

```
In [75]: import spacy
nlp = spacy.load("en_core_web_sm")
```

```
In [76]: from spacy.lang.en.stop_words import STOP_WORDS
from string import punctuation
```

```
In [77]: # Build a List of Stopwords-->
stopwords = list(STOP_WORDS)
```

```
In [78]: doc1="""Elon Reeve Musk FRS born on June 28, 1971 is a business magnate and investor.
With an estimated net worth of around US$262 billion as of September 10, 2022, Musk is the
second-wealthiest person in the world. Musk was born in Pretoria, South Africa, where he grew up. He briefly attended the University of
Pretoria. Two years later, he matriculated at Queen's University and transferred to the University of
Toronto. The startup was acquired by Compaq for $307 million in 1999. The same year, Musk founded
X.com. In 2002, Musk founded SpaceX, an aerospace manufacturer and space transport services
company. In 2022, Musk agreed to purchase Twitter for $44 billion but later submitted a tender
offer for $54.2 billion.
```

```
In [79]: nlp = spacy.load('en_core_web_sm')
```

```
In [80]: #Building an NLP object-->
docx = nlp(doc1)
```

```
In [81]: # Tokenization of Text
mytokens = [token.text for token in docx]
```

```
In [82]: #For calculating the frequencies of each word that are not the stopwords-->
word_freq={}
for word in docx:
    if word.text not in stopwords:
        if word.text not in word_freq.keys():
            word_freq[word.text]=1;
        else:
            word_freq[word.text]+=1;
```

In [83]: *#Here are all the word frequencies-->*

```
word_freq  
'case': 1,  
'brought': 1,  
'British': 1,  
'caver': 1,  
'advised': 1,  
'Tham': 1,  
'Luang': 1,  
'cave': 1,  
'rescue': 1,  
  
'agreed': 1,  
'purchase': 1,  
'44': 1,  
'submitted': 1,  
'termination': 1,  
'letter': 1,  
'deal': 1,  
'leading': 1,  
'lawsuits': 1,  
'parties': 1}
```

In [84]: `max_freq=max(word_freq.values())`

```
for word in word_freq:  
    word_freq[word]=(word_freq[word]/max_freq)
```

