ex2

March 8, 2025

[23]:
```
import re
import pandas as pd
import matplotlib.pyplot as plt
import time
import random
from selenium import webdriver
from selenium.webdriver.firefox.options import Options
from selenium.webdriver.common.keys import Keys
from selenium.webdriver.common.by import By
from selenium.common.exceptions import NoSuchElementException,␣
↪ElementClickInterceptedException
```

[24]:
```
# clear csv
f = open('data/scrapedLinks_bbc.csv', "w+")
f.close()
```

1 Part 1: Analyze the Fake News Dataset

1.1 1.1: Import dataset from Ex 1

[25]:
```
#load data
dataPath = "data/"
Cleaned_data = pd.read_csv(dataPath + "cleanedData.csv")
```

1.2 1.2 Dataset Analysis

1.2.1 Determine which article types should be omitted, if any.

[26]:
```
typelist = Cleaned_data['type'].unique()
print(typelist)
```

```
['unreliable' 'fake' 'clickbait' 'conspiracy' 'reliable' 'bias' 'hate'
 'junksci' 'political' nan 'unknown']
```

Assuming that the data will be used to train a classifier such as the one in the course project, there are some types that should be omitted. These are the ones that are note certainly either fake or reliable. If a type cant be given one of our two labels they cannot be used for training.

Unknown: If we dont know the article type, it cant be placed in either label.

nan: Omitted for same reason as unknown

Unreliable: The documentation describes it as "Sources that may be reliable but whose contents

[27]:
```
Cleaned_data = Cleaned_data.dropna(subset=['type'])
Cleaned_data = Cleaned_data.loc[Cleaned_data['type']!='unknown']
Cleaned_data = Cleaned_data.loc[Cleaned_data['type']!='unreliable']
```

[28]:
```
# Get the counts for each unique type
type_counts = Cleaned_data['type'].value_counts()

# Print the counts
for types, count in type_counts.items():
    print(types, ":", count)
```

```
fake : 155
conspiracy : 31
political : 23
bias : 6
junksci : 6
reliable : 3
clickbait : 1
hate : 1
```

1.2.2 Group the remaining types into 'fake' and 'reliable'. Argue for your choice.

1.2.3 Fake

Fake
Conspiracy
Bias
Junksci
Hate

From the documentaion it can be seen that Conspiracy, Hate, bias and junksci are mostly made up either of statements misrepresenting fact or of content that is either highly biased by or entirely based on belief. In either case content that is not backed by science or fact. Fake is fake

1.2.4 Reliable

Political
Reliable
Clickbait

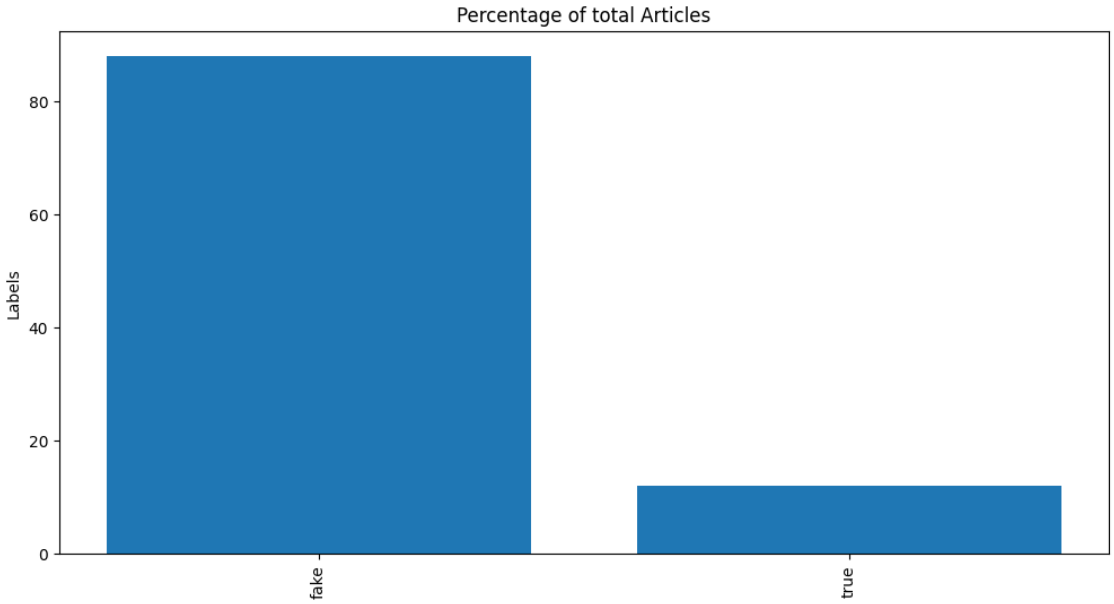
Political and Clickbait are both described as generally reliable, with slight bias or inaccuracy. Reliable is reliable.

