

Natural Language Processing

Install spaCy first. To do so, go to <https://spacy.io/usage>. Then, complete the quickstart questionnaire with the following answers according to your system and project's objectives.

On my work laptop, I used windows and the anaconda prompt and then answered "y" after installing spaCy into my Anaconda Prompt (anaconda3) terminal.

Many tutorials/online code/online guides do not go through the process above and so I am noting it there so that you can successfully rerun this notebook.

```
!pip install -U spacy download en_core_web_sm https://anaconda.org/conda-forge/spacy-model-en\_core\_web\_sm (https://anaconda.org/conda-forge/spacy-model-en\_core\_web\_sm)
```

In [1]:

```
import spacy  
nlp = spacy.load("en_core_web_sm")
```

In [2]:

```
doc = nlp("Coffee wakes me up the most, what do you think?")  
for token in doc:  
    print(token)
```

```
Coffee  
wakes  
me  
up  
the  
most  
,  
what  
do  
you  
think  
?
```

In [3]:

```
print(f"Token \t\tLemma \t\tStopword".format('Token', 'Lemma', 'Stopword'))
print("-"*40)
for token in doc:
    print(f"{str(token)}\t{token.lemma_}\t{token.is_stop}")
```

Token	Lemma	Stopword
<hr/>		
Coffee	coffee	False
wakes	wake	False
me	-PRON-	True
up	up	True
the	the	True
most	most	True
,	,	False
what	what	True
do	do	True
you	-PRON-	True
think	think	False
?	?	False

In [4]:

```
from spacy.matcher import PhraseMatcher
matcher = PhraseMatcher(nlp.vocab, attr='LOWER')
```

In [5]:

```
terms = ['Apple', 'Facebook', 'iPhone XS', 'Google Pixel']
patterns = [nlp(text) for text in terms]
matcher.add("TerminologyList", None, *patterns)
```

In [6]:

```
# Sample review
text_doc = nlp("Glowing review overall, and some really interesting side-by-side via Apple and Facebook "
               "photography tests pitting the iPhone XS against the "
               "Galaxy Note 10 Plus and last year's iPhone XS and Google Pixel 3.")
matches = matcher(text_doc)
print(matches)
```

```
[(3766102292120407359, 14, 15), (3766102292120407359, 16, 17), (3766102292120407359, 21, 23), (3766102292120407359, 33, 35), (3766102292120407359, 36, 38)]
```

In [7]:

```
match_id, start, end = matches[0]
print(nlp.vocab.strings[match_id], text_doc[start:end])
```

TerminologyList Apple

In [31]:

```
import nltk  
nltk.download()
```

showing info https://raw.githubusercontent.com/nltk/nltk_data/gh-pages/index.xml

Out[31]:

True

In [29]:

```
from nltk.book import *
```

* Examples from NLTK Book ** Loading text1, ..., text9 and sent1, ..., sent9 Type the name of the text or sentence to view it. Type: 'texts()' or 'sents()' to list the materials. text1: Moby Dick by Herman Melville 1851
text2: Sense and Sensibility by Jane Austen 1811 text3: The Book of Genesis text4: Inaugural Address
Corpus text5: Chat Corpus text6: Monty Python and the Holy Grail text7: Wall Street Journal text8: Personals
Corpus text9: The Man Who Was Thursday by G. K. Chesterton 1908

In [30]:

```
text3.concordance("hell")
```

no matches

In [11]:

```
text1.concordance("hope")
```

Displaying 25 of 34 matches:

