Importing the required libraries to perform the analyses on the articles:

```
In [113]:
# import needed libraries
# needed for directory access
import os
import nltk
import pandas as pd
import nltk.corpus
import matplotlib.pyplot as plot
from nltk.probability import FreqDist

# get and set your working directory
os.getcwd()
os.chdir('/Users/Public')
os.getcwd()
```

```
Out[113]: 'C:\\Users\\Public'
```

Loading the text file from the set directory:

```
In [3]:
# Article - 1: Israel leverages Russia ties to try to mediate between West and Putin. Will it work?
# reading the text file

textfile_1 = open('Article_1.txt', encoding='utf8')
Article_1 = textfile_1.read()
print(Article_1)
```

```
Israel leverages Russia ties to try to mediate between West and Putin. Will it work?
“Israel can’t afford to be seen as not standing by a democracy that is fighting for its freedom,” a former ambassador to
Washington said.
JERUSALEM – On the surface, it seems like a doomed diplomatic gambit – the untested leader of Israel, which is known for
its unresolved conflict with the Palestinians and wars with its neighbors, tries to help end the most serious combat in E
urope since the end of World War II.

That’s what happened when Prime Minister Naftali Bennett flew to Moscow on Feb. 26, a Saturday, two days after Russia inv
aded Ukraine, despite being an observant Jew for whom travel on the Sabbath is forbidden unless it’s a matter of life and
death.

JERUSALEM – On the surface, it seems like a doomed diplomatic gambit – the untested leader of Israel, which is known for
its unresolved conflict with the Palestinians and wars with its neighbors, tries to help end the most serious combat in E
urope since the end of World War II.

That’s what happened when Prime Minister Naftali Bennett flew to Moscow on Feb. 26, a Saturday, two days after Russia inv
aded Ukraine, despite being an observant Jew for whom travel on the Sabbath is forbidden unless it’s a matter of life and
death.
```

Separating the words in the article into tokens:

```
In [4]: from nltk.tokenize import RegexpTokenizer
        tokenizer_1 = RegexpTokenizer(r'\w+')
        token_results_1 = tokenizer_1.tokenize(Article_1)
        print(token_results_1)
```

```
['Israel', 'leverages', 'Russia', 'ties', 'to', 'try', 'to', 'mediate', 'between', 'West', 'and', 'Putin', 'Will', 'it',
'work', 'Israel', 'can', 't', 'afford', 'to', 'be', 'seen', 'as', 'not', 'standing', 'by', 'a', 'democracy', 'that', 'i
s', 'fighting', 'for', 'its', 'freedom', 'a', 'former', 'ambassador', 'to', 'Washington', 'said', 'JERUSALEM', 'On', 'th
e', 'surface', 'it', 'seems', 'like', 'a', 'doomed', 'diplomatic', 'gambit', 'the', 'untested', 'leader', 'of', 'Israel',
'which', 'is', 'known', 'for', 'its', 'unresolved', 'conflict', 'with', 'the', 'Palestinians', 'and', 'wars', 'with', 'it
s', 'neighbors', 'tries', 'to', 'help', 'end', 'the', 'most', 'serious', 'combat', 'in', 'Europe', 'since', 'the', 'end',
'of', 'World', 'War', 'II', 'That', 's', 'what', 'happened', 'when', 'Prime', 'Minister', 'Naftali', 'Bennett', 'flew',
'to', 'Moscow', 'on', 'Feb', '26', 'a', 'Saturday', 'two', 'days', 'after', 'Russia', 'invaded', 'Ukraine', 'despite', 'b
eing', 'an', 'observant', 'Jew', 'for', 'whom', 'travel', 'on', 'the', 'Sabbath', 'is', 'forbidden', 'unless', 'it', 's',
'a', 'matter', 'of', 'life', 'and', 'death', 'JERUSALEM', 'On', 'the', 'surface', 'it', 'seems', 'like', 'a', 'doomed',
'diplomatic', 'gambit', 'the', 'untested', 'leader', 'of', 'Israel', 'which', 'is', 'known', 'for', 'its', 'unresolved',
'conflict', 'with', 'the', 'Palestinians', 'and', 'wars', 'with', 'its', 'neighbors', 'tries', 'to', 'help', 'end', 'th
e', 'most', 'serious', 'combat', 'in', 'Europe', 'since', 'the', 'end', 'of', 'World', 'War', 'II', 'That', 's', 'what',
'happened', 'when', 'Prime', 'Minister', 'Naftali', 'Bennett', 'flew', 'to', 'Moscow', 'on', 'Feb', '26', 'a', 'Saturda
y', 'two', 'days', 'after', 'Russia', 'invaded', 'Ukraine', 'despite', 'being', 'an', 'observant', 'Jew', 'for', 'whom',
'travel', 'on', 'the', 'Sabbath', 'is', 'forbidden', 'unless', 'it', 's', 'a', 'matter', 'of', 'life', 'and', 'death', 'B
ut', 'according', 'to', 'former', 'Israeli', 'national', 'security', 'adviser', 'Meir', 'Ben', 'Shabbat', 'the', 'fact',
'that', 'Israel', 'a', 'country', 'of', '9', 'million', 'people', 'is', 'able', 'to', 'maintain', 'a', 'productive', 'rel
ationship', 'with', 'Russia', 'while', 'keeping', 'close', 'ties', 'with', 'the', 'U', 'S', 'makes', 'it', 'effective',
```