In [85]: `print(word_freq)`

```
{'Elon': 0.024390243902439025, 'Reeve': 0.024390243902439025, 'Musk': 0.24390243902439024, 'FRS': 0.024390243902439025, 'born': 0.07317073170731707, 'June': 0.024390243902439025, '28': 0.024390243902439025, ',': 1.0, '1971': 0.024390243902439025, 'business': 0.04878048780487805, 'magnate': 0.024390243902439025, 'investor': 0.07317073170731707, '.': 0.5365853658536586, 'He': 0.12195121951219512, 'founder': 0.07317073170731707, 'CEO': 0.0975609756097561, 'Chief': 0.04878048780487805, 'Engineer': 0.04878048780487805, 'SpaceX': 0.04878048780487805, ';': 0.07317073170731707, 'angel': 0.024390243902439025, 'product': 0.04878048780487805, 'architect': 0.04878048780487805, 'Tesla': 0.17073170731707318, 'Inc.': 0.07317073170731707, 'The': 0.0975609756097561, 'Boring': 0.04878048780487805, 'Company': 0.04878048780487805, 'co': 0.12195121951219512, '-': 0.1951219512195122, 'Neuralink': 0.04878048780487805, 'OpenAI': 0.04878048780487805, '\\n': 0.14634146341463414, 'With': 0.024390243902439025, 'estimated': 0.024390243902439025, 'net': 0.024390243902439025, 'worth': 0.024390243902439025, 'US$': 0.024390243902439025, '262': 0.024390243902439025, 'billion': 0.07317073170731707, 'September': 0.024390243902439025, '10': 0.024390243902439025, '2022': 0.04878048780487805, 'wealthiest': 0.024390243902439025, 'person': 0.024390243902439025, 'world': 0.024390243902439025, 'according': 0.024390243902439025, 'Bloomberg': 0.024390243902439025, 'Billionaires': 0.024390243902439025, 'Index': 0.024390243902439025, 'Forbes': 0.024390243902439025, '\"': 0.024390243902439025, 'real': 0.024390243902439025, 'time': 0.024390243902439025, 'billionaires': 0.024390243902439025, 'list': 0.024390243902439025, 'Pretoria': 0.04878048780487805, 'South': 0.024390243902439025, 'Africa': 0.024390243902439025, 'grew': 0.024390243902439025, 'briefly': 0.024390243902439025, 'attended': 0.024390243902439025, 'University': 0.0975609756097561, 'moving': 0.024390243902439025, 'Canada': 0.024390243902439025, 'age': 0.024390243902439025, '17': 0.024390243902439025, 'acquiring': 0.024390243902439025, 'citizenship': 0.024390243902439025, 'Canadian': 0.024390243902439025, 'mother': 0.024390243902439025, 'Two': 0.024390243902439025, 'years': 0.024390243902439025, 'later': 0.07317073170731707, 'matriculated': 0.024390243902439025, 'Queen': 0.024390243902439025, 'transferred': 0.024390243902439025, 'Pennsylvania': 0.024390243902439025, 'received': 0.024390243902439025, 'bachelor': 0.024390243902439025, 'degrees': 0.024390243902439025, 'economics': 0.024390243902439025, 'physics': 0.024390243902439025, 'moved': 0.024390243902439025, 'California': 0.024390243902439025, '1995': 0.024390243902439025, 'attended': 0.024390243902439025, 'Stanford': 0.024390243902439025, 'decided': 0.024390243902439025, 'instead': 0.024390243902439025, 'pursue': 0.024390243902439025, 'career': 0.024390243902439025, 'founding': 0.024390243902439025, 'web': 0.024390243902439025, 'software': 0.024390243902439025, 'company': 0.14634146341463414, 'Zip2': 0.024390243902439025, 'brother': 0.024390243902439025, 'Kimbal': 0.024390243902439025, 'startup': 0.024390243902439025, 'acquired': 0.04878048780487805, 'Compaq': 0.024390243902439025, '$': 0.07317073170731707, '307': 0.024390243902439025, 'million': 0.024390243902439025, '1999': 0.024390243902439025, 'year': 0.024390243902439025, 'founded': 0.12195121951219512, 'online': 0.024390243902439025, 'bank': 0.024390243902439025, 'X.com': 0.024390243902439025, 'merged': 0.024390243902439025, 'Confinity': 0.024390243902439025, '2000': 0.024390243902439025, 'form': 0.024390243902439025, 'PayPal': 0.04878048780487805, 'eBay': 0.024390243902439025, 'bought': 0.024390243902439025, '2002': 0.04878048780487805, '1.5': 0.024390243902439025, 'In': 0.1951219512195122, 'aerospace': 0.024390243902439025, 'manufacturer': 0.04878048780487805, 'space': 0.024390243902439025, 'transport': 0.024390243902439025, 'services': 0.024390243902439025, 'serves': 0.024390243902439025, '2004': 0.024390243902439025, 'early': 0.024390243902439025, 'electric': 0.024390243902439025, 'vehicle': 0.024390243902439025, 'Motors': 0.024390243902439025, '(' : 0.0