[ ]:
```
# groups (reliable, political and clickbait) as truenews 1 and (all others) in␣
↪fakenews 0
   #note this is naive and should be reconsidered later
Cleaned_data['type'] = Cleaned_data['type'].replace({'^reliable$': '1',␣
↪'^political$': '1', '^clickbait$': '1'}, regex=True)
Cleaned_data['type'] = Cleaned_data['type'].replace(r'^(?!1$).+', '0',␣
↪regex=True)   # Replace everything except '1' with '0'
```

1.2.5 Examine the percentage distribution of 'reliable' vs. 'fake' articles. Is the dataset balanced? Discuss the importance of a balanced distribution.

[30]:
```
# Get the counts for each unique type
countFake, countReliable = Cleaned_data['type'].value_counts()
countTotal = countFake + countReliable

labels = ['fake', 'true']
PercentageValues = [countFake / countTotal * 100, countReliable / countTotal *␣
↪100]

percentage_df = pd.DataFrame({
    'Type': labels,
    'Percentage': PercentageValues
})
```

[31]:
```
fig, ax = plt.subplots(figsize=(12, 6))

ax.bar(percentage_df['Type'], percentage_df['Percentage'], color= 'tab:blue')

ax.set_ylabel('Labels')
ax.set_title('Percentage of total Articles')
plt.xticks(rotation=90)

plt.show()
print('fake percentage:',countFake / countTotal * 100)
print('reliable percentage:',countReliable / countTotal * 100)
print('relation:', countFake / countReliable)
```




```
fake percentage: 88.05309734513274
reliable percentage: 11.946902654867257
relation: 7.37037037037037
```

The data is highly unbalanced in favor of fake articles, with a ratio of approximately 1:7. For a model to effectively learn the distinguishing features of each class, it is beneficial to expose it to an even distribution of both classes. In cases like ours, where one class dominates the data, a model trained on such an imbalanced dataset may become biased. It could overfit by learning the statistical advantage of predicting the majority class, rather than learning the distinct features that differentiate both classes. As a result, the model might predict the majority class disproportionately, regardless of the content, and fail to accurately identify the minority class.