ire hours must elapse before I could hope for a resurrection . Sixteen hours i
ad doubts she gathers her most vital hope . It needs scarcely to be told ,
wit
to me than then . They were full of hope and fruition . Spite of this fri
gid
d Bildad , almost incoherently . " I hope ye ' ll have fine weather now ,
so t
ke a covenant with thee ? Behold the hope of him is vain ! But I have swam
thr
, does she altogether relinquish the hope of capturing one whale more . No
w ,
ye ! and I ' ll chase him round Good Hope , and round the Horn , and round
the
ivel me up , had I it . Yet is there hope . Time and tide flow wide . The
hate
l things appalled me . But how can I hope to explain myself here ; and yet
, i
y , however modified ;-- can we thus hope to light upon some chance clue t
o co
ecked , instead of rainbows speaking hope and solace to his misery , views
wha
rate feeding - grounds , could Ahab hope to encounter his prey ; but in c
ross
he standard - bearer of this forlorn hope . There , then , he sat , holdin
g up
ithout faith , hopelessly holding up hope in the midst of despair . Wet ,
dren
suffering it had bred . Cape of Good Hope , do they call ye ? Rather Cape
Torm
AT THE GOLDEN INN) The Cape of Good Hope , and all the watery region roun
d ab
other ground , the Pequod could not hope to reach her . So the signal was
set
ckers , and get something better . I hope I do no wrong , Mr . Starbuck .
It i
eanings , how may unlettered Ishmael hope to read the awful Chaldee of the
Spe
round by the way of the Cape of Good Hope . But not to speak of the passag
e th
onah ' s weathering the Cape of Good Hope at so early a day would wrest th
e ho
oing to Nineveh via the Cape of Good Hope was advanced as a signal magnifi
cati
rly entrapped in the smell , with no hope of escaping except by its breezi
ng u
eousness still shines a beacon and a hope . If we bend down our eyes , the
dar
ain changeful height he could hardly hope to attain . It has before been h
inte

In [12]:

```
text2.concordance("love")
```

Displaying 25 of 77 matches:

priety of going , and her own tender love for all her three children deter
mine
es ." " I believe you are right , my love ; it will be better that there s
houl
. It implies everything amiable . I love him already ." " I think you wil
l li
sentiment of approbation inferior to love ." " You may esteem him ." " I h
ave
n what it was to separate esteem and love ." Mrs . Dashwood now took pains
to
oner did she perceive any symptom of love in his behaviour to Elinor , tha
n sh
how shall we do without her ?" " My love , it will be scarcely a separati
on .
ise . Edward is very amiable , and I love him tenderly . But yet -- he is
not
ll never see a man whom I can really love . I require so much ! He must ha
ve a
ry possible charm ." " Remember , my love , that you are not seventeen . I
t is
f I do not now . When you tell me to love him as a brother , I shall no mo
re s
hat Colonel Brandon was very much in love with Marianne Dashwood . She rat
her
e were ever animated enough to be in love , must have long outlived every
sens
hirty - five anything near enough to love , to make him a desirable compan
ion
roach would have been spared ." " My love ," said her mother , " you must
not
pect that the misery of disappointed love had already been known to him .
This
most melancholy order of disastrous love . CHAPTER 12 As Elinor and Maria
nne
hen she considered what Marianne ' s love for him was , a quarrel seemed a
lmos
ctory way ;-- but you , Elinor , who love to doubt where you can -- it wil
l no
man whom we have all such reason to love , and no reason in the world to
thin
ded as he must be of your sister ' s love , should leave her , and leave h
er p
cannot think that . He must and does love her I am sure ." " But with a st
rang
I believe not ," cried Elinor . " I love Willoughby , sincerely love him
; an
or . " I love Willoughby , sincerely love him ; and suspicion of his integ
rity
deed a man could not very well be in love with either of her daughters , w
itho

In [13]:

```
text3.concordance("heaven")
```

Displaying 25 of 29 matches:

In the beginning God created the heaven and the earth . And the earth was
w
s so . And God called the firmament Heaven . And the evening and the morni
ng w
God said , Let the waters under the heaven be gathered together unto one p
lace
e be lights in the firmament of the heaven to divide the day from the nigh
t ;
for lights in the firmament of the heaven to give light upon the ear and
it w
od set them in the firmament of the heaven to give light upon the earth ,
And
the earth in the open firmament of heaven . And God created great whales
, an
is the breath of life , from under heaven ; and every thing that is in th
e ea
deep broken up , and the windows of heaven were opened . And the rain was
upon
h hills , that were under the whole heaven , were covered . Fifteen cubits
upw
eeping things , and the fowl of the heaven ; and they were destroyed from
the
also of the deep and the windows of heaven were stopped , and the rain fro
m he
en were stopped , and the rain from heaven was restrained ; And the waters
ret
a tower , whose top may reach unto heaven ; and let us make us a name , l
est
of the most high God , possessor of heaven and ear And blessed be the most
hig
he most high God , the possessor of heaven and earth , That I will not tak
e fr
abroad , and said , Look now toward heaven , and tell the stars , if thou
be a
stone and fire from the LORD out of heaven ; And he overthrew those cities
, a
angel of God called to Hagar out of heaven , and said unto her , What aile
th t
of the LORD called unto him out of heaven , and said , Abraham , Abrah an
d he
the LORD called unto Abraham out of heaven the second time , And said , By
mys
ltiply thy seed as the stars of the heaven , and as the sand which is upon
the
thee swear by the LORD , the God of heaven , and the God of the earth , th
at t
son thither again . The LORD God of heaven , which took me from my father
' s
hy seed to multiply as the stars of heaven , and will give unto thy seed a
ll t

