



```
In [25]: import pandas as pd
import numpy as np
from selenium import webdriver
from selenium.webdriver.common.by import By
from webdriver_manager.chrome import ChromeDriverManager
from selenium.webdriver.chrome.service import Service
from selenium.webdriver.chrome.options import Options
from selenium.common.exceptions import NoSuchElementException, TimeoutException

# Setup Chrome options (optional)
chrome_options = Options()
chrome_options.add_argument("--start-maximized")
chrome_options.add_argument("--disable-blink-features=AutomationControlled")

# Setup driver
service = Service(ChromeDriverManager().install())
driver = webdriver.Chrome(service=service, options=chrome_options)
```

```
In [26]: links = pd.read_excel('Input.xlsx')
links.shape
```

```
Out[26]: (170, 2)
```

```
In [27]: links.head()
```

```
Out[27]: URL_ID          URL
0      1  https://insights.blackcoffer.com/how-is-login...
1      2  https://insights.blackcoffer.com/how-does-ai-h...
2      3  https://insights.blackcoffer.com/ai-and-its-im...
3      4  https://insights.blackcoffer.com/how-do-deep-l...
4      5  https://insights.blackcoffer.com/how-artificia...
```

```
In [28]: def scrape_data(link):
    global driver
    try:
        driver.get(link)

        # Check if page actually loaded (404 pages often lack your target element)
        title = driver.find_element(By.XPATH, "//div[contains(@class, 'td-pb-page-title')]")
        driver.implicitly_wait(10)
        return title.text

    except NoSuchElementException:
        print("Skipping (content not found):", link)
        return None

    except (TimeoutException, WebDriverException):
        print("Skipping (page load error):", link)
```

```
    return None
```

```
In [29]: ## function to save the scrapped files
import os

def save_file(scrapdata):
    # Create folder if it doesn't exist
    os.makedirs("./Articles", exist_ok=True)

    for data in scrapdata:
        name = str(data['URL_ID']) + ".txt"
        filepath = os.path.join("./Articles", name)

        with open(filepath, 'w+', encoding='utf-8') as f:
            f.write(data['TEXT'])
```

```
In [30]: # Perform scraping
scrapdata = []

for index, row in links.iterrows():
    text = scrape_data(row['URL'])

    if text is None:
        continue # Skip 404 or failed pages

    item = {
        'URL_ID': row['URL_ID'],
        'TEXT': text
    }
    scrapdata.append(item)

save_file(scrapdata)
```

```
Skipping (content not found): https://insights.blackcoffer.com/how-do-deep-learning-models-predict-old-and-new-drugs-that-are-successfully-treated-in-healthcare/
Skipping (content not found): https://insights.blackcoffer.com/how-neural-networks-can-be-applied-in-various-areas-in-the-future/
Skipping (content not found): https://insights.blackcoffer.com/covid-19-environmental-impact-for-the-future/
Skipping (content not found): https://insights.blackcoffer.com/ensuring-growth-through-insurance-technology/
Skipping (content not found): https://insights.blackcoffer.com/big-data-analytics-solving-problems-banking-and-finance-industry/
```

```
In [31]: #making a dataframe of scrapped data
```

```
from os import listdir
path = 'file:///c:/Users/SuryaB/Desktop/sentimental-analysis-using-web-scrappe
files = listdir('./Articles/')
```

```
In [38]: rows = []
```

```

for file in files:
    with open('./Articles/' + file, 'r', encoding='utf-8') as f:
        text = f.read()

    # Extract number before ".txt"
    sr = int(os.path.splitext(file)[0])    # <-- the correct way

    rows.append({'File': sr, 'text': text})

df = pd.DataFrame(rows)

```

In [40]: df = df.sort\_values("File")  
df  
df.to\_csv('content.csv', index=None)

In [41]: df = pd.read\_csv('content.csv')  
df.head()

Out[41]:

	File	text
<b>0</b>	1	When people hear AI they often think about sen...
<b>1</b>	2	With increasing computing power and more data,...
<b>2</b>	3	If you were a fan of the 90's film Clueless ba...
<b>3</b>	5	From the stone age to the modern world, from h...
<b>4</b>	6	Artificial intelligence (AI) is the developmen...