2 Part 2: Gathering Links

2.1 2.1: Install Library

dddddonneeee

2.2 2.2: Retrieve HTML Content

[ ]:
```
options = Options()
options.add_argument("-profile")
options.add_argument("/home/andreas-linus-thalund-midtgaard/snap/firefox/common/
 ↪.mozilla/firefox/kao2pljk.default")   #replace with path on you setup

#had some troubles with library. Above turned out to be necessary

browser = webdriver.Firefox(options=options)
```

```
browser.get("https://www.bbc.com/news/world/europe")

#get html
html = browser.page_source
time.sleep(2)
print(html)

# close web browser
browser.close()
```

```
<html lang="en-GB"><head><meta charset="utf-8"><meta name="viewport"
content="width=device-width"><title>Europe | Latest News &amp; Updates | BBC
News</title><meta property="og:title" content="Europe | Latest News &amp;
Updates | BBC News"><meta name="twitter:title" content="Europe | Latest News
&amp; Updates | BBC News"><meta name="description" content="Get all the latest
news, live updates and content about Europe from across the BBC."><meta
property="og:description" content="Get all the latest news, live updates and
content about Europe from across the BBC."><meta name="twitter:description"
content="Get all the latest news, live updates and content about Europe from
across the BBC."><meta name="msapplication-TileColor" content="#da532c"><meta
name="theme-color" content="#ffffff"><meta name="robots" content="NOODP,
NOYDIR"><meta name="apple-itunes-app" content="app-id=364147881, app-
argument=https://www.bbc.com/news/world/europe"><link rel="apple-touch-icon"
sizes="180x180" href="/bbcx/apple-touch-icon.png"><link rel="icon"
type="image/png" sizes="32x32" href="/bbcx/favicon-32x32.png"><link rel="icon"
type="image/png" sizes="16x16" href="/bbcx/favicon-16x16.png"><link
rel="alternate icon" href="/bbcx/favicon.ico"><link rel="manifest"
href="/bbcx/site.webmanifest"><link rel="mask-icon" href="/bbcx/safari-pinned-
tab.svg" color="#000000"><link rel="canonical"
href="https://www.bbc.com/news/world/europe"><link data-testid="en-hreflang-tag"
rel="alternate" hreflang="en" href="https://www.bbc.com/news/world/europe"><link
data-testid="en-gb-hreflang-tag" rel="alternate" hreflang="en-gb"
href="https://www.bbc.co.uk/news/world/europe"><meta name="version"
content="2.16.1+2"><script type="application/ld+json">{"@context":"http://schema
.org","@type":"WebPage","description":"Get all the latest news, live updates and
content about Europe from across the BBC.","url":"https://www.bbc.com/news/world
/europe","mainEntityOfPage":"https://www.bbc.com/news/world/europe","publisher":
{"@type":"NewsMediaOrganization","name":"BBC
News","logo":"https://m.files.bbci.co.uk/modules/bbc-morph-news-waf-page-meta/5.
3.0/bbc_news_logo.png","publishingPrinciples":"https://www.bbc.co.uk/news/help-4
1670342"},"name":"Europe | Latest News & Updates | BBC News"}</script><meta
property="al:ios:url" content="bbcx://news/world/europe"><meta
property="al:ios:app_store_id" content="364147881"><meta
property="al:ios:app_name" content="BBC: World News &amp; Stories"><meta
property="al:android:url" content="bbcx://news/world/europe"><meta
property="al:android:app_name" content="BBC: World News &amp; Stories"><meta
property="al:android:package" content="bbc.mobile.news.ww"><meta
```

```
    window._cbq = (window._cbq || ["_acct","anon"]);
  </script><script src="https://static.chartbeat.com/js/chartbeat.js"
async="true" id="chartbeat" type="text/javascript" data-
nscript="afterInteractive"></script><script src="https://uk-
script.dotmetrics.net/door.js?d=www.bbc.com&amp;t=newsstudio"
async=""></script><next-route-announcer><p aria-live="assertive" id="__next-
route-announcer__" role="alert" style="border: 0px; clip: rect(0px, 0px, 0px,
0px); height: 1px; margin: -1px; overflow: hidden; padding: 0px; position:
absolute; width: 1px; white-space: nowrap; overflow-wrap: normal;"></p></next-
route-announcer><iframe
src="https://a4621041136.cdn.optimizely.com/client_storage/a4621041136.html"
hidden="" tabindex="-1" title="Optimizely Internal Frame" style="display: none;"
height="0" width="0"></iframe><div><div id="ngasCookiePrompt"><div
id="cookiePrompt"
style="position:fixed;bottom:0;z-index:999;width:100%;"><section
class="bbccookies-banner"><div class="b-g-p b-g-m orb-banner-wrapper
bbccookies-d"><div id="bbccookies" style="display: inline-
block;width:100%;"><div id="bbccookies-prompt" class="orb-banner b-r"><h2
class="orb-banner-title"><span>Let us know you agree to cookies</span></h2><div
class="orb-banner-content"><p dir="ltr">We use <a
href="https://www.bbc.com/usingthebbc/cookies/what-do-i-need-to-know-about-
cookies/">cookies</a> to give you the best online experience. </p><p
dir="ltr">Please let us know if you agree to all of these cookies. </p></div><ul
class="orb-banner-options"><li><button type="button" id="bbccookies-continue-
button" class="continue-button banner-button"><span>Yes, I
agree</span></button></li><li id="bbccookies-settings"><a
href="https://www.bbc.com/usingthebbc/cookies/how-can-i-change-my-bbc-cookie-
settings/" class="banner-button"><span>No, take me to settings</span></a></li></
ul></div></div></div></section></div></div></div><iframe style="display: none;"
name="__tcfapiLocator"></iframe><iframe style="display: none;"
name="__uspapiLocator"></iframe><iframe style="display: none;"
name="__gppLocator"></iframe><iframe marginwidth="0" marginheight="0"
scrolling="no" frameborder="0" id="10756d79bcaada" width="0" height="0"
src="about:blank" style="display: none; height: 0px; width: 0px; border: 0px;"
name="__pb_locator__"></iframe></body></html>
```


2.3 2.3 Extract Articles

[33]:
```
def extractArticle():
    unique_articles = set()
    browser = webdriver.Firefox(options=options)
    browser.get("https://www.bbc.com/news/world/europe")
    time.sleep(2)

    #find link class containing headlines and summaries (articles)
    articles = browser.find_elements(By.XPATH, "//a[count(.//h2) = 1 and .//p]")
```

```
    #Extract links, headlines and summaries from articles
    for article in articles:

        h2_element = article.find_element(By.XPATH, ".//h2")
        headline = h2_element.text.strip()

        p_element = article.find_element(By.XPATH, ".//p")
        summary = p_element.text.strip()

        link = article.get_attribute("href")

        # Convert relative links to absolute
        if link and link.startswith("/"):
            link = "https://www.bbc.com" + link

        #ensure no dublicates
        if not headline or not summary or not link:
            continue
        article_tuple = (headline, summary, link)
        if article_tuple not in unique_articles:
            unique_articles.add(article_tuple)
            print("\nArticle:")
            print("  Headline:", headline)
            print("  Summary:", summary)
            print("  Link:", link)




    browser.quit()
```

[34]:
```
extractArticle()
```

```
Article:
  Headline: Paris trains halted and area evacuated after WW2 bomb found
  Summary: The unexploded bomb was found on tracks near the station, with all
Paris trains, plus Eurostar to Brussels, suspended.
  Link: https://www.bbc.com/news/articles/cvg13rmnvzvo

Article:
  Headline: Hundreds evacuated at site of WW2 bomb after Eurostar cancels all
Paris trains
  Summary: Police have blocked rail services to and from Gare du Nord after an
unexploded device was found on the tracks in the Saint-Denis district.
  Link: https://www.bbc.com/news/live/cz61257gnjqt
```

2.4 2.4 & 2.5: Web Scraping - Links

Function that scrapes the links for each article on all pages for all regions and saves to disk.

[ ]:
```
def scrapeTheBBC():
    browser = webdriver.Firefox(options=options)
    browser.get("https://www.bbc.com/news/world/europe")
    time.sleep(1)

    articleLinks = set()

    linksToTheWorld = [
        "/news/us-canada",
        "/news/uk",
        "/news/world/africa",
        "/news/world/asia",
        "/news/world/australia",
        "/news/world/latin_america",
        "/news/world/middle_east"
    ]

    for worldlink in linksToTheWorld:
        while True:
                #scroll to bottom so paginator is loaded
                browser.execute_script("window.scrollTo(0, document.body.
 ↪scrollHeight);")
                time.sleep(2)



                #scrape data
                #find link class containing headlines and summaries (articles)
                articles = browser.find_elements(By.XPATH, "//a[count(.//h2) =␣
 ↪1 and .//p]")

                #extract link
                for article in articles:
                    h2_element = article.find_element(By.XPATH, ".//h2")
                    headline = h2_element.text.strip()

                    p_element = article.find_element(By.XPATH, ".//p")
                    summary = p_element.text.strip()

                    link = article.get_attribute("href")

                    # Convert relative links to absolute
                    if link and link.startswith("/"):
                        link = "https://www.bbc.com" + link
```

```
                    #ensure no dublicates
                    if not headline or not summary or not link:
                        continue

                    #sorting out non-articles
                    #if "/sport/" in link or "/videos/" in link:
                    #    continue

                    if link not in articleLinks:
                        articleLinks.add(link)
                        print("\nArticle:")
                        print("  Headline:", headline)
                        print("  Summary:", summary)
                        print("  Link:", link)


                #find "next page" button and break loop if it does not exist or␣
↪is dissabelled
                next_buttons = browser.find_elements(By.XPATH, "//
↪button[@data-testid='pagination-next-button']")
                if not next_buttons:
                    break

                next_button = next_buttons[0]
                if not next_button.is_enabled():
                    break

                #go to next page
                next_buttons[0].click()
                time.sleep(2)


        region_url = "https://www.bbc.com" + worldlink
        browser.get(region_url)  # Navigate to the next region page
        time.sleep(3)  # Allow the page to load


    # close web browser
    browser.quit()
    return articleLinks
```

[46]:
```
scraped_linksbbc = scrapeTheBBC()
```

```
Article:
  Headline: Paris trains halted and area evacuated after WW2 bomb found
```

```
  Link: https://www.bbc.com/news/articles/cly0jzekw84o

Article:
  Headline: Brazil first lady uses expletive against Elon Musk at G20 event
  Summary: Janja Lula da Silva joked that she was not afraid of the owner of
social media platform X.
  Link: https://www.bbc.com/news/articles/cwy1693xwlzo

Article:
  Headline: Venezuela frees more than 100 arrested after disputed election
result
  Summary: More than 100 political prisoners caught up in a post-election
crackdown have been released, according to a human rights group.
  Link: https://www.bbc.com/news/articles/c5yx5qzzypgo
```

[ ]:
```
scrapedLinks_BBC = scraped_linksbbc

scrapedLinks_BBC_df = pd.DataFrame(list(scrapedLinks_BBC), columns=['Links'])

#sorting out remaining non-articles
#scrapedLinks_BBC_df = scrapedLinks_BBC_df[scrapedLinks_BBC_df['Links'].str.
 ↪contains('/articles/')]

#save results in csv

scrapedLinks_BBC_df.to_csv('data/scrapedLinks_bbc.csv', index=False)
```

[64]:
```
print(scrapedLinks_BBC_df)
```

```
                                                 Links
0    https://www.bbc.com/news/world-latin-america-2…
1       https://www.bbc.com/news/articles/cgj5819dnpqo
2       https://www.bbc.com/news/articles/crlxz41jxw2o
3       https://www.bbc.com/news/articles/c9d5zqg3228o
4       https://www.bbc.com/news/articles/cnvqle40183o
..                                                  …
754       https://www.bbc.com/news/videos/cn4yzywpy72o
755       https://www.bbc.com/news/videos/c33715jp6n4o
756       https://www.bbc.com/news/videos/c0q184n7qnjo
757     https://www.bbc.com/news/articles/cvg8lnnge8po
758     https://www.bbc.com/news/articles/cvgxz76m1g8o

[759 rows x 1 columns]
```

about 800..

3 Part 3: Scraping Article Text

3.1 3.1: Article Inspection

There is and article tag, and the first h1 tag after this seems to be the headline.

Any p tags withing article tag seem to contain only text.

The first instance of time tag indicatesthe published date

and the author can be found by the simple rule of: Author= //*[@id=”main-content”]/article/div[2]/div/div[2]/div/div/span

3.2 3.2: Scraping function given link

Function that takes a URL and returns a dictionary with the articles content

[59]:
```
scrapedLinks_BBC_df = pd.read_csv(dataPath + "scrapedLinks_bbc.csv")
```

[61]:
```
#user is responsible for creating and closing browser
def scrapeText(link):
    browser.get(link)
    time.sleep(2)

    # Extracting content
    try:
        headline = browser.find_element(By.XPATH, "//article//h1").text
    except NoSuchElementException:
        headline = "n/a"
    try:
        published_date = browser.find_element(By.XPATH, "//article//time").
 ↪get_attribute("datetime")
    except NoSuchElementException:
        published_date = "n/a"
    try:
        author = browser.find_element(By.XPATH, '//*[@id="main-content"]/
 ↪article/div[2]/div/div[2]/div/div/span').text
    except NoSuchElementException:
        author = "n/a"
    try:
        article_paragraphs = browser.find_elements(By.XPATH, "//article//p")
        article_text = "\n".join([p.text for p in article_paragraphs])
    except NoSuchElementException:
        article_text = "n/a"


    #creating article dict
    article = {
        "Content": article_text,
        "Published": published_date,
```

```
        "Title": headline,
        "Author": author

    }

    return article
```

[62]:
```
options = Options()
options.add_argument("-profile")
options.add_argument("/home/andreas-linus-thalund-midtgaard/snap/firefox/common/
 ↪.mozilla/firefox/kao2pljk.default")  # Replace with your actual profile path

browser = webdriver.Firefox(options=options)
print(scrapeText(scrapedLinks_BBC_df.iloc[1]["Links"]))
browser.quit()
```

```
{'Content': 'Actor Morgan Freeman has led tributes at the annual Academy Awards
ceremony to fellow Hollywood star Gene Hackman, whose death last month is under
police investigation.\n"This week, our community lost a giant and I lost a dear
friend," said Freeman, who worked with Hackman in two films, including 1992\'s
Unforgiven, which won Hackman his second Oscar.\n"Like everyone who ever shared
a scene with him I learned he was a generous performer whose gifts elevated
everyone\'s work," Freeman said.\nHackman, 95, and his wife Betsy Arakawa, 65,
were found dead at their home in New Mexico days ago.\n"He received two Oscars
but more importantly he won the hearts of film-lovers all over the world,"
Freeman said in his speech during Sunday night\'s 97th Academy Awards ceremony
in Los Angeles.\nHe added that Hackman had told him: "I don\'t think about
legacy, I just hope people remember me as someone who tried to do good
work."\n"Gene, you\'ll be remembered for that and so much more. Rest in peace,
my friend."\nMorgan, 87, also starred alongside Hackman in 2000 film Under
Suspicion.\nThe Oscars ceremony also featured an in memoriam segment, where
clips from some of the character actor\'s best films over his 60-year career
were shown.\nHackman was known for such movies as The French Connection, The
Conversation, Bonnie and Clyde, Mississippi Burning and Superman, but had not
starred in a film since his retirement from acting in 2004.\nOfficials found
Hackman and Ms Arakawa\'s bodies on Wednesday, about 10 days after investigators
believe he died.\nThe results of a post-mortem examination are pending, and
officials say it may take weeks to determine how the couple died.\nThe Oscars
ceremony also featured a tribute to music producer Quincy Jones, led by Whoopi
Goldberg, Oprah and Queen Latifah, who sang a song in his memory.\nJones
received seven Oscar nominations in in his lifetime, including in 1967 when he
became the first black composer to be nominated for the original song
category.\nJones died in November at the age of 91.', 'Published':
'2025-03-03T04:14:20.835Z', 'Title': "Morgan Freeman leads Oscars tribute to
'dear friend' Gene Hackman", 'Author': 'Max Matza'}
```

3.3 3.3 & 3.4: Scrape articles from all links and save the data to disc

[71]:
```
scrapedArticles_df = pd.DataFrame({'Content': [], 'Published': [], 'Title': [],␣
 ↪'Author': []})
```

[72]:
```
# clear csv
f = open('data/scrapedContent_bbc.csv', "w+")
f.close()
```