In [14]:

```
text1.concordance("monstrous")
```

Displaying 11 of 11 matches:

ong the former , one was of a most monstrous size This came towards us ,
ON OF THE PSALMS . " Touching that monstrous bulk of the whale or ork we have r
ll over with a heathenish array of monstrous clubs and spears . Some were thick
d as you gazed , and wondered what monstrous cannibal and savage could eve
r hav
that has survived the flood ; most monstrous and most mountainous ! That H
immal
they might scout at Moby Dick as a monstrous fable , or still worse and mo
re de
th of Radney .'" CHAPTER 55 Of the Monstrous Pictures of Whales . I shall
ere 1
ing Scenes . In connexion with the monstrous pictures of whales , I am str
ongly
ere to enter upon those still more monstrous stories of them which are to
be fo
ght have been rummaged out of this monstrous cabinet there is no telling .
But
of Whale - Bones ; for Whales of a monstrous size are oftentimes cast up d
ead u

In [15]:

```
text7.concordance("rich")
```

Displaying 3 of 3 matches:

` I 'm very alarmed *-2 to see these rich valuations , '' says *T*-1 Smith
Bar
intage like 1984 ; the spectacularly rich 1983 runs \$ 179 *U* . In Champag
ne ,
suggests 0 stocks have gotten pretty rich in price relative to the dividen
ds 0

In [16]:

```
text7.concordance("women")
```

Displaying 16 of 16 matches:

seem benign . On Wall Street men and women walk with great purpose , *-2 n
otici
ird achievement with his `` Story of Women . '' He has made a harsh , brill
iant
gnificance , both as one of the last women 0 *T*-1 to be executed *-2 in F
rance
Mr. Wilder 's support among the very women who *T*-77 were attracted *-1 b
y the
Mr. Wilder talks about the rights of women *T*-1 , * ask him about this la
w 0 h
o n't violate the rights of pregnant women . INQUIRY CLEARS TEXAS JUDGE of
bias
ve *?* . In the tower , five men and women pull rhythmically on ropes atta
ched
ght sign is that a growing number of women have entered the once male-domi
nated
han a third of the ringers today are women . They are n't accepted *-1 eve
rywhe
t *T*-230 's particularly galling to women because the group is the sole s
ource
, '' remarked on the `` frequency of women fainting in peals , '' and sugg
ested
ably flatulent in peals . '' Another women wrote from Sheffield *-1 to say
that
meless population is made up *-21 of women and children and that only 25 %
of t
e in the increased number of men and women sleeping on our city streets du
ring
1940s until 1971 , some two million women took the synthetic hormone diet
hylst
g houses , Mercedes cars , beautiful women , expensive clothes . Among the
lot

In [17]:

```
text7.concordance('diversity')
```

no matches

In [18]:

```
text3.concordance('woman')
```

Displaying 21 of 21 matches:

D God had taken from man , made he a woman , and brought her unto the man . And flesh of my fle she shall be called Woman , because she was taken out of Man . God had made . And he said unto the woman , Yea , hath God said , Ye shall not eat o die . And the serpent said unto the woman , Ye shall not surely die : For God knowing good and evil . And when the woman saw that the tree was good for food est not eat ? And the man said , The woman whom thou gavest to be with me , she eat . And the LORD God said unto the woman , What is this that thou hast done ? s this that thou hast done ? And the woman said , The serpent beguiled me , and will put enmity between thee and the woman , and between thy seed and her seed hou shalt bruise his heel . Unto the woman he said , I will greatly multiply th ld now , I know that thou art a fair woman to look up Therefore it shall come t nto Egypt , the Egyptians beheld the woman that she was very fair . The pr inces d commended her before Phara and the woman was taken into Pharaoh ' s hous e . A , thou art but a dead man , for the woman which thou hast taken ; for she is a ant said unto him , Peradventure the woman will not be willing to follow m e unt unto my son from thence . And if the woman will not be willing to follow t hee , id unto my master , Peradventure the woman will not follow me . And he sai d unt raw for thy came let the same be the woman whom the LORD hath appointed ou t for ite , to receive his pledge from the woman ' s ha but he found her not . T hen h , and Shaul the son of a Canaanitish woman . And the sons of Levi ; Gersho n , K

In [19]:

```
text3.similar('woman')
```

lord land man earth men morning tree well people lad day place field ground city canaanites country egyptian pit darkness

In [20]:

```
text7.similar('diversity')
```

No matches

In [21]:

```
text7.similar('women')
```

the million congress stocks industrial it year men money week
dividends rose assets management sales capital executives cars trade
cents

In [22]:

```
text1.similar('monstrous')
```

true contemptible christian abundant few part mean careful puzzled
mystifying passing curious loving wise doleful gamesome singular
delightfully perilous fearless

In [23]:

```
text2.similar('monstrous')
```

very so exceedingly heartily a as good great extremely remarkably
sweet vast amazingly

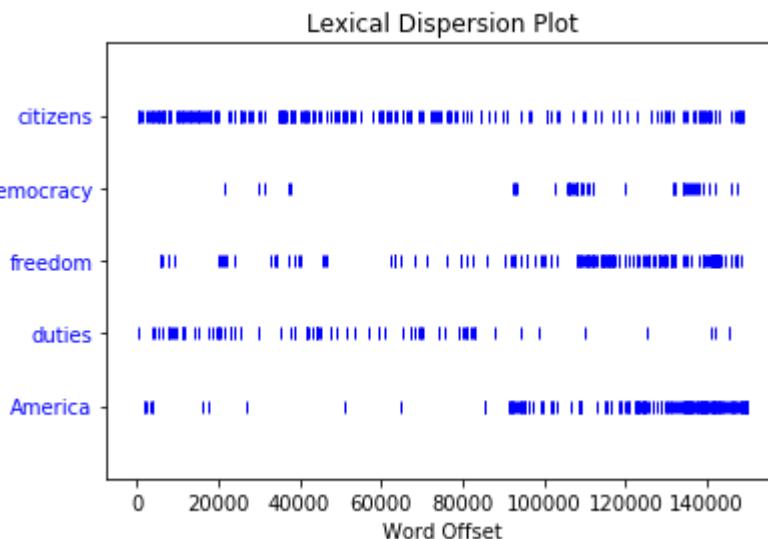
In [24]:

```
text2.common_contexts(["monstrous", "very"])
```

a.pretty am_glad a_lucky is_pretty be_glad

In [25]:

```
text4.dispersion_plot(["citizens", "democracy", "freedom", "duties", "America"])
```



In [26]:

```
text3.generate()
```

Building ngram index...

laid by her , and said unto Cain , Where art thou , and said , Go to , I will not do it for ten ' s sons ; we dreamed each man according to their generatio the firstborn said unto Laban , Because I said , Nay , but Sarah shall her name be . , duke Elah , duke Shobal , and Akan . and looked upon my affliction . Bashemath Ishmael ' s blood , but Isra for as a prince hast thou found of all the cattle in the valley , and the wo The

Out[26]:

"laid by her , and said unto Cain , Where art thou , and said , Go to ,\nI will not do it for ten ' s sons ; we dreamed each man according to\ntheir generatio the firstborn said unto Laban , Because I said , Nay ,\nbut Sara h shall her name be . , duke Elah , duke Shobal , and Akan .\nand looked u pon my affliction . Bashemath Ishmael ' s blood , but Isra\nfor as a princ e hast thou found of all the cattle in the valley , and\nthe wo The"

In [27]:

```
len(text3)
```

Out[27]:

44764

In []: