WWDC_Raw_Code

January 11, 2025

[ ]:
```
pip install newspaper3k
```

```
Requirement already satisfied: newspaper3k in ./anaconda3/lib/python3.11/site-
packages (0.2.8)
Requirement already satisfied: beautifulsoup4>=4.4.1 in
./anaconda3/lib/python3.11/site-packages (from newspaper3k) (4.12.2)
Requirement already satisfied: Pillow>=3.3.0 in ./anaconda3/lib/python3.11/site-
packages (from newspaper3k) (9.4.0)
Requirement already satisfied: PyYAML>=3.11 in ./anaconda3/lib/python3.11/site-
packages (from newspaper3k) (6.0)
Requirement already satisfied: cssselect>=0.9.2 in
./anaconda3/lib/python3.11/site-packages (from newspaper3k) (1.1.0)
Requirement already satisfied: lxml>=3.6.0 in ./anaconda3/lib/python3.11/site-
packages (from newspaper3k) (4.9.3)
Requirement already satisfied: nltk>=3.2.1 in ./anaconda3/lib/python3.11/site-
packages (from newspaper3k) (3.8.1)
Requirement already satisfied: requests>=2.10.0 in
./anaconda3/lib/python3.11/site-packages (from newspaper3k) (2.31.0)
Requirement already satisfied: feedparser>=5.2.1 in
./anaconda3/lib/python3.11/site-packages (from newspaper3k) (6.0.11)
Requirement already satisfied: tldextract>=2.0.1 in
./anaconda3/lib/python3.11/site-packages (from newspaper3k) (3.2.0)
Requirement already satisfied: feedfinder2>=0.0.4 in
./anaconda3/lib/python3.11/site-packages (from newspaper3k) (0.0.4)
Requirement already satisfied: jieba3k>=0.35.1 in
./anaconda3/lib/python3.11/site-packages (from newspaper3k) (0.35.1)
Requirement already satisfied: python-dateutil>=2.5.3 in
./anaconda3/lib/python3.11/site-packages (from newspaper3k) (2.8.2)
Requirement already satisfied: tinysegmenter==0.3 in
./anaconda3/lib/python3.11/site-packages (from newspaper3k) (0.3)
Requirement already satisfied: soupsieve>1.2 in ./anaconda3/lib/python3.11/site-
packages (from beautifulsoup4>=4.4.1->newspaper3k) (2.4)
Requirement already satisfied: six in ./anaconda3/lib/python3.11/site-packages
(from feedfinder2>=0.0.4->newspaper3k) (1.16.0)
Requirement already satisfied: sgmllib3k in ./anaconda3/lib/python3.11/site-
packages (from feedparser>=5.2.1->newspaper3k) (1.0.0)
Requirement already satisfied: click in ./anaconda3/lib/python3.11/site-packages
(from nltk>=3.2.1->newspaper3k) (8.0.4)
```

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Requirement already satisfied: joblib in ./anaconda3/lib/python3.11/site-
packages (from nltk>=3.2.1->newspaper3k) (1.2.0)
Requirement already satisfied: regex>=2021.8.3 in
./anaconda3/lib/python3.11/site-packages (from nltk>=3.2.1->newspaper3k)
(2022.7.9)
Requirement already satisfied: tqdm in ./anaconda3/lib/python3.11/site-packages
(from nltk>=3.2.1->newspaper3k) (4.65.0)
Requirement already satisfied: charset-normalizer<4,>=2 in
./anaconda3/lib/python3.11/site-packages (from requests>=2.10.0->newspaper3k)
(2.0.4)
Requirement already satisfied: idna<4,>=2.5 in ./anaconda3/lib/python3.11/site-
packages (from requests>=2.10.0->newspaper3k) (3.4)
Requirement already satisfied: urllib3<3,>=1.21.1 in
./anaconda3/lib/python3.11/site-packages (from requests>=2.10.0->newspaper3k)
(1.26.16)
Requirement already satisfied: certifi>=2017.4.17 in
./anaconda3/lib/python3.11/site-packages (from requests>=2.10.0->newspaper3k)
(2023.7.22)
Requirement already satisfied: requests-file>=1.4 in
./anaconda3/lib/python3.11/site-packages (from tldextract>=2.0.1->newspaper3k)
(1.5.1)
Requirement already satisfied: filelock>=3.0.8 in
./anaconda3/lib/python3.11/site-packages (from tldextract>=2.0.1->newspaper3k)
(3.9.0)
Note: you may need to restart the kernel to use updated packages.
```

[ ]:

```python
from newspaper import Article
from nltk import pos_tag, word_tokenize
from urllib.request import urlopen
from urllib.parse import urlsplit
from pathlib import Path
from bs4 import BeautifulSoup
import nltk
import re

all_tokens = []

def get_transcript(url):
    article = Article(url)
    article.download()
    article.parse()
    text = article.text

    data = urlopen(url).read()
    soup = BeautifulSoup(data, 'html.parser')
    content = soup.find('section', class_='body-content')
    tokens = [word_tokenize(sent) for sent in nltk.sent_tokenize(text)]
    tagged = [pos_tag(sent) for sent in tokens]

    # Extract the year from the URL using regular expression
    year_match = re.search(r'/(\d{4})-', url)

    if year_match:
        year = year_match.group(1)

        folder = Path('singjupost')
        filename = folder / (f'{year}_{urlsplit(url).path.replace("/", "_")}.
 ↪txt')
        folder.mkdir(exist_ok=True)

        with open(filename, 'w') as f:
            for sent in tagged:
                for w, t in sent:
                    print(w, t, sep='_', end=' ', file=f)
                print(file=f)

        all_tokens.extend(tokens)

links = [
    'https://singjupost.com/full-transcript-tim-cook-at-apple-wwdc-2020-keynote/
 ↪?singlepage=1',
    'https://singjupost.com/full-transcript-tim-cook-at-apple-wwdc-2019-keynote/
 ↪?singlepage=1',
    'https://singjupost.com/tim-cook-at-apple-wwdc-2018-keynote-full-transcript/
 ↪?singlepage=1',
    'https://singjupost.com/
 ↪apple-ceo-tim-cook-keynote-at-wwdc-2017-full-transcript/?singlepage=1',
    'https://singjupost.com/
 ↪apple-ceo-tim-cook-keynote-at-wwdc-2016-full-transcript/?singlepage=1',
    'https://singjupost.com/
 ↪apple-wwdc-2015-keynote-special-event-june-2015-full-transcript/?
 ↪singlepage=1',
    'https://singjupost.com/
 ↪apple-ceo-tim-cook-keynote-wwdc-june-2014-transcript/?singlepage=1',
    'https://singjupost.com/
 ↪apple-ceo-tim-cook-keynote-wwdc-june-2013-conference-transcript/?
 ↪singlepage=1',
    'https://singjupost.com/
 ↪steve-jobs-introduces-iphone-4-facetime-at-wwdc-2010-full-transcript/?
 ↪singlepage=1',
    'https://singjupost.com/steve-jobs-iphone-2007-presentation-full-transcript/
 ↪?singlepage=1',
]
```

[ ]:
```
corpus_folder = Path('singjupost')

corpus = TaggedCorpusReader(str(corpus_folder), r'[\.].*\.txt', sep='_')

words = corpus.words()
sample_text = ' '.join(words[:100])
```

[ ]:
```
len(corpus.words())
```

[ ]:
```
195338
```

[ ]:
```
import nltk
from nltk.collocations import *
```

[ ]:
```
tokens = list(corpus.words())
bigram_measures = nltk.collocations.BigramAssocMeasures()
finder = BigramCollocationFinder.from_words(tokens)
```

[ ]:
```
def notalpha(s):
    return not s.isalpha()

finder.apply_word_filter(notalpha)
```

[ ]:
```
finder.nbest(bigram_measures.likelihood_ratio, 10)
```

[ ]:
```
[('going', 'to'),
 ('you', 'can'),
 ('I', 'can'),
 ('want', 'to'),
 ('of', 'course'),
 ('look', 'at'),
 ('as', 'well'),
 ('App', 'Store'),
 ('d', 'like'),
 ('on', 'the')]
```

[ ]:
```
finder.apply_freq_filter(10)
```

[ ]:
```
finder.nbest(bigram_measures.pmi, 10)
```

[ ]:
```
[('Final', 'Cut'),
 ('Stacey', 'Lysik'),
 ('Big', 'Sur'),
 ('Industrial', 'Light'),
 ('Lydia', 'Winters'),
 ('Saxs', 'Persson'),
 ('sneak', 'peek'),
 ('Lauren', 'Ridge'),
 ('El', 'Capitan'),
 ('Imran', 'Chaudhri')]
```

```
[ ]: finder.nbest(bigram_measures.likelihood_ratio, 10)
```

```
[ ]: [('going', 'to'),
      ('you', 'can'),
      ('I', 'can'),
      ('want', 'to'),
      ('of', 'course'),
      ('look', 'at'),
      ('as', 'well'),
      ('App', 'Store'),
      ('d', 'like'),
      ('on', 'the')]
```

```
[ ]: trigram_measures = nltk.collocations.TrigramAssocMeasures()
     finder3 = TrigramCollocationFinder.from_words(tokens)
     finder3.apply_word_filter(notalpha)
     finder3.apply_freq_filter(10)
     finder3.nbest(trigram_measures.likelihood_ratio, 10)
```

```
[ ]: [('m', 'going', 'to'),
      ('re', 'going', 'to'),
      ('going', 'to', 'be'),
      ('going', 'to', 'make'),
      ('going', 'to', 'show'),
      ('going', 'to', 'do'),
      ('am', 'going', 'to'),
      ('going', 'to', 'get'),
      ('going', 'to', 'go'),
      ('going', 'to', 'bring')]
```

```
[ ]: finder3.nbest(trigram_measures.pmi, 10)
```

```
[ ]: [('Tweet', 'Pinterest', 'Email'),
      ('shares', 'Share', 'Tweet'),
      ('Do', 'Not', 'Disturb'),
      ('Share', 'Tweet', 'Pinterest'),
      ('New', 'York', 'Times'),
      ('Chief', 'Creative', 'Officer'),
      ('third', 'party', 'apps'),
      ('iOS', 'software', 'program'),
      ('Industrial', 'Light', 'and'),
      ('Light', 'and', 'Magic')]
```

```
[ ]: finder3.nbest(trigram_measures.raw_freq, 10)
```

```
[ ]: [('I', 'want', 'to'),
      ('re', 'going', 'to'),
      ('m', 'going', 'to'),
      ('d', 'like', 'to'),
      ('I', 'can', 'just'),
      ('going', 'to', 'be'),
      ('you', 'can', 'see'),
      ('take', 'a', 'look'),
      ('s', 'take', 'a'),
      ('a', 'look', 'at')]
```

```
[ ]: finder3.nbest(trigram_measures.raw_freq, 10)
```

```
[ ]: [('I', 'want', 'to'),
      ('re', 'going', 'to'),
      ('m', 'going', 'to'),
      ('d', 'like', 'to'),
      ('I', 'can', 'just'),
      ('going', 'to', 'be'),
      ('you', 'can', 'see'),
      ('take', 'a', 'look'),
      ('s', 'take', 'a'),
      ('a', 'look', 'at')]
```

```
[ ]: import re

     def caps(s):
         return re.search(r'^([A-Z][A-Z]+|Q)$', s)

     finder.apply_word_filter(caps)
     finder.nbest(bigram_measures.pmi, 10)
```

```
[ ]: [('Final', 'Cut'),
      ('Stacey', 'Lysik'),
      ('Big', 'Sur'),
      ('Industrial', 'Light'),
      ('Lydia', 'Winters'),
      ('Saxs', 'Persson'),
      ('sneak', 'peek'),
      ('Lauren', 'Ridge'),
      ('El', 'Capitan'),
      ('Imran', 'Chaudhri')]
```

```
[ ]: import nltk
     from nltk.tokenize import WhitespaceTokenizer, RegexpTokenizer
     import re
```

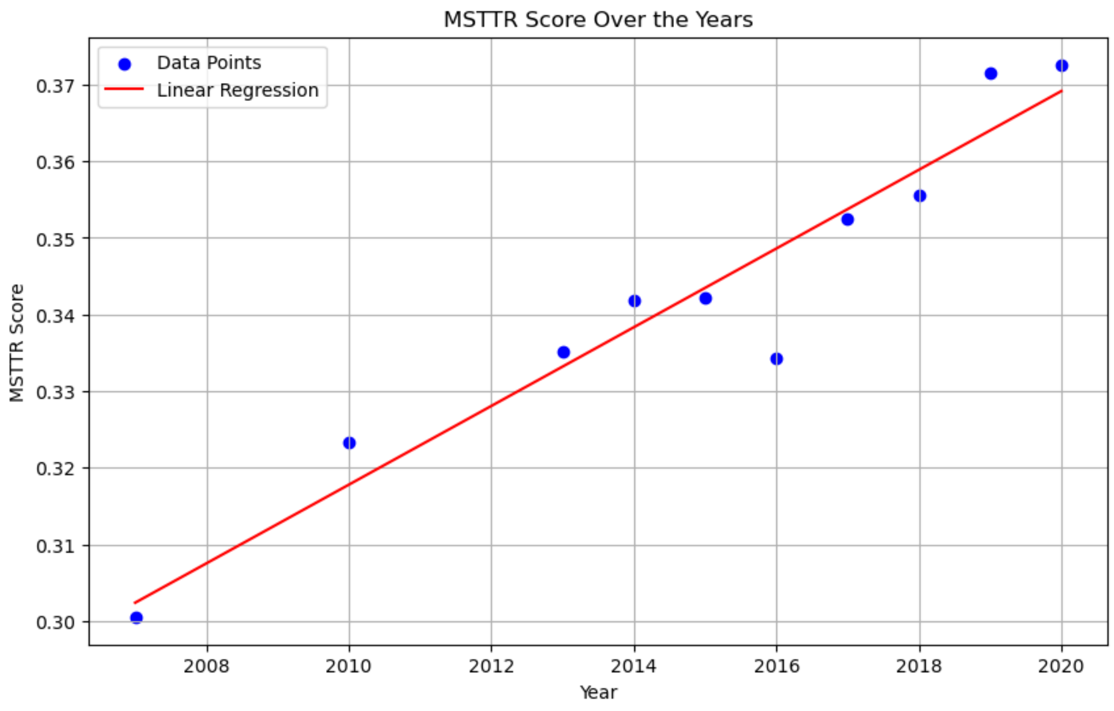
```
from toolz import partition

%precision 3
def normalize(text):
    return [tok.lower() for tok in text if tok.isalpha()]

def ttr(text):
    text = normalize(text)
    return len(set(text)) / len(text)

def msttr(text, k=2000):
    text = normalize(text)
    ttrs = [ttr(chunk) for chunk in partition(k, text)]
    return sum(ttrs) / len(ttrs)
msttr(corpus.words(), k=1000)
```

[ ]: 0.347

[ ]:
```
for file_id in corpus.fileids():
    # Extract the year from the file_id using a different regular expression
    year_match = re.search(r'(\d{4})[^0-9]', file_id)

    if year_match:
        year = year_match.group(1)
        words_in_category = corpus.words(file_id)
        score = msttr(words_in_category, k=1000)
        print(f'Year {year} WWDC MSTR: {score:.3f}')
```

```
Year 2016 WWDC MSTR: 0.334
Year 2017 WWDC MSTR: 0.353
Year 2013 WWDC MSTR: 0.335
Year 2014 WWDC MSTR: 0.342
Year 2015 WWDC MSTR: 0.342
Year 2019 WWDC MSTR: 0.372
Year 2020 WWDC MSTR: 0.373
Year 2010 WWDC MSTR: 0.323
Year 2007 WWDC MSTR: 0.301
Year 2018 WWDC MSTR: 0.356
```

[ ]:
```
import matplotlib.pyplot as plt
import numpy as np

years, scores = zip(*(sorted((int(re.search(r'(\d{4})[^0-9]', file_id).
↪group(1)), msttr(corpus.words(file_id), k=1000)) for file_id in corpus.
↪fileids())))

plt.figure(figsize=(10, 6))
plt.scatter(years, scores, color='blue', marker='o', label='Data Points')
plt.xlabel('Year')
plt.ylabel('MSTTR Score')
plt.title('MSTTR Score Over the Years')
plt.grid(axis='both')

# Linear regression
coefficients = np.polyfit(years, scores, 1)
polynomial = np.poly1d(coefficients)
line_x = np.linspace(min(years), max(years), 100)
line_y = polynomial(line_x)
plt.plot(line_x, line_y, color='red', label='Linear Regression')

plt.legend()
plt.show()
```

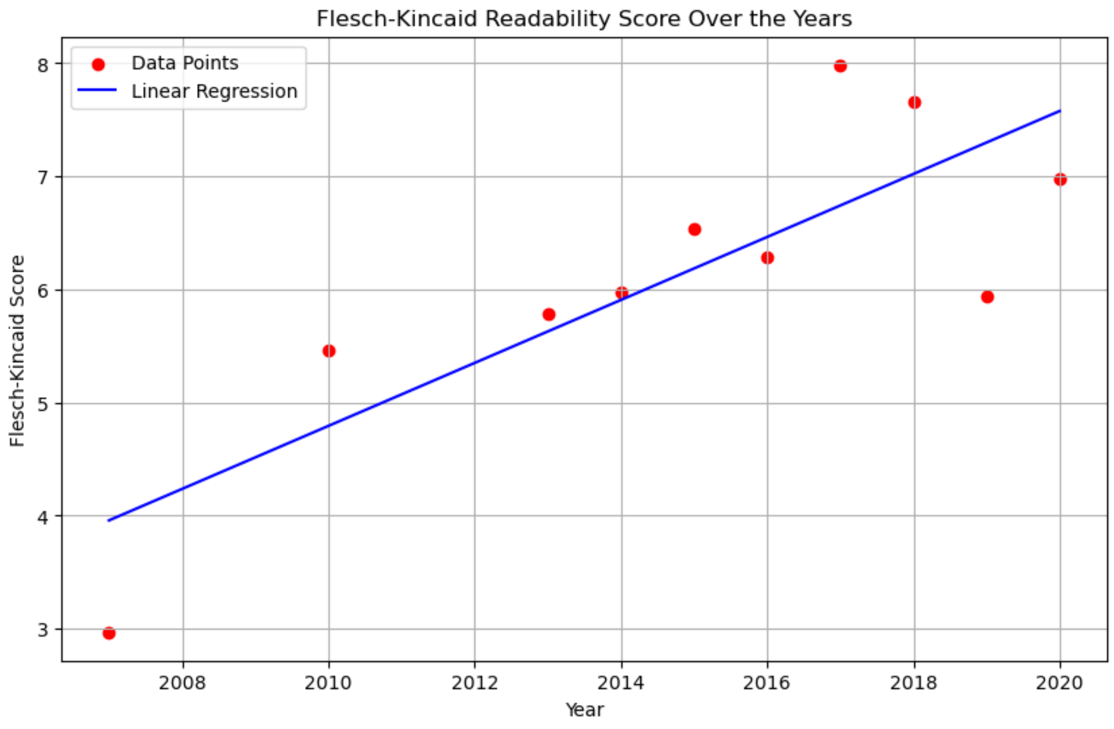


[20]:
```
import nltk
import re
from nltk.tokenize import word_tokenize, sent_tokenize

# Custom function to count syllables in a word
cmudict = nltk.corpus.cmudict.dict()

def syllables(word):
    if word.lower() in cmudict:
        return len([p for p in cmudict[word.lower()][0] if p[-1].isdigit()])
    else:
        return len(re.findall(r'[aeiou]+', word.lower()))

# Custom function to calculate Flesch-Kincaid readability score
def fk(text):
    words = len(word_tokenize(text))
    sylls = sum([syllables(w) for w in word_tokenize(text)])
    sents = len(sent_tokenize(text))
    return 0.39 * (words/sents) + 11.8 * (sylls/words) - 15.59

# Calculate and print Flesch-Kincaid scores for each file in the corpus
for file_id in corpus.fileids():
    # Extract the year from the file_id using a different regular expression
    year_match = re.search(r'(\d{4})[^0-9]', file_id)

    if year_match:
        year = year_match.group(1)
        full_text = corpus.raw(file_id)
        score = fk(full_text)
        print(f'Year {year} WWDC FK: {score:.3f}')
```

```
Year 2016 WWDC FK: 6.285
Year 2017 WWDC FK: 7.985
Year 2013 WWDC FK: 5.787
Year 2014 WWDC FK: 5.971
Year 2015 WWDC FK: 6.533
Year 2019 WWDC FK: 5.940
Year 2020 WWDC FK: 6.981
Year 2010 WWDC FK: 5.462
Year 2007 WWDC FK: 2.970
Year 2018 WWDC FK: 7.665
```

[21]:
```
import matplotlib.pyplot as plt
import numpy as np

years, scores = zip(*(sorted((int(re.search(r'(\d{4})[^0-9]', file_id).
 ↪group(1)), fk(corpus.raw(file_id))) for file_id in corpus.fileids())))

plt.figure(figsize=(10, 6))
plt.scatter(years, scores, color='red', marker='o', label='Data Points')
plt.xlabel('Year')
plt.ylabel('Flesch-Kincaid Score')
plt.title('Flesch-Kincaid Readability Score Over the Years')
plt.grid(axis='both')

# Linear regression
```

```
coefficients = np.polyfit(years, scores, 1)
polynomial = np.poly1d(coefficients)
line_x = np.linspace(min(years), max(years), 100)
line_y = polynomial(line_x)
plt.plot(line_x, line_y, color='blue', label='Linear Regression')

plt.legend()
plt.show()
```



```
[ ]:
```