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g': 0.024390243902439025, 'lawsuits': 0.024390243902439025, 'parties': 0.0243
90243902439025}
```

```
In [86]: # Sentence Tokens-->
sentence_list = [ sentence for sentence in docx.sents]
```

```
In [87]: #Lowering all the text-->
[w.text.lower() for t in sentence_list for w in t ]
```

```
Out[87]: ['elon',
          'reeve',
          'musk',
          'frs',
          'born',
          'on',
          'june',
          '28',
          ',',
          '1971',
          'is',
          'a',
          'business',
          'magnate',
          'and',
          'investor',
          '.',
          'he',
          'is',
          '...']
```

```
In [88]: sentence_list
```

```
Out[88]: [Elon Reeve Musk FRS born on June 28, 1971 is a business magnate and investor.,
He is the founder, CEO, and Chief Engineer at SpaceX; angel investor, CEO, and
product architect of Tesla, Inc.; founder of The Boring Company; and co-founder
of Neuralink and OpenAI.,
With an estimated net worth of around US$262 billion as of September 10, 2022,
Musk is the wealthiest person in the world according to both the Bloomberg Bill
ionaires Index and Forbes' real-time billionaires list.,
Musk was born in Pretoria, South Africa, where he grew up.,
He briefly attended the University of Pretoria before moving to Canada at age
17, acquiring citizenship through his Canadian-born mother.,
Two years later, he matriculated at Queen's University and transferred to the
University of Pennsylvania, where he received bachelor's degrees in economics a
nd physics.,
He moved to California in 1995 to attend Stanford University but decided inste
ad to pursue a business career, co-founding the web software company Zip2 with
his brother Kimbal.,
The startup was acquired by Compaq for $307 million in 1999.,
The same year, Musk co-founded online bank X.com, which merged with Confinity
in 2000 to form PayPal.,
eBay bought PayPal in 2002, for $1.5 billion.,
In 2002, Musk founded SpaceX, an aerospace manufacturer and space transport se
rvices company, of which he serves as CEO and Chief Engineer.,
In 2004, he was an early investor in electric vehicle manufacturer Tesla Motor
s, Inc.,
(now Tesla, Inc.).,
He became its chairman and product architect, eventually assuming the position
of CEO in 2008.,
In 2006, he helped create SolarCity, a solar energy company that was later acq
uired by Tesla and became Tesla Energy.,
In 2015, he co-founded OpenAI, a nonprofit research company promoting friendly
artificial intelligence (AI).,
In 2016, he co-founded Neuralink, a neurotechnology company focused on develop
ing brain-computer interfaces, and founded The Boring Company, a tunnel constru
ction company.,
Musk has proposed a hyperloop high-speed vactrain transportation system and is
the president of the Musk Foundation, which donates to scientific research and
education.,
Musk has been criticized for making unscientific and controversial statements,
such as spreading misinformation about the COVID-19 pandemic and promoting cont
entious perspectives regarding politics and various technologies, especially on
Twitter.,
In 2018, the U.S. Securities and Exchange Commission (SEC) sued Musk for tweet
ing that he had secured funding for a private takeover of Tesla, which the SEC
characterized as false and misleading.,
He settled with the SEC but did not admit guilt, and he temporarily stepped do
wn from his Tesla chairmanship.,
In 2019, he won a defamation case brought against him by a British caver who h
ad advised in the Tham Luang cave rescue.,
In 2022, Musk agreed to purchase Twitter for $44 billion but later submitted a
termination letter of the deal, leading to lawsuits between both parties.]
```

```
In [89]: #Calculating Sentence Scores-->
sentence_scores={}
for sentence in sentence_list:
    for word in sentence:
        if word.text in word_freq.keys():
            if len(sentence.text.split(' ')) < 30:
                if sentence not in sentence_scores.keys():
                    sentence_scores[sentence] = word_freq[word.text]
            else:
                sentence_scores[sentence] += word_freq[word.text]
```

```
In [90]: #Displaying All the Sentence Scores-->
sentence_scores
```

```
Out[90]: {Elon Reeve Musk FRS born on June 28, 1971 is a business magnate and investor.:
2.1463414634146343,
Musk was born in Pretoria, South Africa, where he grew up.: 2.975609756097561,
He briefly attended the University of Pretoria before moving to Canada at age
17, acquiring citizenship through his Canadian-born mother.: 2.463414634146342,
Two years later, he matriculated at Queen's University and transferred to the
University of Pennsylvania, where he received bachelor's degrees in economics a
nd physics.: 3.0731707317073176,
He moved to California in 1995 to attend Stanford University but decided inste
ad to pursue a business career, co-founding the web software company Zip2 with
his brother Kimbal.: 2.780487804878049,
The startup was acquired by Compaq for $307 million in 1999.: 0.87804878048780
5,
The same year, Musk co-founded online bank X.com, which merged with Confinity
in 2000 to form PayPal.: 3.5609756097560976,
eBay bought PayPal in 2002, for $1.5 billion.: 2.0000000000000004,
In 2002, Musk founded SpaceX, an aerospace manufacturer and space transport se
rvices company, of which he serves as CEO and Chief Engineer.: 4.70731707317073
14,
In 2004, he was an early investor in electric vehicle manufacturer Tesla Motor
s, Inc.: 2.682926829268293,
(now Tesla, Inc.): 1.926829268292683,
He became its chairman and product architect, eventually assuming the position
of CEO in 2008.: 1.9756097560975612,
In 2006, he helped create SolarCity, a solar energy company that was later acq
uired by Tesla and became Tesla Energy.: 3.5121951219512204,
In 2015, he co-founded OpenAI, a nonprofit research company promoting friendly
artificial intelligence (AI): 3.75609756097561,
In 2016, he co-founded Neuralink, a neurotechnology company focused on develop
ing brain-computer interfaces, and founded The Boring Company, a tunnel constru
ction company.: 6.073170731707318,
Musk has proposed a hyperloop high-speed vacetrain transportation system and is
the president of the Musk Foundation, which donates to scientific research and
education.: 2.5609756097560976,
He settled with the SEC but did not admit guilt, and he temporarily stepped do
wn from his Tesla chairmanship.: 2.048780487804878,
In 2019, he won a defamation case brought against him by a British caver who h
ad advised in the Tham Luang cave rescue.: 2.1707317073170733,
In 2022, Musk agreed to purchase Twitter for $44 billion but later submitted a
termination letter of the deal, leading to lawsuits between both parties.: 3.53
6585365853659}
```

```
In [91]: #Finding Top N sentences using heapq-->
from heapq import nlargest
```

```
In [92]: sum_sentences = nlargest(10, sentence_scores, key=sentence_scores.get)
```



```
In [93]: sum_sentences
```

```
Out[93]: [In 2016, he co-founded Neuralink, a neurotechnology company focused on develop  
ing brain-computer interfaces, and founded The Boring Company, a tunnel constru  
ction company.,  
In 2002, Musk founded SpaceX, an aerospace manufacturer and space transport se  
rvices company, of which he serves as CEO and Chief Engineer.,  
In 2015, he co-founded OpenAI, a nonprofit research company promoting friendly  
artificial intelligence (AI).,  
The same year, Musk co-founded online bank X.com, which merged with Confinity  
in 2000 to form PayPal.,  
In 2022, Musk agreed to purchase Twitter for $44 billion but later submitted a  
termination letter of the deal, leading to lawsuits between both parties.,  
In 2006, he helped create SolarCity, a solar energy company that was later acq  
uired by Tesla and became Tesla Energy.,  
Two years later, he matriculated at Queen's University and transferred to the  
University of Pennsylvania, where he received bachelor's degrees in economics a  
nd physics.,  
Musk was born in Pretoria, South Africa, where he grew up.,  
He moved to California in 1995 to attend Stanford University but decided inste  
ad to pursue a business career, co-founding the web software company Zip2 with  
his brother Kimbal.,  
In 2004, he was an early investor in electric vehicle manufacturer Tesla Motor  
s, Inc.]
```

```
In [94]: for w in sum_sentences:
          print(w.text)

# List Comprehension of Sentences Converted From Spacy.span to strings
final_sentences = [ w.text for w in sum_sentences]
final_sentences
```