In [42]: # Data Preprocessing  
df['Number of sentences'] = df['text'].apply(lambda x: len(str(x).split('. ')))

In [43]: def short\_forms():
return {
 "cant": "can not",
 "dont": "do not",
 "wont": "will not",
 "ain't": "is not",
 "amn't": "am not",
 "aren't": "are not",
 "can't": "cannot",
 "'cause": "because",
 "couldn't": "could not",
 "couldn't've": "could not have",
 "could've": "could have",
 "daren't": "dare not",
 "daresn't": "dare not",
 "dasn't": "dare not",
 "didn't": "did not",
 "doesn't": "does not",
 "don't": "do not",
 "e'er": "ever",

```
"em":"them",
"everyone's":"everyone is",
"finna":"fixing to",
"gimme":"give me",
"gonna":"going to",
"gon't":"go not",
"gotta":"got to",
"hadn't":"had not",
"hasn't":"has not",
"haven't":"have not",
"he'd":"he would",
"he'll":"he will",
"he's":"he is",
"he've":"he have",
"how'd":"how would",
"how'll":"how will",
"how're":"how are",
"how's":"how is",
"I'd":"I would",
"I'll":"I will",
"I'm":"I am",
"I'm'a":"I am about to",
"I'm'o":"I am going to",
"isn't":"is not",
"it'd":"it would",
"it'll":"it will",
"it's":"it is",
"I've":"I have",
"kinda":"kind of",
"let's":"let us",
"mayn't":"may not",
"may've":"may have",
"mightn't":"might not",
"might've":"might have",
"mustn't":"must not",
"mustn't've":"must not have",
"must've":"must have",
"needn't":"need not",
"ne'er":"never",
"o' ":"of",
"o'er":"over",
"ol' ":"old",
"oughtn't":"ought not",
"shalln't":"shall not",
"shan't":"shall not",
"she'd":"she would",
"she'll":"she will",
"she's":"she is",
"shouldn't":"should not",
"shouldn't've":"should not have",
"should've":"should have",
"somebody's":"somebody is",
"someone's":"someone is",
```

```
"something's":"something is",
"that'd":"that would",
"that'll":"that will",
"that're":"that are",
"that's":"that is",
"there'd":"there would",
"there'll":"there will",
"there're":"there are",
"there's":"there is",
"these're":"these are",
"they'd":"they would",
"they'll":"they will",
"they're":"they are",
"they've":"they have",
>this's":"this is",
"those're":"those are",
"'tis":"it is",
"'twas":"it was",
"wanna":"want to",
"wasn't":"was not",
"we'd":"we would",
"we'd've":"we would have",
"we'll":"we will",
"we're":"we are",
"weren't":"were not",
"we've":"we have",
"what'd":"what did",
"what'll":"what will",
"what're":"what are",
"what's":"what is",
"what've":"what have",
"when's":"when is",
"where'd":"where did",
"where're":"where are",
"where's":"where is",
"where've":"where have",
"which's":"which is",
"who'd":"who would",
"who'd've":"who would have",
"who'll":"who will",
"who're":"who are",
"who's":"who is",
"who've":"who have",
"why'd":"why did",
"why're":"why are",
"why's":"why is",
"won't":"will not",
"wouldn't":"would not",
"would've":"would have",
>y'all":"you all",
"you'd":"you would",
"you'll":"you will",
"you're":"you are",
```

```
"you've": "you have",
"Whatcha": "What are you",
"luv": "love",
"sux": "sucks",
"couldn't": "could not",
"wouldn't": "would not",
"shouldn't": "should not",
"im": "i am"
}
```

```
In [45]: import re
import string

def normalization(data):
    data = str(data).lower()

    # URL removal – now actually valid
    data = re.sub(r'((www\.[^\s]+)|(https?://[^\s]+))', ' ', data)

    # Hashtag cleanup
    data = re.sub(r'#([^\s]+)', r'\1', data)

    # Remove numbers
    data = ''.join([i for i in data if not i.isdigit()])

    # Replace punctuation with space
    for sym in string.punctuation:
        data = data.replace(sym, " ")

    # Replace fancy apostrophe
    data = data.replace("’", "'")

    # Short forms
    short_form = short_forms()
    words = data.split()
    converted = [short_form[word] if word in short_form else word for word in words]

    return " ".join(converted)
```

```
In [46]: df
```