[ ]:
```
options = Options()
options.add_argument("-profile")
options.add_argument("/home/andreas-linus-thalund-midtgaard/snap/firefox/common/
 ↪.mozilla/firefox/kao2pljk.default")  # Replace with your actual profile path

browser = webdriver.Firefox(options=options)

for i in range (120, len(scrapedLinks_BBC_df)):
    #attempt to scrape article
    try:
        scrapedArticles_df = pd.concat([scrapedArticles_df, pd.
 ↪DataFrame([scrapeText(scrapedLinks_BBC_df.iloc[i]["Links"])])],␣
 ↪ignore_index=True)

    #error handling for debugging
    except:
        print("stopped at:", i, scrapeText(scrapedLinks_BBC_df.
 ↪iloc[i]["Links"]))
        scrapedLinks_BBC_df.iloc[i].to_csv('data/synder_bbc.csv', index=False)
        scrapedArticles_df.to_csv('data/scrapedContent_bbc.csv', index=False)
        break

    #save progress every ten article
    if i % 10 == 0:
        scrapedArticles_df.to_csv('data/scrapedContent_bbc.csv', index=False)
        print(f"Saved progress at {i} articles.")
    # Delay --- although bbc doesńt explicitly state a max request rate (https:/
 ↪/www.bbc.com/robots.txt)
    delay = random.uniform(2, 5)
    time.sleep(delay)

browser.quit()

#save to csv
scrapedArticles_df.to_csv('data/scrapedContent_bbc.csv', index=False)
```

```
Saved progress at 120 articles.
Saved progress at 130 articles.
```

```
Saved progress at 140 articles.
Saved progress at 150 articles.
Saved progress at 160 articles.
Saved progress at 170 articles.
Saved progress at 180 articles.
Saved progress at 190 articles.
Saved progress at 200 articles.
Saved progress at 210 articles.
Saved progress at 220 articles.
Saved progress at 230 articles.
Saved progress at 240 articles.
Saved progress at 250 articles.
Saved progress at 260 articles.
Saved progress at 270 articles.
Saved progress at 280 articles.
Saved progress at 290 articles.
Saved progress at 300 articles.
Saved progress at 310 articles.
Saved progress at 320 articles.
Saved progress at 330 articles.
Saved progress at 340 articles.
Saved progress at 350 articles.
Saved progress at 360 articles.
Saved progress at 370 articles.
Saved progress at 380 articles.
Saved progress at 390 articles.
Saved progress at 400 articles.
Saved progress at 410 articles.
Saved progress at 420 articles.
Saved progress at 430 articles.
Saved progress at 440 articles.
Saved progress at 450 articles.
Saved progress at 460 articles.
Saved progress at 470 articles.
Saved progress at 480 articles.
Saved progress at 490 articles.
Saved progress at 500 articles.
Saved progress at 510 articles.
Saved progress at 520 articles.
Saved progress at 530 articles.
Saved progress at 540 articles.
Saved progress at 550 articles.
Saved progress at 560 articles.
Saved progress at 570 articles.
Saved progress at 580 articles.
Saved progress at 590 articles.
Saved progress at 600 articles.
Saved progress at 610 articles.
```

```
Saved progress at 620 articles.
Saved progress at 630 articles.
Saved progress at 640 articles.
Saved progress at 650 articles.
Saved progress at 660 articles.
Saved progress at 670 articles.
Saved progress at 680 articles.
Saved progress at 690 articles.
Saved progress at 700 articles.
Saved progress at 710 articles.
Saved progress at 720 articles.
Saved progress at 730 articles.
Saved progress at 740 articles.
Saved progress at 750 articles.
```

Failed at 120: ReadTimeoutError

3.4 3.5: Will it make sense to include this data in the project?

The BBC is generally considered a trustworthy source, but without fact-checking each of the 600+ articles individually, we cannot be certain of their accuracy. Even in the best of cases reliable news sources can occasionally produce politically biased or clickbait content. This would not be the biggest issue as we have still chosen to classify these as reliable. In the worst case however, our assumption of total reliability is entirely incorrect, in which case we risk training our model on mislabeled data, leading to skewed results. Thus there is also a clear reason for why including this new data may be unwise.

[76]:
```
n_a_counts = (scrapedArticles_df == "n/a").sum()
print(n_a_counts)
```

```
Content        0
Published     93
Title         93
Author       178
dtype: int64
```

There seems to be a noninsignificant amount of empty entries. This is most likely due to the scraper being written for bbc articles. Therefore pages that fall outside of this (like videos or sport) are most likely not scraped correctly. (could also be due to lows in network speed making pages not load entirely, a possibility supported by the timeouterror)