In 2016, he co-founded Neuralink, a neurotechnology company focused on developing brain-computer interfaces, and founded The Boring Company, a tunnel construction company.

In 2002, Musk founded SpaceX, an aerospace manufacturer and space transport services company, of which he serves as CEO and Chief Engineer.

In 2015, he co-founded OpenAI, a nonprofit research company promoting friendly artificial intelligence (AI).

The same year, Musk co-founded online bank X.com, which merged with Confinity in 2000 to form PayPal.

In 2022, Musk agreed to purchase Twitter for \$44 billion but later submitted a termination letter of the deal, leading to lawsuits between both parties.

In 2006, he helped create SolarCity, a solar energy company that was later acquired by Tesla and became Tesla Energy.

Two years later, he matriculated at Queen's University and transferred to the University of Pennsylvania, where he received bachelor's degrees in economics and physics.

Musk was born in Pretoria, South Africa, where he grew up.

He moved to California in 1995 to attend Stanford University but decided instead to pursue a business career, co-founding the web software company Zip2 with his brother Kimbal.

In 2004, he was an early investor in electric vehicle manufacturer Tesla Motors, Inc.

```
Out[94]: ['In 2016, he co-founded Neuralink, a neurotechnology company focused on developing brain-computer interfaces, and founded The Boring Company, a tunnel construction company.',
          'In 2002, Musk founded SpaceX, an aerospace manufacturer and space transport services company, of which he serves as CEO and Chief Engineer.',
          'In 2015, he co-founded OpenAI, a nonprofit research company promoting friendly artificial intelligence (AI).',
          'The same year, Musk co-founded online bank X.com, which merged with Confinity in 2000 to form PayPal.',
          'In 2022, Musk agreed to purchase Twitter for $44 billion but later submitted a termination letter of the deal, leading to lawsuits between both parties.',
          'In 2006, he helped create SolarCity, a solar energy company that was later acquired by Tesla and became Tesla Energy.',
          "Two years later, he matriculated at Queen's University and transferred to the University of Pennsylvania, where he received bachelor's degrees in economics and physics.",
          'Musk was born in Pretoria, South Africa, where he grew up.',
          'He moved to California in 1995 to attend Stanford University but decided instead to pursue a business career, co-founding the web software company Zip2 with his brother Kimbal.\n',
          'In 2004, he was an early investor in electric vehicle manufacturer Tesla Motors, Inc.']
```

```
In [95]: summary = ' '.join(final_sentences)
summary
```

```
Out[95]: "In 2016, he co-founded Neuralink, a neurotechnology company focused on develop
ing brain-computer interfaces, and founded The Boring Company, a tunnel constru
ction company. In 2002, Musk founded SpaceX, an aerospace manufacturer and spac
e transport services company, of which he serves as CEO and Chief Engineer. In
2015, he co-founded OpenAI, a nonprofit research company promoting friendly art
ificial intelligence (AI). The same year, Musk co-founded online bank X.com, wh
ich merged with Confinity in 2000 to form PayPal. In 2022, Musk agreed to purch
ase Twitter for $44 billion but later submitted a termination letter of the dea
l, leading to lawsuits between both parties. In 2006, he helped create SolarCit
y, a solar energy company that was later acquired by Tesla and became Tesla Ene
rgy. Two years later, he matriculated at Queen's University and transferred to
the University of Pennsylvania, where he received bachelor's degrees in economi
cs and physics. Musk was born in Pretoria, South Africa, where he grew up. He m
oved to California in 1995 to attend Stanford University but decided instead to
pursue a business career, co-founding the web software company Zip2 with his br
other Kimbal.\n In 2004, he was an early investor in electric vehicle manufactu
rer Tesla Motors, Inc."
```

```
In [96]: len(summary)
```

```
Out[96]: 1285
```

```
In [97]: len(doc1)
```

```
Out[97]: 2961
```

```
In [97]:
```