Counting the number of tokens in the article using the len() function:

```
In [5]: # number of tokens

        len(token_results_1)
```

```
Out[5]: 1664
```

Calculating the frequency of each word in the article, and listing the top 10 most repeated words in the article:

```
In [6]: # calculating the frequency of words in the tokens, and displaying top 10 words

        FreqDist_before = FreqDist()

        for a in token_results_1:
            FreqDist_before[a] = FreqDist_before[a] + 1

        FreqDist_before_top10 = FreqDist_before.most_common(10)
        FreqDist_before_top10
```

```
Out[6]: [('the', 69),
         ('to', 64),
         ('a', 49),
         ('Israel', 39),
         ('and', 36),
         ('s', 33),
         ('that', 29),
         ('is', 29),
         ('with', 27),
         ('for', 26)]
```

Displaying a few sentences based on the frequently repeated words:

In [26]:
```
#displaying a few sentences based on the keywords
sentence = nltk.sent_tokenize(Article_1)

for a in sentence:
 if "Russia" in a:
  print(a)
for b in sentence:
 if "Ukraine" in b:
  print(b)
```

```
Israel leverages Russia ties to try to mediate between West and Putin.
That’s what happened when Prime Minister Naftali Bennett flew to Moscow on Feb. 26, a Saturday, two days after Russia invade
d Ukraine, despite being an observant Jew for whom travel on the Sabbath is forbidden unless it’s a matter of life and deat
h.
That’s what happened when Prime Minister Naftali Bennett flew to Moscow on Feb. 26, a Saturday, two days after Russia invade
d Ukraine, despite being an observant Jew for whom travel on the Sabbath is forbidden unless it’s a matter of life and deat
h.
But, according to former Israeli national security adviser Meir Ben-Shabbat, the fact that Israel, a country of 9 million pe
ople, is able to maintain a productive relationship with Russia while keeping close ties with the U.S. makes it effective as
a mediator.
“Israel’s assets stem from the trust it enjoys from all parties involved in the conflict: Russia, Ukraine, the United States
and NATO countries,” said Ben-Shabbat, a researcher at the Institute for National Security Studies at Tel Aviv University

He pointed in particular to a deconfliction mechanism Russia and Israel have established that allows the Israel Defense Forc
es to operate aerially in neighboring Syria against Iran and its proxies without harming Russia’s military.
Russian airstrikes hit hospitals, schools and markets, and the war killed around half a million people and sent more than 5
million fleeing to neighboring countries.
Israel has for decades had warmer relations with Moscow than many Western nations partly because of the country’s large Russ
ian-speaking community comprising some 15 percent of the population.
According to Zvi Magen, who has served as Israel’s ambassador to Ukraine and Russia and is also a researcher at the Institut
e for National Security Studies, Putin asked Israel to be an interlocutor because it is “accepted by the international commu
nity ... and is not part of an anti-Russian bloc.”
```

Cleaning the list of tokens by removing smaller words, numbers, punctuations and stop words:

In [7]:
```
# Removing smaller words, punctuations, numbers and stopwords from the tokens

nltk.download('punkt')
from nltk.corpus import stopwords
nltk.download('stopwords')
from nltk.tokenize import word_tokenize

Tokenized_words_1 = nltk.word_tokenize(Article_1)

Tokenized_words_1 = [word.lower() for word in Tokenized_words_1 if word.isalpha()]

# Removing smaller-character tokens (mostly punctuation)
cleaned_tokens_1 = [word for word in Tokenized_words_1 if len(word) > 3]

# Removing numbers
cleaned_tokens_1 = [word for word in Tokenized_words_1 if not word.isnumeric()]

cleaned_tokens_1 = [word for word in Tokenized_words_1 if not word in stopwords.words()]

print(cleaned_tokens_1)
```

```
[nltk_data] Downloading package punkt to
[nltk_data]     C:\Users\shiva\AppData\Roaming\nltk_data...
[nltk_data]   Package punkt is already up-to-date!
[nltk_data] Downloading package stopwords to
[nltk_data]     C:\Users\shiva\AppData\Roaming\nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
```

```
['israel', 'leverages', 'russia', 'ties', 'try', 'mediate', 'west', 'putin', 'work', 'israel', 'afford', 'seen', 'standing',
'democracy', 'fighting', 'freedom', 'former', 'ambassador', 'washington', 'said', 'jerusalem', 'surface', 'seems', 'like',
'doomed', 'diplomatic', 'gambit', 'untested', 'leader', 'israel', 'known', 'unresolved', 'conflict', 'palestinians', 'wars',
'neighbors', 'tries', 'help', 'serious', 'combat', 'europe', 'since', 'world', 'happened', 'prime', 'minister', 'naftali',
'bennett', 'flew', 'moscow', 'saturday', 'two', 'days', 'russia', 'invaded', 'ukraine', 'despite', 'observant', 'jew', 'trav
el', 'sabbath', 'forbidden', 'unless', 'matter', 'life', 'death', 'jerusalem', 'surface', 'seems', 'like', 'doomed', 'diplom
```

Counting the number of tokens in the cleaned list of tokens using the len() function:

```
In [8]: # length of cleaned tokens

        len(cleaned_tokens_1)
```

```
Out[8]: 847
```

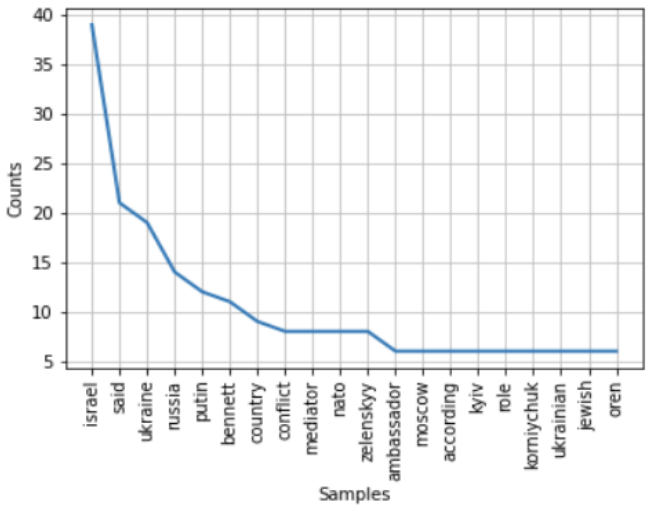
Calculating the frequency of each word in the cleaned list, and listing the top 10 most repeated words in the list:

```
In [9]: # calculating the frequency of words in the cleaned tokens, and displaying top 10 words

        FreqDist_after = FreqDist()
        for b in cleaned_tokens_1:
            FreqDist_after[b] = FreqDist_after[b] + 1

        FreqDist_after_top10 = FreqDist_after.most_common(10)
        FreqDist_after_top10
```

```
Out[9]: [('israel', 39),
         ('said', 21),
         ('ukraine', 19),
         ('russia', 14),
         ('putin', 12),
         ('bennett', 11),
         ('country', 9),
         ('conflict', 8),
         ('mediator', 8),
         ('nato', 8)]
```

Plotting the frequency of the top 20 most repeated words in the cleaned list:

```
In [10]: # plotting the frequency of cleaned tokens

         plot_words_1 = nltk.FreqDist(cleaned_tokens_1)
         plot_words_1.plot(20);
```



Article – 2: Russia Is Sending Mercenaries and Syrians to Ukraine, Western Officials Say

Loading the text file from the set directory:

```
In [123]:
# Article - 2: Russia Is Sending Mercenaries and Syrians to Ukraine, Western Officials Say
# reading the text file

textfile_2 = open('Article_2.txt', encoding='utf8')
Article_2 = textfile_2.read()
print(Article_2)
```

```
Russia Is Sending Mercenaries and Syrians to Ukraine, Western Officials Say

WASHINGTON — As Russian troops retreat from northern Ukraine and focus operations on the country's east and south, the Kr
emlin is struggling to scrape together enough combat-ready reinforcements to conduct a new phase of the war, according to
American and other Western military and intelligence officials.
Moscow initially sent 75 percent of its main ground combat forces into the war in February, Pentagon officials said. But
much of that army of more than 150,000 troops is now a spent force, after suffering logistics problems, flagging morale a
nd devastating casualties inflicted by stiffer-than-expected Ukrainian resistance, military and intelligence officials sa
y.
There are relatively few fresh Russian troops to fill the breach. Russia has withdrawn the forces — as many as 40,000 sol
diers — it had arrayed around Kyiv and Chernihiv, two cities in the north, to rearm and resupply in Russia and neighborin
g Belarus before most likely repositioning them in eastern Ukraine in the next few weeks, U.S. officials say.
The Kremlin is also rushing to the east a mix of Russian mercenaries, Syrian fighters, new conscripts and regular Russian
army troops from Georgia and easternmost Russia.
Whether this weakened but still very lethal Russian force can overcome its blunders of the first six weeks of combat and
accomplish a narrower set of war aims in a smaller swath of the country remains an open question, senior U.S. officials a
nd analysts said.
```

Separating the words in the article into tokens:

```
In [127]:
from nltk.tokenize import RegexpTokenizer
tokenizer_2 = RegexpTokenizer(r'\w+')
token_results_2 = tokenizer_2.tokenize(Article_2)
print(token_results_2)
```

```
['Russia', 'Is', 'Sending', 'Mercenaries', 'and', 'Syrians', 'to', 'Ukraine', 'Western', 'Officials', 'Say', 'WASHINGTO
N', 'As', 'Russian', 'troops', 'retreat', 'from', 'northern', 'Ukraine', 'and', 'focus', 'operations', 'on', 'the', 'coun
try', 's', 'east', 'and', 'south', 'the', 'Kremlin', 'is', 'struggling', 'to', 'scrape', 'together', 'enough', 'combat',
'ready', 'reinforcements', 'to', 'conduct', 'a', 'new', 'phase', 'of', 'the', 'war', 'according', 'to', 'American', 'an
d', 'other', 'Western', 'military', 'and', 'intelligence', 'officials', 'Moscow', 'initially', 'sent', '75', 'percent',
'of', 'its', 'main', 'ground', 'combat', 'forces', 'into', 'the', 'war', 'in', 'February', 'Pentagon', 'officials', 'sai
d', 'But', 'much', 'of', 'that', 'army', 'of', 'more', 'than', '150', '000', 'troops', 'is', 'now', 'a', 'spent', 'forc
e', 'after', 'suffering', 'logistics', 'problems', 'flagging', 'morale', 'and', 'devastating', 'casualties', 'inflicted',
'by', 'stiffer', 'than', 'expected', 'Ukrainian', 'resistance', 'military', 'and', 'intelligence', 'officials', 'say', 'T
here', 'are', 'relatively', 'few', 'fresh', 'Russian', 'troops', 'to', 'fill', 'the', 'breach', 'Russia', 'has', 'withdra
wn', 'the', 'forces', 'as', 'many', 'as', '40', '000', 'soldiers', 'it', 'had', 'arrayed', 'around', 'Kyiv', 'and', 'Cher
nihiv', 'two', 'cities', 'in', 'the', 'north', 'to', 'rearm', 'and', 'resupply', 'in', 'Russia', 'and', 'neighboring', 'B
elarus', 'before', 'most', 'likely', 'repositioning', 'them', 'in', 'eastern', 'Ukraine', 'in', 'the', 'next', 'few', 'we
eks', 'U', 'S', 'officials', 'say', 'The', 'Kremlin', 'is', 'also', 'rushing', 'to', 'the', 'east', 'a', 'mix', 'of', 'Ru
ssian', 'mercenaries', 'Syrian', 'fighters', 'new', 'conscripts', 'and', 'regular', 'Russian', 'army', 'troops', 'from',
'Georgia', 'and', 'easternmost', 'Russia', 'Whether', 'this', 'weakened', 'but', 'still', 'very', 'lethal', 'Russian', 'f
orce', 'can', 'overcome', 'its', 'blunders', 'of', 'the', 'first', 'six', 'weeks', 'of', 'combat', 'and', 'accomplish',
'a', 'narrower', 'set', 'of', 'war', 'aims', 'in', 'a', 'smaller', 'swath', 'of', 'the', 'country', 'remains', 'an', 'ope
```

Counting the number of tokens in the article using the len() function:

```
In [128]:
# number of tokens

len(token_results_2)
```

```
Out[128]: 1879
```

Calculating the frequency of each word in the article, and listing the top 10 most repeated words in the article:

In [131]:
```
# calculating the frequency of words in the tokens, and displaying top 10 words

FreqDist_before = FreqDist()

for b in token_results_2:
    FreqDist_before[b] = FreqDist_before[b] + 1

FreqDist_before_top10 = FreqDist_before.most_common(10)
FreqDist_before_top10
```

Out[131]:
```
[('the', 88),
 ('to', 69),
 ('and', 64),
 ('in', 55),
 ('of', 52),
 ('said', 30),
 ('a', 28),
 ('Russian', 25),
 ('officials', 24),
 ('is', 22)]
```

Displaying a few sentences based on the frequently repeated words:

In [27]:
```
#displaying a few sentences based on the keywords
sentence = nltk.sent_tokenize(Article_2)

for a in sentence:
 if "Russia" in a:
  print(a)
for b in sentence:
 if "Ukraine" in b:
  print(b)
```

```
Russia Is Sending Mercenaries and Syrians to Ukraine, Western Officials Say

WASHINGTON — As Russian troops retreat from northern Ukraine and focus operations on the country's east and south, the Kr
emlin is struggling to scrape together enough combat-ready reinforcements to conduct a new phase of the war, according to
American and other Western military and intelligence officials.
There are relatively few fresh Russian troops to fill the breach.
Russia has withdrawn the forces — as many as 40,000 soldiers — it had arrayed around Kyiv and Chernihiv, two cities in th
e north, to rearm and resupply in Russia and neighboring Belarus before most likely repositioning them in eastern Ukraine
in the next few weeks, U.S. officials say.
The Kremlin is also rushing to the east a mix of Russian mercenaries, Syrian fighters, new conscripts and regular Russian
army troops from Georgia and easternmost Russia.
Whether this weakened but still very lethal Russian force can overcome its blunders of the first six weeks of combat and
accomplish a narrower set of war aims in a smaller swath of the country remains an open question, senior U.S. officials a
nd analysts said.
"Russia still has forces available to outnumber Ukraine's, and Russia is now concentrating its military power on fewer li
nes of attack, but this does not mean that Russia will succeed in the east," Jake Sullivan, President Biden's national se
curity adviser, said on Monday.
He added that Russia would probably send "tens of thousands of soldiers to the front line in Ukraine's east," and continu
e to rain rockets, missiles and mortars on Kyiv, Odesa, Kharkiv, Lviv and other cities.
```

Cleaning the list of tokens by removing smaller words, numbers, punctuations and stop words:

```
In [138]:
# Removing smaller words, punctuations, numbers and stopwords from the tokens

Tokenized_words_2 = nltk.word_tokenize(Article_2)

Tokenized_words_2 = [word.lower() for word in Tokenized_words_2 if word.isalpha()]

# Removing smaller-character tokens (mostly punctuation)
cleaned_tokens_2 = [word for word in Tokenized_words_2 if len(word) > 3]

# Removing numbers
cleaned_tokens_2 = [word for word in Tokenized_words_2 if not word.isnumeric()]

cleaned_tokens_2 = [word for word in Tokenized_words_2 if not word in stopwords.words()]

print(cleaned_tokens_2)
```

```
['russia', 'sending', 'mercenaries', 'syrians', 'ukraine', 'western', 'officials', 'say', 'washington', 'russian', 'troops',
'retreat', 'northern', 'ukraine', 'focus', 'operations', 'country', 'east', 'south', 'kremlin', 'struggling', 'scrape', 'tog
ether', 'enough', 'reinforcements', 'conduct', 'new', 'phase', 'according', 'american', 'western', 'military', 'intelligenc
e', 'officials', 'moscow', 'initially', 'sent', 'percent', 'main', 'ground', 'combat', 'forces', 'february', 'pentagon', 'of
ficials', 'said', 'much', 'army', 'troops', 'spent', 'force', 'suffering', 'logistics', 'problems', 'flagging', 'devastatin
g', 'casualties', 'inflicted', 'ukrainian', 'resistance', 'military', 'intelligence', 'officials', 'say', 'relatively', 'fre
sh', 'russian', 'troops', 'fill', 'breach', 'russia', 'withdrawn', 'forces', 'many', 'soldiers', 'arrayed', 'around', 'kyi
v', 'chernihiv', 'two', 'cities', 'north', 'rearm', 'resupply', 'russia', 'neighboring', 'belarus', 'likely', 'repositionin
g', 'eastern', 'ukraine', 'next', 'weeks', 'officials', 'say', 'kremlin', 'rushing', 'east', 'mix', 'russian', 'mercenarie
s', 'syrian', 'fighters', 'new', 'conscripts', 'regular', 'russian', 'army', 'troops', 'georgia', 'easternmost', 'russia',
'whether', 'weakened', 'still', 'lethal', 'russian', 'force', 'overcome', 'blunders', 'first', 'six', 'weeks', 'combat', 'ac
complish', 'narrower', 'set', 'aims', 'smaller', 'swath', 'country', 'remains', 'open', 'question', 'senior', 'officials',
'analysts', 'said', 'russia', 'still', 'forces', 'available', 'outnumber', 'ukraine', 'russia', 'concentrating', 'military',
'power', 'fewer', 'lines', 'attack', 'mean', 'russia', 'succeed', 'east', 'jake', 'sullivan', 'president', 'biden', 'nationa
l', 'security', 'adviser', 'said', 'monday', 'next', 'stage', 'conflict', 'may', 'well', 'protracted', 'sullivan', 'said',
'added', 'russia', 'would', 'probably', 'send', 'tens', 'thousands', 'soldiers', 'front', 'line', 'ukraine', 'east', 'contin
ue', 'rain', 'rockets', 'missiles', 'mortars', 'kyiv', 'odesa', 'kharkiv', 'lviv', 'cities', 'officials', 'based', 'assessme
nts', 'satellite', 'imagery', 'electronic', 'intercepts', 'ukrainian', 'battlefield', 'reports', 'information', 'intelligenc
```

Counting the number of tokens in the cleaned list of tokens using the len() function:

```
In [139]:
# length of cleaned tokens

len(cleaned_tokens_2)
```

```
Out[139]: 1005
```

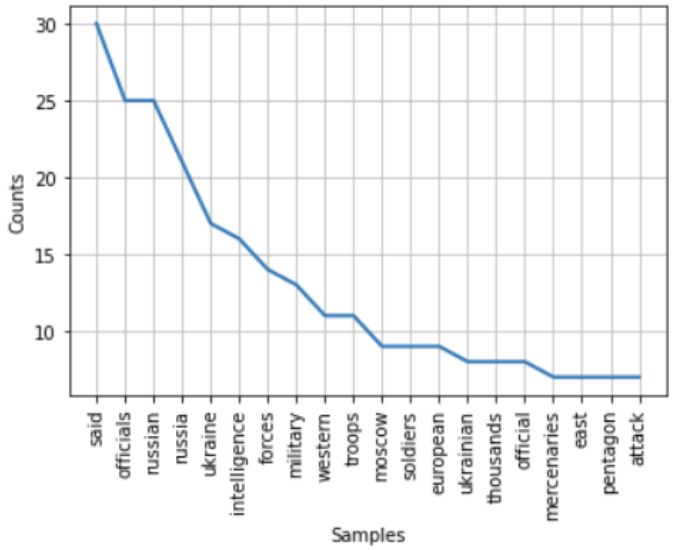
Calculating the frequency of each word in the cleaned list, and listing the top 10 most repeated words in the list:

```
In [141]:
# calculating the frequency of words in the cleaned tokens, and displaying top 10 words

FreqDist_after = FreqDist()
for b in cleaned_tokens_2:
    FreqDist_after[b] = FreqDist_after[b] + 1

FreqDist_after_top10 = FreqDist_after.most_common(10)
FreqDist_after_top10
```

```
Out[141]: [('said', 30),
 ('officials', 25),
 ('russian', 25),
 ('russia', 21),
 ('ukraine', 17),
 ('intelligence', 16),
 ('forces', 14),
 ('military', 13),
 ('western', 11),
 ('troops', 11)]
```

Plotting the frequency of the top 20 most repeated words in the cleaned list:

```
In [142]: # plotting the frequency of cleaned tokens

          plot_words_2 = nltk.FreqDist(cleaned_tokens_2)
          plot_words_2.plot(20);
```



The first Article, titled “Israel leverages Russia ties to try to mediate between West and Putin. Will it work?”, is about the stand that Israel is taking amidst the war-torn situation between Ukraine and Russia.

The second article, titled “Russia Is Sending Mercenaries and Syrians to Ukraine, Western Officials Say”, is about Russia’s intentions of deploying mercenaries into Ukraine.

Although the two news articles have been taken from two completely different news sources, there are several similarities between the articles. The top 10 frequently occurring words in both the articles (after cleaning and removing stop words) are as follows:

Article_1:

```
[('israel', 39),
 ('said', 21),
 ('ukraine', 19),
 ('russia', 14),
 ('putin', 12),
 ('bennett', 11),
 ('country', 9),
 ('conflict', 8),
 ('mediator', 8),
 ('nato', 8)]
```

Article_2:

```
[('said', 30),
 ('officials', 25),
 ('russian', 25),
 ('russia', 21),
 ('ukraine', 17),
 ('intelligence', 16),
 ('forces', 14),
 ('military', 13),
 ('western', 11),
 ('troops', 11)]
```

Comparing these two, it can be observed that the most commonly used words in both the articles are “said”, “Ukraine” and ”Russia”. The rest of the frequent words in the list, although they are not the same, they are similar and convey a similar meaning but in a different way.