Out[46]:

	File	text	Number of sentences
0	1	When people hear AI they often think about sen...	19
1	2	With increasing computing power and more data,...	20
2	3	If you were a fan of the 90's film Clueless ba...	39
3	5	From the stone age to the modern world, from h...	44
4	6	Artificial intelligence (AI) is the developmen...	37
...	...	...	...
160	167	CAN ACADEMIA, RESEARCHERS, DECISION MAKERS AND...	42
161	168	Introduction\nInventory planning is a fundamen...	29
162	169	1. The Problem\nInsider threat detection speci...	48
163	170	If we talk in terms of our general life, Exfil...	22
164	171	Some vendors (fruit and vegetable sellers) beg...	21

165 rows × 3 columns

In [49]: df['text']= df['text'].apply(normalization)

In [50]: df

Out[50]:

	File	text	Number of sentences
0	1	when people hear ai they often think about sen...	19
1	2	with increasing computing power and more data ...	20
2	3	if you were a fan of the s film clueless back ...	39
3	5	from the stone age to the modern world from hu...	44
4	6	artificial intelligence ai is the development ...	37
...	...	...	...
160	167	can academia researchers decision makers and p...	42
161	168	introduction inventory planning is a fundament...	29
162	169	the problem insider threat detection specifica...	48
163	170	if we talk in terms of our general life exfilt...	22
164	171	some vendors fruit and vegetable sellers began...	21

165 rows × 3 columns

```
In [51]: df['text']= df['text'].apply(lambda x: x.lower())
```

```
In [52]: df
```

Out[52]:

	File	text	Number of sentences
<b>0</b>	1	when people hear ai they often think about sen...	19
<b>1</b>	2	with increasing computing power and more data ...	20
<b>2</b>	3	if you were a fan of the s film clueless back ...	39
<b>3</b>	5	from the stone age to the modern world from hu...	44
<b>4</b>	6	artificial intelligence ai is the development ...	37
...	...	...	...
<b>160</b>	167	can academia researchers decision makers and p...	42
<b>161</b>	168	introduction inventory planning is a fundament...	29
<b>162</b>	169	the problem insider threat detection specifica...	48
<b>163</b>	170	if we talk in terms of our general life exfilt...	22
<b>164</b>	171	some vendors fruit and vegetable sellers began...	21

165 rows × 3 columns

```
In [53]: df.head()
```

Out[53]:

	File	text	Number of sentences
<b>0</b>	1	when people hear ai they often think about sen...	19
<b>1</b>	2	with increasing computing power and more data ...	20
<b>2</b>	3	if you were a fan of the s film clueless back ...	39
<b>3</b>	5	from the stone age to the modern world from hu...	44
<b>4</b>	6	artificial intelligence ai is the development ...	37

```
In [54]: # Performing Sentiment Analysis
```

```
In [55]: guide = pd.read_csv('LoughranMcDonald_MasterDictionary_2020.csv')
guide.head()
```

Out[55]:

	Word	Seq_num	Word Count	Word Proportion	Average Proportion	Std Dev	Doc Count
0	AARDVARK	1	312	1.422050e-08	1.335201e-08	3.700747e-06	96
1	AARDVARKS	2	3	1.367356e-10	8.882163e-12	9.362849e-09	1
2	ABACI	3	9	4.102067e-10	1.200533e-10	5.359747e-08	7
3	ABACK	4	15	6.836779e-10	4.080549e-10	1.406914e-07	14
4	ABACUS	5	8009	3.650384e-07	3.798698e-07	3.523914e-05	1058

In [56]: `#Assigning +ve and -ve words based on the dictionary`

In [57]: `guide.shape`

Out[57]: (86531, 17)

In [62]:

```
positive = []
negative = []
uncertain = []

for index, row in guide.iterrows():
    if row['Positive'] > 0:
        positive.append(row['Word'].lower())
    if row['Negative'] > 0:
        negative.append(row['Word'].lower())
    if row['Uncertainty'] > 0:
        uncertain.append(row['Word'].lower())
```

In [63]: `df.head()`

Out[63]:

	File	text	Number of sentences
0	1	when people hear ai they often think about sen...	19
1	2	with increasing computing power and more data ...	20
2	3	if you were a fan of the s film clueless back ...	39
3	5	from the stone age to the modern world from hu...	44
4	6	artificial intelligence ai is the development ...	37

In [67]: `print(positive, "\n", negative, "\n", uncertain)`

['able', 'abundance', 'abundant', 'acclaimed', 'accomplish', 'accomplished', 'accomplishes', 'accomplishing', 'accomplishment', 'accomplishments', 'achieve', 'achieved', 'achievement', 'achievements', 'achieves', 'achieving', 'adequate', 'advancement', 'advancements', 'advances', 'advancing', 'advantage', 'advantaged', 'advantageous', 'advantageously', 'advantages', 'alliance', 'alliances', 'assure', 'assured', 'assures', 'assuring', 'attain', 'attained', 'attainment', 'attainments', 'attains', 'attractive', 'attractiveness', 'beautiful', 'beautifully', 'beneficially', 'benefited', 'benefiting', 'benefit', 'benefitting', 'best', 'better', 'bolstered', 'bolstering', 'bolsters', 'boom', 'booming', 'boost', 'boosted', 'breakthrough', 'breakthroughs', 'brilliant', 'charitable', 'collaborate', 'collaborated', 'collaborates', 'collaborating', 'collaboration', 'collaborations', 'collaborative', 'collaborator', 'collaborators', 'compliment', 'complimentary', 'complimented', 'complimenting', 'compliments', 'conclusive', 'conclusively', 'conducive', 'confident', 'constructive', 'constructively', 'courteous', 'creative', 'creatively', 'creativeness', 'creativity', 'delight', 'delighted', 'delightful', 'delightfully', 'delighting', 'delights', 'dependability', 'dependable', 'desirable', 'desired', 'despite', 'destined', 'diligent', 'diligently', 'distinction', 'distinctions', 'distinctive', 'distinctively', 'distinctiveness', 'dream', 'easier', 'easily', 'easy', 'efficiencies', 'efficiency', 'efficient', 'efficiently', 'empower', 'empowered', 'empowering', 'empowers', 'enable', 'enabled', 'enables', 'enabling', 'encouraged', 'encouragement', 'encourages', 'encouraging', 'enhance', 'enhanced', 'enhancement', 'enhancements', 'enhances', 'enhancing', 'enjoy', 'enjoyable', 'enjoyably', 'enjoyed', 'enjoying', 'enjoyment', 'enjoys', 'enthusiasm', 'enthusiastic', 'enthusiastically', 'excellence', 'excellent', 'excelling', 'excels', 'exceptional', 'exceptionally', 'excited', 'excitement', 'exciting', 'exclusive', 'exclusively', 'exclusiveness', 'exclusives', 'exclusivity', 'exemplary', 'fantastic', 'favorable', 'favorably', 'favored', 'favoring', 'favorite', 'favorites', 'friendly', 'gain', 'gained', 'gaining', 'gains', 'good', 'greatest', 'greatly', 'greatness', 'happiest', 'happily', 'happiness', 'happy', 'highest', 'honor', 'honored', 'honoring', 'honors', 'ideal', 'impress', 'impressed', 'impresses', 'impressing', 'impressive', 'impressively', 'improve', 'improved', 'improvement', 'improvements', 'improves', 'improving', 'incredible', 'incredibly', 'influential', 'informative', 'ingenuity', 'innovate', 'innovated', 'innovates', 'innovating', 'innovation', 'innovations', 'innovative', 'innovativeness', 'innovator', 'innovators', 'insightful', 'inspiration', 'inspirational', 'integrity', 'invent', 'invented', 'inventing', 'invention', 'inventions', 'inventive', 'inventiveness', 'inventor', 'inventors', 'leadership', 'leading', 'loyal', 'lucrative', 'meritorious', 'opportunities', 'opportunity', 'optimistic', 'outperform', 'outperformed', 'outperforming', 'outperforms', 'perfect', 'perfected', 'perfectly', 'perfects', 'pleasant', 'pleasantly', 'pleased', 'pleasure', 'plentiful', 'popular', 'popularity', 'positive', 'positively', 'preeminence', 'preeminent', 'premier', 'premiere', 'prestige', 'prestigious', 'proactive', 'proactively', 'proficiency', 'proficient', 'proficiently', 'profitability', 'profitable', 'profitably', 'progress', 'progressed', 'progresses', 'progressing', 'prospered', 'prospering', 'prosperity', 'prosperous', 'prospers', 'rebounds', 'rebounded', 'rebounding', 'receptive', 'regain', 'regained', 'regaining', 'resolve', 'revolutionize', 'revolutionized', 'revolutionizes', 'revolutionizing', 'reward', 'rewarded', 'rewarding', 'satisfaction', 'satisfactorily', 'satisfactory', 'satisfied', 'satisfies', 'satisfy', 'satisfying', 'smooth', 'smoothing', 'smoothly', 'smooths', 'solves', 'solving', 'spectacular', 'spectacularly', 'stability', 'stabilization', 'stabilizations', 'stabilize', 'stabilized', 'stabilizes', 'stabilizing', 'stable', 'strength', 'strengthen', 'strengthened', 'strengthening', 'strengthens', 'strengths', 'strong', 'stronger', 'stron

gest', 'succeed', 'succeeded', 'succeeding', 'succeeds', 'success', 'successe s', 'successful', 'successfully', 'superior', 'surpass', 'surpassed', 'surpassee s', 'surpassing', 'transparency', 'tremendous', 'tremendously', 'unmatched', 'unparalleled', 'unparalleled', 'unparalleled', 'upturn', 'upturns', 'valuable', 'versatile', 'versatility', 'vibrancy', 'vibrant', 'win', 'winner', 'winners', 'winning', 'worth y']

['abandon', 'abandoned', 'abandoning', 'abandonment', 'abandonments', 'abandon s', 'abdicated', 'abdicates', 'abdicating', 'abdication', 'abdication', 'aberrant', 'aberration', 'aberrational', 'aberrations', 'abetting', 'abnormal', 'abnormalities', 'abnormality', 'abnormally', 'abolish', 'abolished', 'abolishes', 'abolishing', 'abrogate', 'abrogated', 'abrogates', 'abrogating', 'abrogation', 'abrogations', 'abrupt', 'abruptly', 'abruptness', 'absence', 'absences', 'absteeism', 'abuse', 'abused', 'abuses', 'abusing', 'abusive', 'abusively', 'abusiveness', 'accident', 'accidental', 'accidentally', 'accidents', 'accusation', 'accusations', 'accuse', 'accused', 'accuses', 'accusing', 'acquiesce', 'acquiesced', 'acquiesces', 'acquiescing', 'acquit', 'acquits', 'acquittal', 'acquittals', 'acquitted', 'acquitting', 'adulterate', 'adulterated', 'adulterating', 'adulteration', 'adulterations', 'adversarial', 'adversaries', 'adversary', 'adverse', 'adversely', 'adversities', 'adversity', 'aftermath', 'aftermaths', 'against', 'aggravate', 'aggravated', 'aggravates', 'aggravating', 'aggravation', 'aggravations', 'alerted', 'alerting', 'alienate', 'alienated', 'alienates', 'alienating', 'alienation', 'alienations', 'allegation', 'allegations', 'allege', 'alleged', 'allegedly', 'alleges', 'alleging', 'annoy', 'annoyance', 'annoyances', 'annoyed', 'annoying', 'annoys', 'annul', 'annulled', 'annulling', 'annulment', 'annulments', 'annuls', 'anomalies', 'anomalous', 'anomalously', 'anomaly', 'anticompetitive', 'antitrust', 'argue', 'argued', 'arguing', 'argument', 'argumentative', 'arguments', 'arrearage', 'arrearages', 'arrears', 'arrest', 'arrested', 'arrests', 'artificially', 'assault', 'assaulted', 'assaulting', 'assaults', 'assertions', 'attrition', 'aversely', 'backdating', 'bad', 'bail', 'bailout', 'balk', 'balked', 'bankrupt', 'bankruptcies', 'bankruptcy', 'bankrupted', 'bankrupting', 'bankrupts', 'bans', 'barred', 'barrier', 'barriers', 'bottleneck', 'bottlenecks', 'boycott', 'boycotted', 'boycotting', 'boycotts', 'breach', 'breached', 'breaches', 'breaching', 'break', 'breakage', 'breakages', 'breakdown', 'breakdowns', 'breaks', 'bribe', 'bribed', 'briberies', 'bribery', 'bribes', 'bribing', 'burden', 'burdened', 'burdening', 'burdens', 'burdensome', 'burned', 'calamities', 'calamitous', 'calamity', 'cancel', 'canceled', 'canceling', 'cancellation', 'cancellations', 'cancelled', 'canceling', 'cancells', 'careless', 'carelessly', 'carelessness', 'catastrophe', 'catastrophes', 'catastrophic', 'catastrophically', 'caution', 'cautionary', 'cautioned', 'cautio ning', 'cautions', 'cease', 'ceased', 'ceases', 'ceasing', 'censure', 'censure d', 'censures', 'censuring', 'challenge', 'challenged', 'challenges', 'challenging', 'chargeoffs', 'circumvent', 'circumvented', 'circumventing', 'circumvention', 'circumventions', 'circumvents', 'claiming', 'claims', 'clawback', 'closeout', 'closeouts', 'closings', 'closure', 'closures', 'coerce', 'coerced', 'coerces', 'coercing', 'coercion', 'coercive', 'collapse', 'collapsed', 'collapses', 'collapsing', 'collision', 'collisions', 'collude', 'colluded', 'colludes', 'colluding', 'collusion', 'collusions', 'collusive', 'complain', 'complained', 'complaining', 'complains', 'complaint', 'complaints', 'complicate', 'complicated', 'complicates', 'complicating', 'complication', 'complications', 'compulsion', 'concealed', 'concealing', 'concede', 'conceded', 'concedes', 'conceding', 'concern', 'concerned', 'concerns', 'conciliating', 'conciliation', 'conciliations', 'condemn', 'condemnation', 'condemnations', 'condemned', 'condemning', 'condemns', 'condone', 'condoned', 'confess', 'confessed', 'confesses', 'confessing', 'confession', 'confine', 'confined', 'confinement', 'confinements', 'confi

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[ 'abeyance', 'abeyances', 'almost', 'alteration', 'alterations', 'ambiguities', 'ambiguity', 'ambiguous', 'anomalies', 'anomalous', 'anomalously', 'anomaly', 'anticipate', 'anticipated', 'anticipates', 'anticipating', 'anticipation', 'anticipations', 'apparent', 'apparently', 'appear', 'appeared', 'appearing', 'appears', 'approximate', 'approximated', 'approximately', 'approximates', 'approximating', 'approximation', 'approximations', 'arbitrarily', 'arbitrariness', 'arbitrary', 'assume', 'assumed', 'assumes', 'assuming', 'assumption', 'assumptions', 'believe', 'believed', 'believes', 'believing', 'cautious', 'cautiously', 'cautiousness', 'clarification', 'clarifications', 'conceivable', 'conceivably', 'conditional', 'conditionally', 'confuses', 'confusing', 'confusingly', 'confusion', 'contingencies', 'contingency', 'contingent', 'contingently', 'contingents', 'could', 'crossroad', 'crossroads', 'depend', 'depended', 'dependency', 'dependencies', 'dependency', 'dependent', 'depending', 'depends', 'destabilizing', 'deviate', 'deviated', 'deviates', 'deviating', 'deviation', 'deviations', 'differ', 'differed', 'differing', 'differs', 'doubt', 'doubted', 'doubtful', 'doubts', 'exposure', 'exposures', 'fluctuate', 'fluctuated', 'fluctuates', 'fluctuating', 'fluctuation', 'fluctuations', 'hidden', 'hinges', 'imprecise', 'imprecision', 'imprecisions', 'improbability', 'improbable', 'incompleteness', 'indefinite', 'indefinitely', 'indefiniteness', 'indeterminable', 'indeterminateness', 'inexact', 'inexactness', 'instabilities', 'instability', 'intangible', 'in-

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```
In [68]: def positivescore(text):
    score = 0
    global positive
    words = text.split()
    score = sum(1 for word in words if word in positive)
    return score

def negativescore(text):
    score = 0
    global negative
    words = text.split()
    score = sum(1 for word in words if word in negative)
    return score
```

```
In [69]: df["Positive Score"] = df['text'].apply(positivescore)
df["Negative Score"] = df['text'].apply(negativescore)
```

