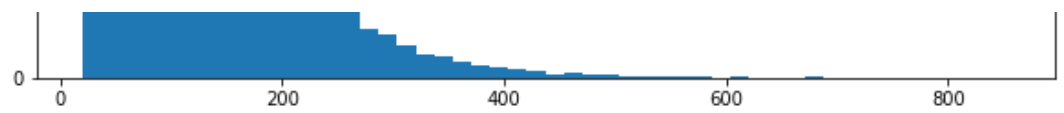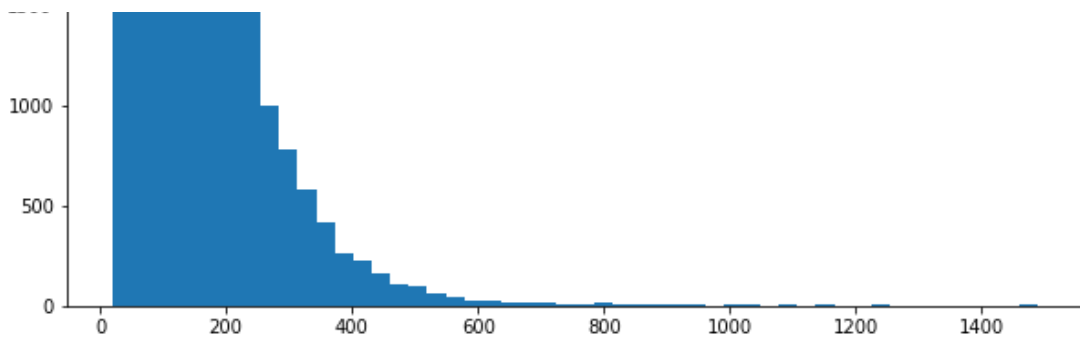
feminism
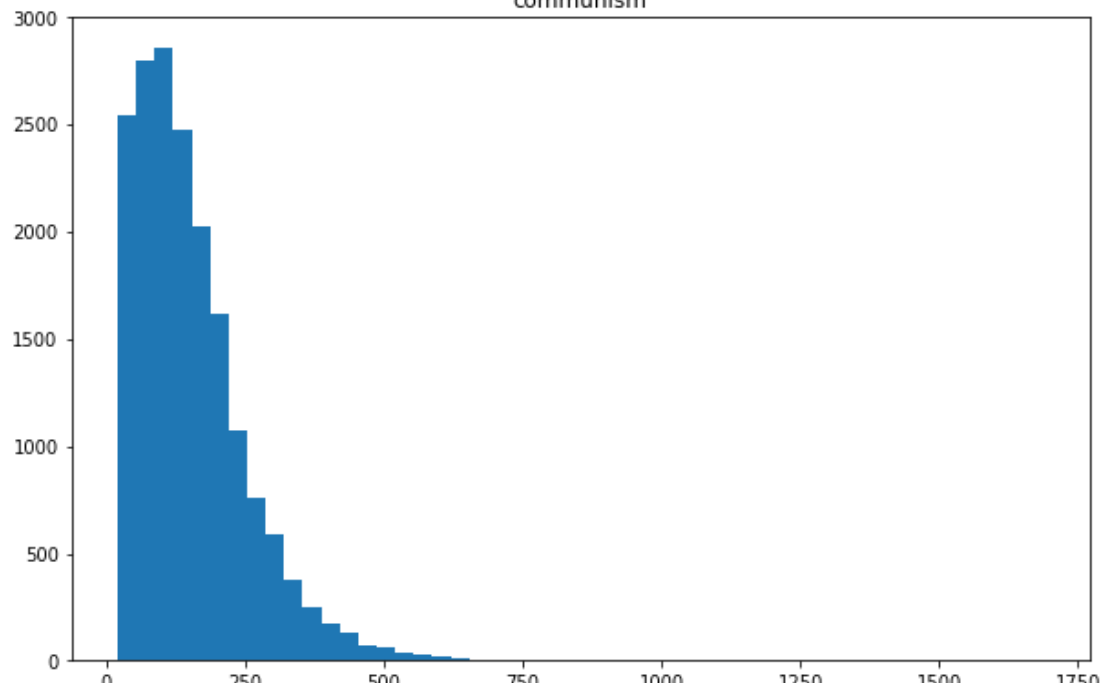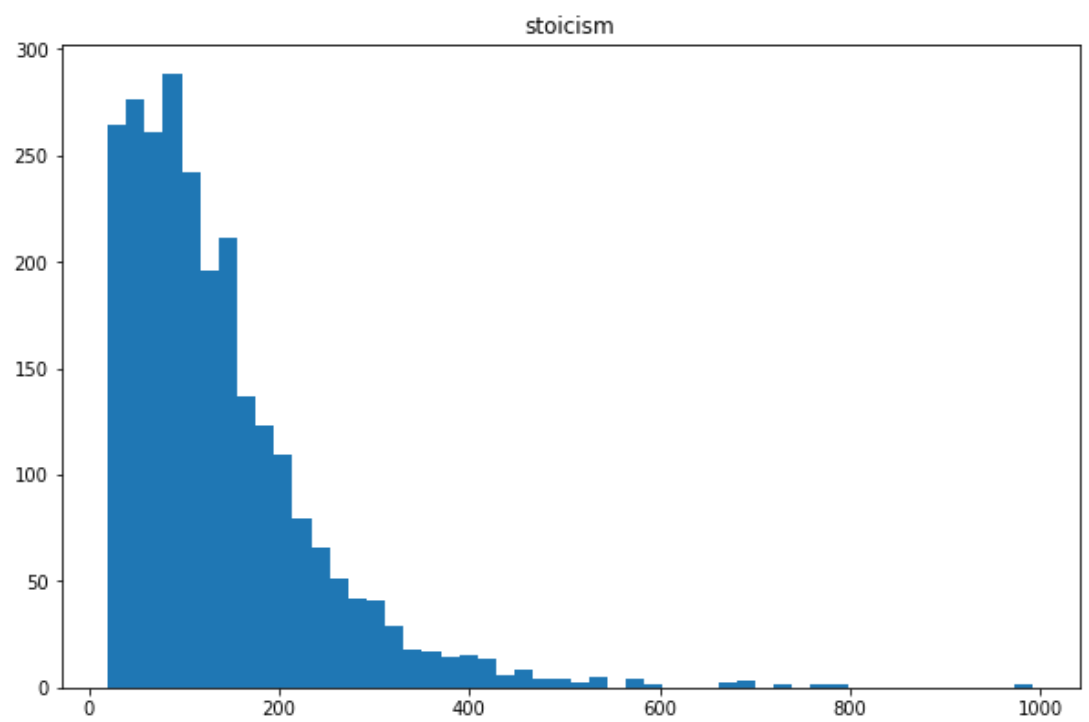
In [ ]:

punctuation emotion

In [ ]:
```python
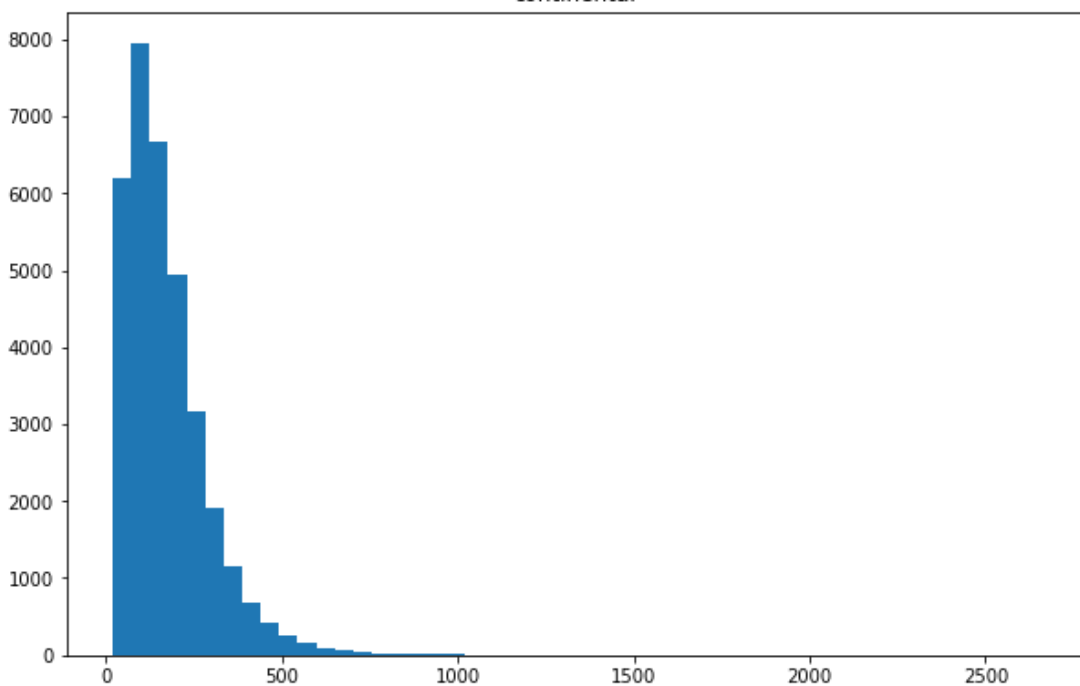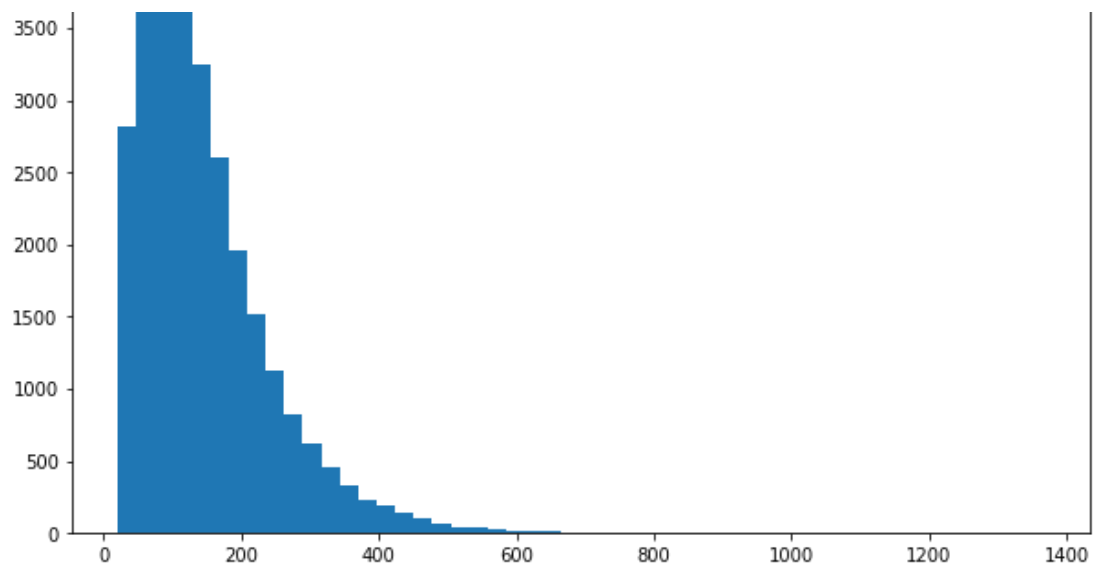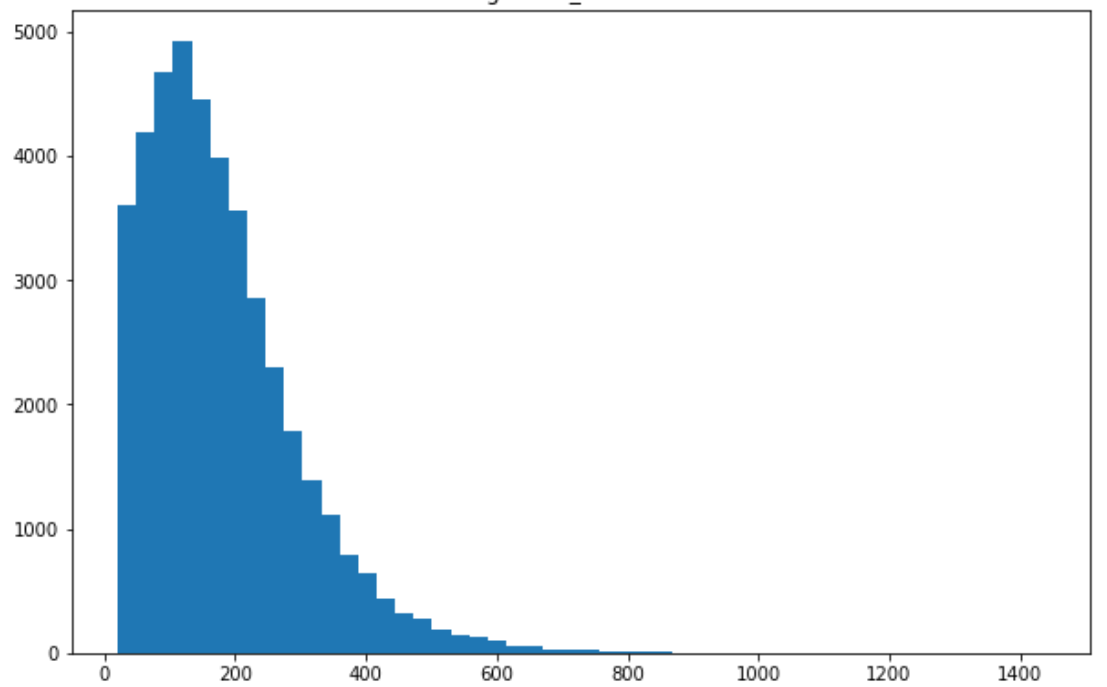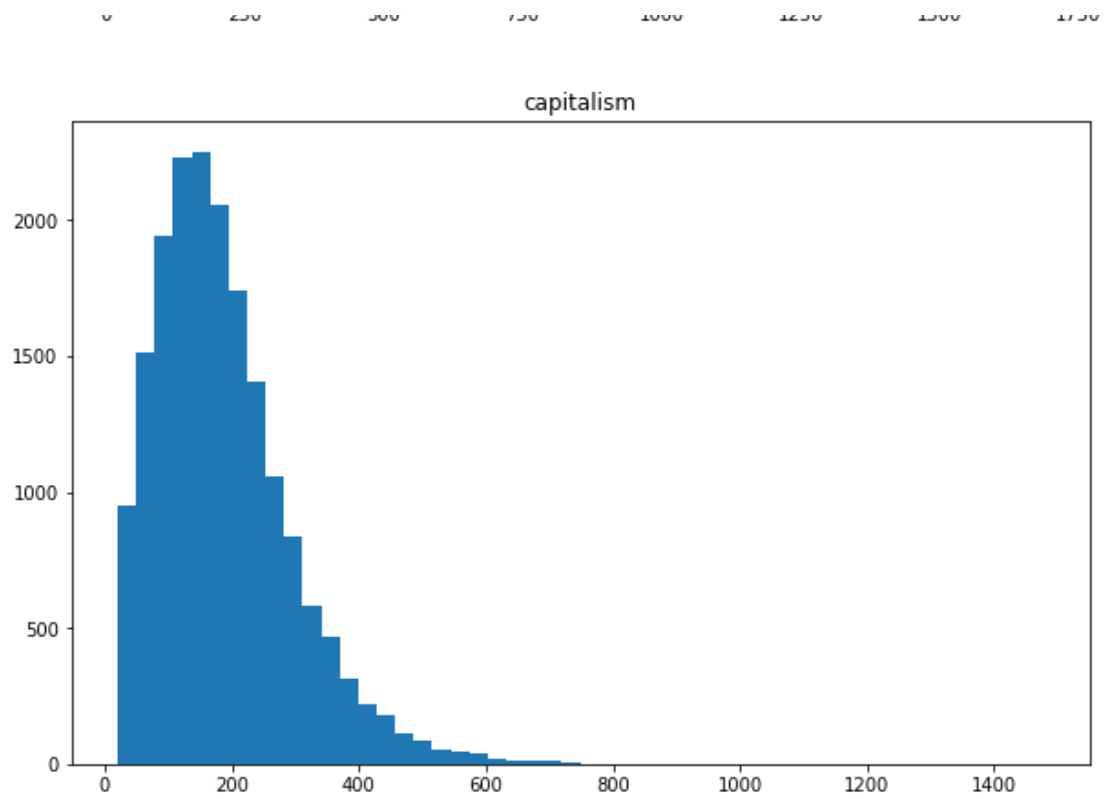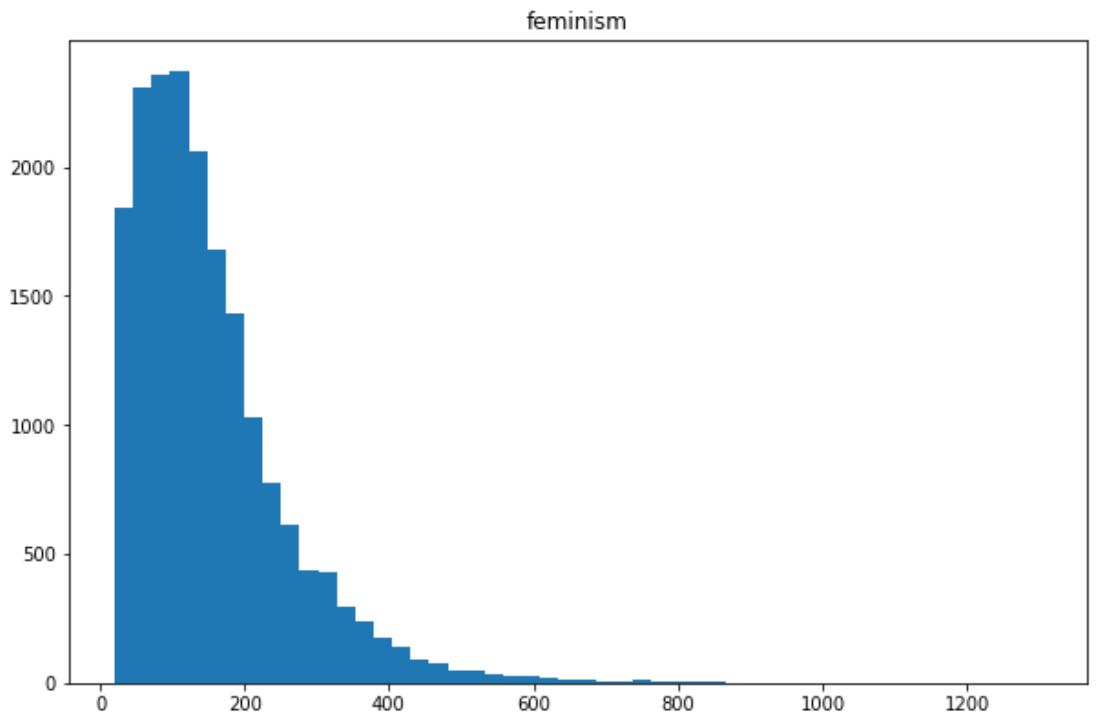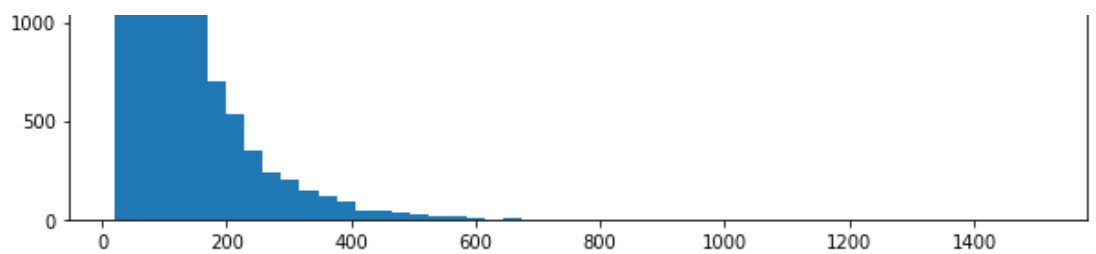count = 0;
#for i in range(len(plato)):
    for k in range (0, len (plato['sentence_lower
    #Checks whether given character is a punctuat
        for plato['sentence_lowered'][k] in ('!',
        count = count + 1;
print (count);


#i = i+1;
```

In [48]:
```python
sentence01 = plato['sentence_lowered'][0]
```

```python
#all puntuations number
count = 0;
str = sentence01;
for i in range (0, len (str)):
    if str[i] in ('!', "," ,"\'" ,";" ,"\"", ".",
        count = count + 1;

print ("Total number of punctuation characters ex
print (count);
```

Total number of punctuation characters exists in string:
5

```python
#check
sentence01
```

Out[57]: " what's new, socrates, to make you leave your usual haunts in the lyceum and spend your time here by the king archon's court?"

```python
#punctuations with emotions
count = 0;
str = sentence01;
for i in range (0, len (str)):
    if str[i] in ('!', "?"):
        count = count + 1;

print ("Total number of punctuation characters ex
print (count);
```

Total number of punctuation characters exists in string:
1

```
In [74]: # Putting it all together

In [79]: sfs = {}
         names = df.school.unique()
         i = 0
         ratios = []
         for name in names:
             print(name)
             school_df = sen[sen['school'] == name]
             #all puntuations number
             all_punc_count = 0
             exclam_punc_count = 0

             for entry in school_df.iterrows():  # Iterate
                 for char in entry[1].sentence_lowered:  #
                     if char in ('!', "," ,"\'" ,";" ,"\""
                         all_punc_count = all_punc_count +
                     if char in ('!', "?"):
                         exclam_punc_count = exclam_punc_c

             print ("Total number of punctuation character
             print (all_punc_count);

             print ("Total number of exclamation punctuati
             print (exclam_punc_count);

             print("exclamation ratio:")
             print(exclam_punc_count / all_punc_count)
             ratios.append(exclam_punc_count / all_punc_co

plato
Total number of punctuation characters exists in
plato
```

122675
Total number of exclamation punctuation characte
rs exists in plato
8847
exclamation ratio:
0.07211738332993682
aristotle
Total number of punctuation characters exists in
aristotle
165309
Total number of exclamation punctuation characte
rs exists in aristotle
3442
exclamation ratio:
0.02082161285834407
empiricism
Total number of punctuation characters exists in
empiricism
86113
Total number of exclamation punctuation characte
rs exists in empiricism
1444
exclamation ratio:
0.01676866442929639
rationalism
Total number of punctuation characters exists in
rationalism
74699
Total number of exclamation punctuation characte
rs exists in rationalism
643
exclamation ratio:
0.00860787962355587
analytic

Total number of punctuation characters exists in analytic
149130
Total number of exclamation punctuation characters exists in analytic
3654
exclamation ratio:
0.024502112251056127
continental
Total number of punctuation characters exists in continental
117422
Total number of exclamation punctuation characters exists in continental
1985
exclamation ratio:
0.016904838956924597
phenomenology
Total number of punctuation characters exists in phenomenology
82081
Total number of exclamation punctuation characters exists in phenomenology
1654
exclamation ratio:
0.02015082662248267
german_idealism
Total number of punctuation characters exists in german_idealism
149976
Total number of exclamation punctuation characters exists in german_idealism
1060
exclamation ratio:

0.0070677975142689.49

communism

Total number of punctuation characters exists in communism

64453

Total number of exclamation punctuation characters exists in communism

759

exclamation ratio:

0.011776022838347323

capitalism

Total number of punctuation characters exists in capitalism

73661

Total number of exclamation punctuation characters exists in capitalism

171

exclamation ratio:

0.0023214455410597197

stoicism

Total number of punctuation characters exists in stoicism

9246

Total number of exclamation punctuation characters exists in stoicism

435

exclamation ratio:

0.04704737183646982

nietzsche

Total number of punctuation characters exists in nietzsche

38609

Total number of exclamation punctuation characters exists in nietzsche

3822
exclamation ratio:
0.09899246289725194
feminism
Total number of punctuation characters exists in
feminism
66120
Total number of exclamation punctuation characte
rs exists in feminism
1043
exclamation ratio:
0.015774349667271627

In [82]:

```python
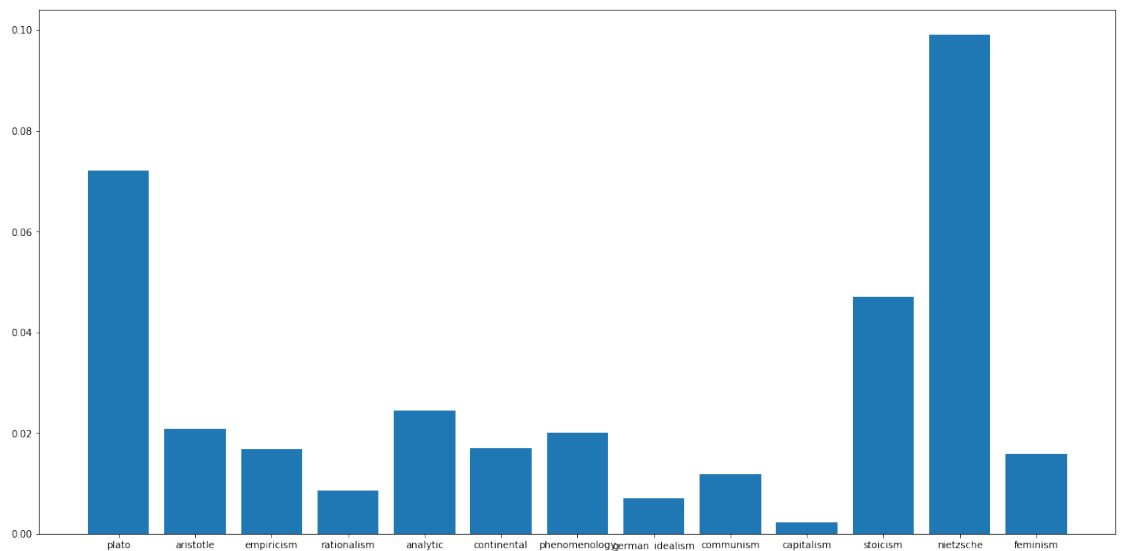plt.rcParams["figure.figsize"] = (20,10)
plt.bar(names, ratios)
```

Out[82]: <BarContainer object of 13 artists>