```
In [70]: df.head()
```

Out[70]:

	File	text	Number of sentences	Positive Score	Negative Score
0	1	when people hear ai they often think about sen...	19	4	7
1	2	with increasing computing power and more data ...	20	8	6
2	3	if you were a fan of the s film clueless back ...	39	34	19
3	5	from the stone age to the modern world from hu...	44	21	17
4	6	artificial intelligence ai is the development ...	37	16	12

In [72]:

```
df['POLARITY SCORE'] = (df['Positive Score'] - df['Negative Score']) / (
    df['Positive Score'] + df['Negative Score']) + 0.000001
)

df['WORD COUNT'] = df['text'].apply(lambda x: len(x.split()))

df['SUBJECTIVITY SCORE'] = (df['Positive Score'] + df['Negative Score']) / (
    df['WORD COUNT'] + 0.000001
)

df['AVG SENTENCE LENGTH'] = df['WORD COUNT'] / df['Number of sentences']

df['AVG NUMBER OF WORDS PER SENTENCE'] = df['WORD COUNT'] / df['Number of sent
```

In [73]:

```
df.head()
```

Out[73]:

	File	text	Number of sentences	Positive Score	Negative Score	Polarity Score	Word Count	Subject S
0	1	when people hear ai they often think about sen...	19	4	7	-0.272727	726	0.0
1	2	with increasing computing power and more data ...	20	8	6	0.142857	639	0.0
2	3	if you were a fan of the s film clueless back ...	39	34	19	0.283019	1860	0.0
3	5	from the stone age to the modern world from hu...	44	21	17	0.105263	1251	0.0
4	6	artificial intelligence ai is the development ...	37	16	12	0.142857	1134	0.0

In [75]:

```
# for average word length
def avg_word_length(text):
    words = text.split()
    if len(words) == 0:
        return 0
    return sum(len(word) for word in words) / len(words)
```

In [78]:

```
## for seeing if the sentence has pronoun
def pronoun(text):
    pronouns = r"(\b(s?i|me|we|my|ours|us|I|Me|We|My|Ours|Us)\b)"
    result = 0

    matches = re.finditer(pronouns, text, re.MULTILINE)
    for nummatch, match in enumerate(matches):
        result+=1
    return result
```

In [81]:

```
df['AVG WORD LENGTH'] = df['text'].apply(avg_word_length)
df['AVG SENTENCE LENGTH'] = df['WORD COUNT'] / df['Number of sentences']
df['PERSONAL PRONOUNS'] = df['text'].apply(pronoun)
```

```
In [82]: df['URL']=links['URL']
df.columns
```

```
Out[82]: Index(['File', 'text', 'Number of sentences', 'Positive Score',
       'Negative Score', 'POLARITY SCORE', 'WORD COUNT', 'SUBJECTIVITY SCOR
E',
       'AVG SENTENCE LENGTH', 'AVG NUMBER OF WORDS PER SENTENCE',
       'AVG WORD LENGTH', 'PERSONAL PRONOUNS', 'URL'],
      dtype='object')
```

```
In [85]: df = df[['URL',
                 'File',
                 'text',
                 'Number of sentences',
                 'Positive Score',
                 'Negative Score',
                 'POLARITY SCORE',
                 'WORD COUNT',
                 'SUBJECTIVITY SCORE',
                 'AVG SENTENCE LENGTH',
                 'AVG NUMBER OF WORDS PER SENTENCE',
                 'AVG WORD LENGTH',
                 'PERSONAL PRONOUNS']]
```

```
In [86]: df.head()
```

Out[86] :

		URL	File	text	Number of sentences	Positive Score	Negative Score
0	https://insights.blackcoffer.com/how-is-login...		1	when people hear ai they often think about sen...	19	4	7
1	https://insights.blackcoffer.com/how-does-ai-h...		2	with increasing computing power and more data ...	20	8	6
2	https://insights.blackcoffer.com/ai-and-its-im...		3	if you were a fan of the s film clueless back ...	39	34	19
3	https://insights.blackcoffer.com/how-do-deep-l...		5	from the stone age to the modern world from hu...	44	21	17
4	https://insights.blackcoffer.com/how-artificia...		6	artificial intelligence ai is the development ...	37	16	12

In [ ]: