```
In [1]:  import random
         import nltk
         from collections import Counter
         from collections import defaultdict
         from random import sample
         from datasets import load_dataset
         # load in the training and testing datasets
         dataset = load_dataset('google_wellformed_query')
         testset = load_dataset('jordane95/trec-dl-2019-query')
```

Found cached dataset google_wellformed_query (/Users/laurynfluellen/.cache/huggingface/datasets/google_wellformed_quer
y/default/0.0.0/9430d51f37bef61e99ec438f538b079d42bfc8da5e45b1e26bd85e35ba8a8a89)
  0%| | 0/3 [00:00<?, ?it/s]

Using custom data configuration jordane95--trec-dl-2019-query-07c31337644c79b5
Found cached dataset json (/Users/laurynfluellen/.cache/huggingface/datasets/jordane95___json/jordane95--trec-dl-2019-
query-07c31337644c79b5/0.0.0/e6070c77f18f01a5ad4551a8b7edfba20b8438b7cad4d94e6ad9378022ce4aab)
  0%| | 0/1 [00:00<?, ?it/s]

```
In [2]:  class Dataset(object):
             def __init__(self, sample_ratio=1.0):
                 # combine all of the lines to take in for training
                 self.data_lines = []
                 dataset = load_dataset('google_wellformed_query')
                 self.data_lines = self.data_lines + dataset['train']['content']
                 self.data_lines = self.data_lines + dataset['test']['content']
                 self.data_lines = self.data_lines + dataset['validation']['content']
                 # filter out lines that are not greater than 0
                 self.data_lines = list(filter(lambda data_lines: len(data_lines) > 0, self.data_lines))
         data_set = Dataset()
```

Found cached dataset google_wellformed_query (/Users/laurynfluellen/.cache/huggingface/datasets/google_wellformed_quer
y/default/0.0.0/9430d51f37bef61e99ec438f538b079d42bfc8da5e45b1e26bd85e35ba8a8a89)
  0%| | 0/3 [00:00<?, ?it/s]

```
In [3]:  # print out a sample of 5 lines of training set to get an idea of what it looks like
         sample(data_set.data_lines, 5)
```

```
Out[3]:  ['What is cubic meter in chemistry ?',
          'Nature in becoming a detective ?',
          'Professor layton camera puzzle ?',
          'What will prevent iron rusting ?',
          'What are carry-on restrictions to board an airplane ?']
```

```
In [4]:  class AutoSuggestModel(object):
             def __init__(self,
                          unknown_token='',
```

```python
                start_token="<s>",
                end_token="</s>",
                k=1):
        self.start_token = start_token
        self.end_token = end_token
        self.no_match_threshold = 5
        self.unknown_word = "UNK"
        self.k = k
        self.word_frequency = Counter()
        self.dict_ngram_word_frequency = {}
        self.tokenized_sentences = None
        self.dict_ngram_plus1_word_frequency = {}

    def tokenize(self, sentences):
        # Set words to lower case and tokenize with nltk package
        self.tokenized_sentences = [nltk.word_tokenize(words.lower()) for words in sentences]

    def train(self, minimum_freq=5, ngram=3):
        self.minimum_freq = minimum_freq
        #Allows for ngrams of differing sizes
        self.ngram = ngram
        # Counts word counts
        for tokenized_sentence in self.tokenized_sentences:
            self.word_frequency.update(tokenized_sentence)
        self.vocab = list(self.word_frequency.keys()) + [self.unknown_word, ""]

        # add UNK token to unknown words -> words with low frequency
        new = []
        for sentence in self.tokenized_sentences:
            new_sentence = []
            for each in sentence:
                if self.word_frequency[each] != 0:
                    new_sentence.append(each)
                #if the frequency is not at least 1 add UNK to list instead of the word
                else:
                    new_sentence.append(self.unknown_word)
            new.append(new_sentence)
        self.tokenized_sentences = new

        # add to dictionary
        self.dict_ngram_word_frequency = self.count_ngrams(self.tokenized_sentences, self.ngram)
        self.dict_ngram_plus1_word_frequency = self.count_ngrams(self.tokenized_sentences, self.ngram + 1)

    def count_ngrams(self, tokenized_sentences, ngram):
        frequency = defaultdict(lambda: 0)
        for sentence in tokenized_sentences:
            #add the start and end tokens
            sentence = [self.start_token] * ngram + sentence + [self.end_token]
```

```python
            #account for sentence length for different ngram sizes
            m = len(sentence) if ngram == 1 else len(sentence) - 1
            for i in range(m):
                ngram_token = sentence[i:i + ngram]
                frequency[" ".join(ngram_token)] += 1
        return frequency

    def estimate_probability(self, word, previous_ngram):
        # turn previous_ngram into a list was returning a tuple
        if type(previous_ngram) != list:
            previous_ngram = [previous_ngram]
            #join to take in as a string
        previous_ngram = " ".join(previous_ngram)
        previous_ngram_count = self.dict_ngram_word_frequency.get(previous_ngram, 0)
        if previous_ngram_count == 0:
            return 0
        denominator = previous_ngram_count + self.k * len(self.vocab)
        n_plus1_gram = previous_ngram + " " + word
        n_plus1_gram_count = self.dict_ngram_plus1_word_frequency.get(n_plus1_gram, 0)
        numerator = n_plus1_gram_count + self.k
        probability = numerator / denominator
        return probability

    def estimate_probabilities(self, previous_ngram):
        probabilities = {}
        # turn previous_ngram into a list was returning a tuple
        if type(previous_ngram) != list:
            previous_ngram = [previous_ngram]
        previous_ngram = " ".join(previous_ngram).lower()
        for each in self.vocab:
            probabilities[each] = self.estimate_probability(each, previous_ngram)
        return probabilities

    def suggestions(self, previous_tokens, num_suggestions=5, start_with=None):
        #Prevuous token is the last ngram from the previous context sentence
        previous_ngram = previous_tokens[-self.ngram:]
        probabilities = self.estimate_probabilities(previous_ngram)
        probs = probabilities.items()
        probs = filter(lambda t: t[1] > 0, probs)
        if start_with:
            probs = filter(lambda t: t[0].startswith(start_with), probs)
        # to sort by probability (highest at the front)
        probs = sorted(probs, key=lambda t: t[1], reverse=True)
        # Map the word and probability to each other so we have a list of words instead of a list of integers
        words = map(lambda t: t[0], probs)
        words_list = list(words)
        return words_list[:num_suggestions],
```

```
In [5]: class Testset(object):
            def __init__(self, sample_ratio=1.0):
                # combine all of the lines to take in for training
                self.test_lines = []
                testset = load_dataset('jordane95/trec-dl-2019-query')
                self.test_lines = self.test_lines + testset['train']['query']
                # filter out lines that are not greater than 0
                self.test_lines = list(filter(lambda test_lines: len(test_lines) > 0, self.test_lines))


        test_set = Testset()
```

```
In [6]: sample(test_set.test_lines, 5)
```

```
Out[6]: ['what county is pontiac, illinois in?',
         'what does chs stand for?',
         'define apprehension.',
         'is the titanic the biggest ship ever',
         'sensibilities, definition']
```

```
In [7]: test_lines = testset['train']['query']
        sentence1 = ["what", "is", "a", "period"]
        sentence2 = ["wat", "is"]
        sentence3 = ["stamford", "federal", "credit", "union", "routing"]
        sentence4 = ["what", "format", "does", "a", "thumb", "drive", "need", "to", "be", "for", "a"]
```

```
In [8]: # All models
        model = AutoSuggestModel()
        model.tokenize(test_lines)
        model.train(minimum_freq=5, ngram=1)

        model2 = AutoSuggestModel()
        model2.tokenize(test_lines)
        model2.train(minimum_freq=5, ngram=2)

        model3 = AutoSuggestModel()
        model3.tokenize(test_lines)
        model3.train(minimum_freq=5, ngram=3)


        model4 = AutoSuggestModel()
```

```python
model4.tokenize(test_lines)
model4.train(minimum_freq=5, ngram=4)
```

In [9]:
```python
import string
list_sentences = test_set.test_lines
#print(len(list_sentences))
#print(list_sentences)
sentnece_minus_1_for_suggestion = []
sentence = []
popped = []
length_list = []
for each in list_sentences:
    no_punct = each.translate(str.maketrans('', '', string.punctuation))
    split = list(no_punct.split(" "))
    #print(split)
    sentence.append(split)
    #print(len(split))
    length_list.append(len(split))
average = sum(length_list)/len(length_list)
print(average)
#print("\nFull sentence:", sentence, "\n")
for items in sentence:
    #print(items[:-1])
    sentnece_minus_1_for_suggestion.append(items[:-1])
    popped.append(items.pop())
#print("Sentence minus 1:", sentnece_minus_1_for_suggestion, "\n")
#print("Last words removed:", popped, "\n")
```

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In [10]:
```python
# list of n-gram models that suggested the word we were looking for
list_results = []
for i in range(len(sentnece_minus_1_for_suggestion)):
    results = []
    print("Sentence:", sentnece_minus_1_for_suggestion[i])
    print("Word we're looking for:", popped[i])
    #print(each)
    # Run each model with test set sentences
    print("Unigram model suggestions:", model.suggestions(sentnece_minus_1_for_suggestion[i]))
    print("Bigram model suggestions:", model2.suggestions(sentnece_minus_1_for_suggestion[i]))
    print("Trigram model suggestions:", model3.suggestions(sentnece_minus_1_for_suggestion[i]))
    print("Ngram model suggestions:", model4.suggestions(sentnece_minus_1_for_suggestion[i]), "\n")
    # the word we are looking for
    words = popped[i]
    # if the word is in the suggested list of 5 words add to list of results
    if (any(words in i for i in model.suggestions(sentnece_minus_1_for_suggestion[i]))):
        results.append("Unigram")
    if (any(words in i for i in model2.suggestions(sentnece_minus_1_for_suggestion[i]))):
```

```python
            results.append("Bigram")
        if (any(words in i for i in model3.suggestions(sentnece_minus_1_for_suggestion[i]))):
            results.append("Trigram")
        if (any(words in i for i in model4.suggestions(sentnece_minus_1_for_suggestion[i]))):
            results.append("Ngram")
    list_results.append(results)
# lists to hold the count of each n-gram size
uni = []
bi = []
tri = []
ngram = []
all_ngrams = []
for each in list_results:
    uni_count = each.count("Unigram")
    bi_count = each.count("Bigram")
    tri_count = each.count("Trigram")
    ngram_count = each.count("Ngram")
    uni.append(uni_count)
    bi.append(bi_count)
    tri.append(tri_count)
    ngram.append(ngram_count)
# choices to return for which n-gram has the highest talley
choices = ["Unigram", "Bigram", "Trigram", "Ngram"]
all_ngrams.append(uni.count(1))
all_ngrams.append(bi.count(1))
all_ngrams.append(tri.count(1))
all_ngrams.append(ngram.count(1))
```

```
Sentence: ['what', 'slows', 'down', 'the', 'flow', 'of']
Word we're looking for: blood
Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
Bigram model suggestions: (['blood', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['blood', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['blood', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'is', 'the', 'county', 'for', 'grand', 'rapids']
Word we're looking for: mn
Unigram model suggestions: ([',', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: ([',', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([',', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([',', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'is']
Word we're looking for: ruclip
Unigram model suggestions: (['the', 'a', 'an', 'ruclip', 'sugar'],)
Bigram model suggestions: (['the', 'a', 'an', 'ruclip', 'wifi'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['what', 'do', 'you', 'do', 'when', 'you', 'have', 'a', 'nosebleed', 'from', 'having', 'your']
Word we're looking for: nose
Unigram model suggestions: (['nose', 'body', 'bachelor', 'what', 'slows'],)
Bigram model suggestions: (['nose', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['nose', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['nose', 'what', 'slows', 'down', 'the'],)

Sentence: ['where', 'is', 'sugar', 'lake', 'lodge']
Word we're looking for: located
Unigram model suggestions: (['located', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['located', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['located', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['located', 'what', 'slows', 'down', 'the'],)

Sentence: ['where', 'is', 'steph', 'currys', 'home', 'in']
Word we're looking for: nc
Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
Bigram model suggestions: (['nc', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['nc', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['nc', 'what', 'slows', 'down', 'the'],)

Sentence: ['iur']
Word we're looking for: definition
Unigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: ([],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)
```

Sentence: ['meaning', 'of', 'heat']
Word we're looking for: capacity
Unigram model suggestions: (['capacity', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['capacity', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['capacity', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['synonym', 'for']
Word we're looking for: treatment
Unigram model suggestions: (['grand', 'a', 'in', 'treatment', '?'],)
Bigram model suggestions: (['treatment', 'thoracic', 'what', 'slows', 'down'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['what', 'party', 'is', 'paul', 'ryan']
Word we're looking for: in
Unigram model suggestions: (['in', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['in', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['in', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['in', 'what', 'slows', 'down', 'the'],)

Sentence: ['cast', 'of', 'sky', 'captain', 'and', 'the', 'world', 'of']
Word we're looking for: tomorrow
Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
Bigram model suggestions: (['tomorrow', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['tomorrow', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['tomorrow', 'what', 'slows', 'down', 'the'],)

Sentence: ['foods', 'to', 'detox', 'liver']
Word we're looking for: naturally
Unigram model suggestions: (['naturally', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['naturally', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['naturally', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['naturally', 'what', 'slows', 'down', 'the'],)

Sentence: ['sops']
Word we're looking for: policy
Unigram model suggestions: ([],)
Bigram model suggestions: ([],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['what', 'origin', 'is', 'the', 'last', 'name']
Word we're looking for: goins
Unigram model suggestions: (['goins', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['goins', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['goins', 'what', 'slows', 'down', 'the'],)

```
                     Ngram model suggestions: (['goins', 'what', 'slows', 'down', 'the'],)

       Sentence: ['how', 'long', 'is', 'recovery', 'from', 'a', 'face', 'lift', 'and', 'neck']
       Word we're looking for: lift
       Unigram model suggestions: (['lift', 'what', 'slows', 'down', 'the'],)
       Bigram model suggestions: (['lift', 'what', 'slows', 'down', 'the'],)
       Trigram model suggestions: (['lift', 'what', 'slows', 'down', 'the'],)
       Ngram model suggestions: (['lift', 'what', 'slows', 'down', 'the'],)

       Sentence: ['what', 'type', 'of', 'movement', 'do', 'bacteria']
       Word we're looking for: exhibit
       Unigram model suggestions: (['exhibit', 'what', 'slows', 'down', 'the'],)
       Bigram model suggestions: (['exhibit', 'what', 'slows', 'down', 'the'],)
       Trigram model suggestions: (['exhibit', 'what', 'slows', 'down', 'the'],)
       Ngram model suggestions: (['exhibit', 'what', 'slows', 'down', 'the'],)

       Sentence: ['is', 'prorate', 'the', 'same', 'as', 'daily']
       Word we're looking for: rate
       Unigram model suggestions: (['rate', 'life', 'what', 'slows', 'down'],)
       Bigram model suggestions: (['rate', 'what', 'slows', 'down', 'the'],)
       Trigram model suggestions: (['rate', 'what', 'slows', 'down', 'the'],)
       Ngram model suggestions: (['rate', 'what', 'slows', 'down', 'the'],)

       Sentence: ['what', 'trail', 'did', 'thousands', 'use', 'to', 'get', 'to', 'the', 'gold']
       Word we're looking for: rush
       Unigram model suggestions: (['rush', 'what', 'slows', 'down', 'the'],)
       Bigram model suggestions: (['rush', 'what', 'slows', 'down', 'the'],)
       Trigram model suggestions: (['rush', 'what', 'slows', 'down', 'the'],)
       Ngram model suggestions: (['rush', 'what', 'slows', 'down', 'the'],)

       Sentence: ['where', 'are', 'the', 'benefits', 'of', 'cinnamon', 'as', 'a']
       Word we're looking for: supplement
       Unigram model suggestions: (['nosebleed', 'synonym', 'captain', 'face', 'supplement'],)
       Bigram model suggestions: (['captain', 'supplement', 'what', 'slows', 'down'],)
       Trigram model suggestions: (['supplement', 'what', 'slows', 'down', 'the'],)
       Ngram model suggestions: (['supplement', 'what', 'slows', 'down', 'the'],)

       Sentence: ['what', 'is', 'the', 'medium', 'for', 'an']
       Word we're looking for: artisan
       Unigram model suggestions: (['artisan', 'aml', 'earthquake', 'external', 'exercised'],)
       Bigram model suggestions: (['artisan', 'what', 'slows', 'down', 'the'],)
       Trigram model suggestions: (['artisan', 'what', 'slows', 'down', 'the'],)
       Ngram model suggestions: (['artisan', 'what', 'slows', 'down', 'the'],)

       Sentence: ['do', 'goldfish']
       Word we're looking for: grow
       Unigram model suggestions: (['grow', 'what', 'slows', 'down', 'the'],)
       Bigram model suggestions: (['grow', 'what', 'slows', 'down', 'the'],)
```

```
                    Trigram model suggestions: ([],)
                    Ngram model suggestions: ([],)

                    Sentence: ['truncating']
                    Word we're looking for: meaning
                    Unigram model suggestions: (['meaning', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: ([],)
                    Trigram model suggestions: ([],)
                    Ngram model suggestions: ([],)

                    Sentence: ['what', 'is', 'wifi', 'vs']
                    Word we're looking for: bluetooth
                    Unigram model suggestions: (['bluetooth', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['bluetooth', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['bluetooth', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['bluetooth', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['who', 'was', 'the', 'first', 'steam', 'boat']
                    Word we're looking for: operator
                    Unigram model suggestions: (['operator', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['operator', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['operator', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['operator', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['has', 'trump', 'ever', 'said', 'individual', 'us', 'tax', 'rate', 'highest', 'in']
                    Word we're looking for: world
                    Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
                    Bigram model suggestions: (['world', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['world', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['world', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['what', 'is', 'the', 'national']
                    Word we're looking for: convention
                    Unigram model suggestions: (['convention', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['convention', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['convention', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['convention', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['why', 'did', 'the', 'us', 'volunterilay', 'enter']
                    Word we're looking for: ww1
                    Unigram model suggestions: (['ww1', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['ww1', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['ww1', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['ww1', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['which', 'units', 'can', 'be', 'used', 'to', 'express']
                    Word we're looking for: force
                    Unigram model suggestions: (['force', 'what', 'slows', 'down', 'the'],)
```

```
            Bigram model suggestions: (['force', 'what', 'slows', 'down', 'the'],)
            Trigram model suggestions: (['force', 'what', 'slows', 'down', 'the'],)
            Ngram model suggestions: (['force', 'what', 'slows', 'down', 'the'],)

            Sentence: ['irs', 'gov', 'schedule']
            Word we're looking for: d
            Unigram model suggestions: (['d', 'what', 'slows', 'down', 'the'],)
            Bigram model suggestions: ([],)
            Trigram model suggestions: ([],)
            Ngram model suggestions: ([],)

            Sentence: ['javascript', 'how', 'capitalize', 'the', 'first', 'letter', 'of', 'a']
            Word we're looking for: string
            Unigram model suggestions: (['nosebleed', 'synonym', 'captain', 'face', 'supplement'],)
            Bigram model suggestions: (['first', 'string', 'market', 'trapezoid', 'sigmet'],)
            Trigram model suggestions: (['string', 'what', 'slows', 'down', 'the'],)
            Ngram model suggestions: (['string', 'what', 'slows', 'down', 'the'],)

            Sentence: ['port', 'orange', 'what']
            Word we're looking for: county
            Unigram model suggestions: (['is', 'are', 'does', 'type', 'causes'],)
            Bigram model suggestions: (['county', 'what', 'slows', 'down', 'the'],)
            Trigram model suggestions: (['county', 'what', 'slows', 'down', 'the'],)
            Ngram model suggestions: ([],)

            Sentence: ['who', 'noncommunicable']
            Word we're looking for: diseases
            Unigram model suggestions: (['diseases', 'what', 'slows', 'down', 'the'],)
            Bigram model suggestions: (['diseases', 'what', 'slows', 'down', 'the'],)
            Trigram model suggestions: ([],)
            Ngram model suggestions: ([],)

            Sentence: ['the', 'quad']
            Word we're looking for: cast
            Unigram model suggestions: (['cast', 'what', 'slows', 'down', 'the'],)
            Bigram model suggestions: (['cast', 'what', 'slows', 'down', 'the'],)
            Trigram model suggestions: ([],)
            Ngram model suggestions: ([],)

            Sentence: ['what', 'type', 'of', 'work', 'is']
            Word we're looking for: barbering
            Unigram model suggestions: (['the', 'a', 'an', 'ruclip', 'sugar'],)
            Bigram model suggestions: (['barbering', 'what', 'slows', 'down', 'the'],)
            Trigram model suggestions: (['barbering', 'what', 'slows', 'down', 'the'],)
            Ngram model suggestions: (['barbering', 'what', 'slows', 'down', 'the'],)

            Sentence: ['definition', 'declaratory']
            Word we're looking for: judgment
```

```
                  Unigram model suggestions: (['judgment', 'what', 'slows', 'down', 'the'],)
                  Bigram model suggestions: (['judgment', 'what', 'slows', 'down', 'the'],)
                  Trigram model suggestions: ([],)
                  Ngram model suggestions: ([],)

                  Sentence: ['ben', 'foster', 'footballer', 'net']
                  Word we're looking for: worth
                  Unigram model suggestions: (['worth', 'what', 'slows', 'down', 'the'],)
                  Bigram model suggestions: (['worth', 'what', 'slows', 'down', 'the'],)
                  Trigram model suggestions: (['worth', 'what', 'slows', 'down', 'the'],)
                  Ngram model suggestions: (['worth', 'what', 'slows', 'down', 'the'],)

                  Sentence: ['edward', 'jones', 'phone']
                  Word we're looking for: number
                  Unigram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)
                  Bigram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)
                  Trigram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)
                  Ngram model suggestions: ([],)

                  Sentence: ['pollen', 'is', 'found', 'on', 'what', 'part', 'of', 'the', 'a']
                  Word we're looking for: flower
                  Unigram model suggestions: (['nosebleed', 'synonym', 'captain', 'face', 'supplement'],)
                  Bigram model suggestions: (['flower', 'what', 'slows', 'down', 'the'],)
                  Trigram model suggestions: (['flower', 'what', 'slows', 'down', 'the'],)
                  Ngram model suggestions: (['flower', 'what', 'slows', 'down', 'the'],)

                  Sentence: ['what', 'does', 'pk', 'nail', 'stand', 'for', 'in']
                  Word we're looking for: survey
                  Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
                  Bigram model suggestions: (['survey', 'what', 'slows', 'down', 'the'],)
                  Trigram model suggestions: (['survey', 'what', 'slows', 'down', 'the'],)
                  Ngram model suggestions: (['survey', 'what', 'slows', 'down', 'the'],)

                  Sentence: ['how', 'far', 'prior', 'to', 'wedding', 'should', 'you', 'mail', 'out']
                  Word we're looking for: invitations
                  Unigram model suggestions: (['invitations', 'what', 'slows', 'down', 'the'],)
                  Bigram model suggestions: (['invitations', 'what', 'slows', 'down', 'the'],)
                  Trigram model suggestions: (['invitations', 'what', 'slows', 'down', 'the'],)
                  Ngram model suggestions: (['invitations', 'what', 'slows', 'down', 'the'],)

                  Sentence: ['what', 'does', 'production', 'design']
                  Word we're looking for: entail
                  Unigram model suggestions: (['entail', 'what', 'slows', 'down', 'the'],)
                  Bigram model suggestions: (['entail', 'what', 'slows', 'down', 'the'],)
                  Trigram model suggestions: (['entail', 'what', 'slows', 'down', 'the'],)
                  Ngram model suggestions: (['entail', 'what', 'slows', 'down', 'the'],)

                  Sentence: ['which', 'is', 'the', 'definition', 'of', 'a', 'market', 'in', 'the', 'study', 'of']
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                   Word we're looking for: economics
                   Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
                   Bigram model suggestions: (['economics', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['economics', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['economics', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['right', 'pelvic', 'pain']
                   Word we're looking for: causes
                   Unigram model suggestions: (['causes', 'what', 'slows', 'down', 'the'],)
                   Bigram model suggestions: (['causes', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['causes', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: ([],)

                   Sentence: ['what', 'does', 'e', 'pluribus', 'unum', 'mean', 'in']
                   Word we're looking for: latin
                   Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
                   Bigram model suggestions: (['latin', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['latin', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['latin', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['what', 'are', 'the', 'social', 'determinants', 'of']
                   Word we're looking for: health
                   Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
                   Bigram model suggestions: (['health', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['health', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['health', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['what', 'contains', 'specific', 'instructions', 'that', 'make', 'each', 'living', 'thing']
                   Word we're looking for: unique
                   Unigram model suggestions: (['unique', 'what', 'slows', 'down', 'the'],)
                   Bigram model suggestions: (['unique', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['unique', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['unique', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['what', 'county', 'is', 'pontiac', 'illinois']
                   Word we're looking for: in
                   Unigram model suggestions: (['in', 'what', 'slows', 'down', 'the'],)
                   Bigram model suggestions: ([],)
                   Trigram model suggestions: ([],)
                   Ngram model suggestions: ([],)

                   Sentence: ['what', 'are', 'the', 'three', 'distinct', 'layers', 'of', 'the']
                   Word we're looking for: earth
                   Unigram model suggestions: (['first', 'three', 'flow', 'county', 'a'],)
                   Bigram model suggestions: (['a', 'earth', 'state', 'what', 'slows'],)
                   Trigram model suggestions: (['earth', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['earth', 'what', 'slows', 'down', 'the'],)
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Sentence: ['who', 'was', 'the', 'first', 'africanamerican', 'to', 'win']
Word we're looking for: wimbledon
Unigram model suggestions: (['wimbledon', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['wimbledon', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['sensibilities']
Word we're looking for: definition
Unigram model suggestions: ([',', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: ([],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['noct']
Word we're looking for: temperature
Unigram model suggestions: (['temperature', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: ([],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['does', 'legionella', 'pneumophila', 'cause']
Word we're looking for: pneumonia
Unigram model suggestions: (['pneumonia', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['pneumonia', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['pneumonia', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['pneumonia', 'what', 'slows', 'down', 'the'],)

Sentence: ['cost', 'for']
Word we're looking for: cremation
Unigram model suggestions: (['grand', 'a', 'in', 'treatment', '?'],)
Bigram model suggestions: (['cremation', 'square', 'jet', 'what', 'slows'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['generic', 'vivelle', 'dot']
Word we're looking for: cost
Unigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['what', 'does', 'dual']
Word we're looking for: band
Unigram model suggestions: (['band', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['band', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['band', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)
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Sentence: ['how', 'is', 'the', 'weather', 'in']
Word we're looking for: jamaica
Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
Bigram model suggestions: (['jamaica', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['jamaica', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['jamaica', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'far', 'between', 'shirleysburg', 'pa', 'and', 'newville']
Word we're looking for: pa
Unigram model suggestions: (['pa', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['pa', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['pa', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['pa', 'what', 'slows', 'down', 'the'],)

Sentence: ['is', 'the', 'titanic', 'the', 'biggest', 'ship']
Word we're looking for: ever
Unigram model suggestions: (['ever', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['ever', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['ever', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['ever', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'much', 'money', 'a', 'united', 'airline', 'get', 'as', 'a', 'captain']
Word we're looking for: pilot
Unigram model suggestions: (['and', 'pilot', 'what', 'slows', 'down'],)
Bigram model suggestions: (['pilot', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['pilot', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['pilot', 'what', 'slows', 'down', 'the'],)

Sentence: ['acura', 'integra', 'timing', 'belt', 'replacement']
Word we're looking for: cost
Unigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)

Sentence: ['function', 'of']
Word we're looking for: malt
Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
Bigram model suggestions: (['malt', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['ceramictiles', 'how', 'much', 'the', 'cost', 'for', 'square']
Word we're looking for: foot
Unigram model suggestions: (['foot', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['foot', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['foot', 'what', 'slows', 'down', 'the'],)
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Ngram model suggestions: (['foot', 'what', 'slows', 'down', 'the'],)

Sentence: ['socioemotional', 'processes']
Word we're looking for: definition
Unigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['types', 'of', 'dysarthria', 'from', 'cerebral']
Word we're looking for: palsy
Unigram model suggestions: (['palsy', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['palsy', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['palsy', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['palsy', 'what', 'slows', 'down', 'the'],)

Sentence: ['average', 'price', 'for', 'kitchen', 'cabinets']
Word we're looking for: installation
Unigram model suggestions: (['installation', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['installation', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['installation', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['installation', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'is', 'a', 'period']
Word we're looking for: calculus
Unigram model suggestions: (['calculus', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['calculus', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['calculus', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['calculus', 'what', 'slows', 'down', 'the'],)

Sentence: ['bond', 'strike']
Word we're looking for: price
Unigram model suggestions: (['price', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['price', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['why', 'was', 'the', 'sat']
Word we're looking for: developed
Unigram model suggestions: (['developed', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['developed', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['developed', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['developed', 'what', 'slows', 'down', 'the'],)

Sentence: ['ira', 'spar', 'phone']
Word we're looking for: number
Unigram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)

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                   Trigram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: ([],)

                   Sentence: ['what', 'is', 'ar']
                   Word we're looking for: balance
                   Unigram model suggestions: (['balance', 'glasses', 'what', 'slows', 'down'],)
                   Bigram model suggestions: (['balance', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['balance', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: ([],)

                   Sentence: ['biggest', 'house', 'you', 'can', 'buy', 'in']
                   Word we're looking for: skyrim
                   Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
                   Bigram model suggestions: (['skyrim', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['skyrim', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['skyrim', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['definition', 'of', 'a', 'first']
                   Word we're looking for: harmonic
                   Unigram model suggestions: (['steam', 'letter', 'african-american', 'harmonic', 'what'],)
                   Bigram model suggestions: (['harmonic', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['harmonic', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['harmonic', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['who', 'is', 'robert']
                   Word we're looking for: gray
                   Unigram model suggestions: (['gray', 'what', 'slows', 'down', 'the'],)
                   Bigram model suggestions: (['gray', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['gray', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: ([],)

                   Sentence: ['what', 'types', 'of', 'food', 'can', 'you', 'cook', 'sous']
                   Word we're looking for: vide
                   Unigram model suggestions: (['vide', 'what', 'slows', 'down', 'the'],)
                   Bigram model suggestions: (['vide', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['vide', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['vide', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['how', 'long', 'is', 'life', 'cycle', 'of']
                   Word we're looking for: flea
                   Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
                   Bigram model suggestions: (['flea', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['flea', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['flea', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['what', 'can', 'contour', 'plowing']
                   Word we're looking for: reduce
                   Unigram model suggestions: (['reduce', 'what', 'slows', 'down', 'the'],)
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                   Bigram model suggestions: (['reduce', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['reduce', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['reduce', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['when', 'was', 'the', 'salvation', 'army']
                   Word we're looking for: founded
                   Unigram model suggestions: (['founded', 'what', 'slows', 'down', 'the'],)
                   Bigram model suggestions: (['founded', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['founded', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['founded', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['what', 'is', 'a', 'active']
                   Word we're looking for: margin
                   Unigram model suggestions: (['margin', 'what', 'slows', 'down', 'the'],)
                   Bigram model suggestions: (['margin', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['margin', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['margin', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['what', 'is']
                   Word we're looking for: epicureanism
                   Unigram model suggestions: (['the', 'a', 'an', 'ruclip', 'sugar'],)
                   Bigram model suggestions: (['the', 'a', 'an', 'ruclip', 'wifi'],)
                   Trigram model suggestions: ([],)
                   Ngram model suggestions: ([],)

                   Sentence: ['how', 'many', 'calories', 'in', 'tablespoon']
                   Word we're looking for: mayonnaise
                   Unigram model suggestions: (['mayonnaise', 'what', 'slows', 'down', 'the'],)
                   Bigram model suggestions: (['mayonnaise', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['mayonnaise', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['mayonnaise', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['what', 'is', 'ftl']
                   Word we're looking for: games
                   Unigram model suggestions: (['games', 'what', 'slows', 'down', 'the'],)
                   Bigram model suggestions: (['games', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['games', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: ([],)

                   Sentence: ['which', 'numbers', 'are', 'the', 'account', 'number', 'on', 'the']
                   Word we're looking for: check
                   Unigram model suggestions: (['first', 'three', 'flow', 'county', 'a'],)
                   Bigram model suggestions: (['check', 'what', 'slows', 'down', 'the'],)
                   Trigram model suggestions: (['check', 'what', 'slows', 'down', 'the'],)
                   Ngram model suggestions: (['check', 'what', 'slows', 'down', 'the'],)

                   Sentence: ['chicco', 'pocket', 'snack', 'booster', 'seat']
                   Word we're looking for: grey
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Unigram model suggestions: ([',', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: ([',', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([',', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([',', 'what', 'slows', 'down', 'the'],)

Sentence: ['difference', 'between', 'rn', 'and']
Word we're looking for: bsn
Unigram model suggestions: (['the', 'a', 'neck', 'newville', 'bsn'],)
Bigram model suggestions: (['bsn', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['bsn', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['bsn', 'what', 'slows', 'down', 'the'],)

Sentence: ['medicares', 'definition', 'of', 'mechanical']
Word we're looking for: ventilation
Unigram model suggestions: (['ventilation', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['ventilation', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['ventilation', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['phone', 'number', 'for', 'southwest', 'airlines', 'customer']
Word we're looking for: service
Unigram model suggestions: (['service', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['service', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['service', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['service', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'to', 'find', 'the', 'midsegment', 'of', 'a']
Word we're looking for: trapezoid
Unigram model suggestions: (['nosebleed', 'synonym', 'captain', 'face', 'supplement'],)
Bigram model suggestions: (['first', 'string', 'market', 'trapezoid', 'sigmet'],)
Trigram model suggestions: (['trapezoid', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['trapezoid', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'the', 'health']
Word we're looking for: diet
Unigram model suggestions: (['diet', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['diet', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['diet', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['what', 'is', 'an', 'aml', 'surveillance']
Word we're looking for: analyst
Unigram model suggestions: (['analyst', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['analyst', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['analyst', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['analyst', 'what', 'slows', 'down', 'the'],)

Sentence: ['which', 'is', 'a', 'certificate', 'of', 'debt', 'issued', 'by', 'corporations', 'and']
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                    Word we're looking for: governments
                    Unigram model suggestions: (['the', 'a', 'neck', 'newville', 'bsn'],)
                    Bigram model suggestions: (['governments', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['governments', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['governments', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['how', 'much', 'does', 'it', 'cost', 'to', 'go', 'to', 'alabama']
                    Word we're looking for: university
                    Unigram model suggestions: (['university', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['university', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['university', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['university', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['what', 'is', 'the', 'daily', 'life', 'of', 'thai']
                    Word we're looking for: people
                    Unigram model suggestions: (['people', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['people', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['people', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['people', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['what', 'causes', 'heavy', 'metal', 'toxins', 'in', 'your']
                    Word we're looking for: body
                    Unigram model suggestions: (['nose', 'body', 'bachelor', 'what', 'slows'],)
                    Bigram model suggestions: (['body', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['body', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['body', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['what', 'is', 'a', 'web']
                    Word we're looking for: domain
                    Unigram model suggestions: (['domain', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['domain', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['domain', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['domain', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['define']
                    Word we're looking for: apprehension
                    Unigram model suggestions: (['apprehension', 'visceral', 'what', 'slows', 'down'],)
                    Bigram model suggestions: ([],)
                    Trigram model suggestions: ([],)
                    Ngram model suggestions: ([],)

                    Sentence: ['what', 'colors', 'are', 'louisiana']
                    Word we're looking for: tech
                    Unigram model suggestions: (['tech', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['tech', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['tech', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['tech', 'what', 'slows', 'down', 'the'],)
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Sentence: ['what', 'is', 'the', 'gonstead', 'chiropractic']
Word we're looking for: technique
Unigram model suggestions: (['technique', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['technique', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['technique', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['technique', 'what', 'slows', 'down', 'the'],)

Sentence: ['toyota', 'of', 'plano', 'plano']
Word we're looking for: tx
Unigram model suggestions: (['plano', 'tx', 'what', 'slows', 'down'],)
Bigram model suggestions: (['tx', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['tx', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['tx', 'what', 'slows', 'down', 'the'],)

Sentence: ['definition', 'of', 'coining']
Word we're looking for: money
Unigram model suggestions: (['money', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['money', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['money', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['can', 'farang', 'live', 'in']
Word we're looking for: thailand
Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
Bigram model suggestions: (['thailand', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['thailand', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['thailand', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'causes', 'meteor', 'shower', 'on']
Word we're looking for: earth
Unigram model suggestions: (['what', 'the', 'an', 'earth', 'vampire'],)
Bigram model suggestions: (['earth', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['earth', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['earth', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'is', 'the', 'area', 'where', 'rock', 'under', 'stress', 'breaks', 'and', 'triggers', 'an']
Word we're looking for: earthquake
Unigram model suggestions: (['artisan', 'aml', 'earthquake', 'external', 'exercised'],)
Bigram model suggestions: (['earthquake', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['earthquake', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['earthquake', 'what', 'slows', 'down', 'the'],)

Sentence: ['average', 'sound']
Word we're looking for: bite
Unigram model suggestions: (['bite', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['bite', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)
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Sentence: ['definition', 'of', 'a']
Word we're looking for: sigmet
Unigram model suggestions: (['nosebleed', 'synonym', 'captain', 'face', 'supplement'],)
Bigram model suggestions: (['first', 'string', 'market', 'trapezoid', 'sigmet'],)
Trigram model suggestions: (['first', 'market', 'sigmet', 'what', 'slows'],)
Ngram model suggestions: ([],)

Sentence: ['cost', 'of', 'interior', 'concrete']
Word we're looking for: flooring
Unigram model suggestions: (['flooring', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['flooring', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['flooring', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['flooring', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'is', 'the', 'most', 'popular', 'food', 'in']
Word we're looking for: switzerland
Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
Bigram model suggestions: (['switzerland', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['switzerland', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['switzerland', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'are', 'some', 'sharks', 'warm']
Word we're looking for: blooded
Unigram model suggestions: (['blooded', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['blooded', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['blooded', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['blooded', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'is', 'a', 'moderator']
Word we're looking for: variable
Unigram model suggestions: (['variable', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['variable', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['variable', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['variable', 'what', 'slows', 'down', 'the'],)

Sentence: ['who', 'is']
Word we're looking for: jobu
Unigram model suggestions: (['the', 'a', 'an', 'ruclip', 'sugar'],)
Bigram model suggestions: (['robert', 'jobu', 'what', 'slows', 'down'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['how', 'long', 'to', 'hold', 'bow', 'in']
Word we're looking for: yoga
Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
Bigram model suggestions: (['yoga', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['yoga', 'what', 'slows', 'down', 'the'],)
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                    Ngram model suggestions: (['yoga', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['how', 'old', 'is']
                    Word we're looking for: kidman
                    Unigram model suggestions: (['the', 'a', 'an', 'ruclip', 'sugar'],)
                    Bigram model suggestions: (['kidman', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['kidman', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: ([],)

                    Sentence: ['honored']
                    Word we're looking for: meaning
                    Unigram model suggestions: (['meaning', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: ([],)
                    Trigram model suggestions: ([],)
                    Ngram model suggestions: ([],)

                    Sentence: ['definition', 'of']
                    Word we're looking for: tangent
                    Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
                    Bigram model suggestions: (['a', 'mechanical', 'coining', 'tangent', 'environment'],)
                    Trigram model suggestions: ([],)
                    Ngram model suggestions: ([],)

                    Sentence: ['what', 'information', 'is', 'stored', 'on', 'an', 'external', 'hard']
                    Word we're looking for: drive
                    Unigram model suggestions: (['drive', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['drive', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['drive', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['drive', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['what', 'is', 'a', 'virus', 'made']
                    Word we're looking for: of
                    Unigram model suggestions: (['of', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['of', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['of', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['of', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['what', 'is', 'durable', 'medical', 'equipment', 'consist']
                    Word we're looking for: of
                    Unigram model suggestions: (['of', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['of', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['of', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['of', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['what', 'is', 'therapy', 'that', 'explores', 'relationship']
                    Word we're looking for: problems
                    Unigram model suggestions: (['problems', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['problems', 'what', 'slows', 'down', 'the'],)
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Trigram model suggestions: (['problems', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['problems', 'what', 'slows', 'down', 'the'],)

Sentence: ['harvey', 'mudd', 'tuition']
Word we're looking for: cost
Unigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['what', 'is']
Word we're looking for: firewalk
Unigram model suggestions: (['the', 'a', 'an', 'ruclip', 'sugar'],)
Bigram model suggestions: (['the', 'a', 'an', 'ruclip', 'wifi'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['stamford', 'federal', 'credit', 'union', 'routing']
Word we're looking for: number
Unigram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['number', 'what', 'slows', 'down', 'the'],)

Sentence: ['exons', 'definition']
Word we're looking for: biology
Unigram model suggestions: (['of', 'declaratory', 'biology', 'key', 'what'],)
Bigram model suggestions: (['biology', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['what', 'does', 'velvet']
Word we're looking for: symbolize
Unigram model suggestions: (['symbolize', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['symbolize', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['symbolize', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['chevy', 'chase']
Word we're looking for: meaning
Unigram model suggestions: (['meaning', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['meaning', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['presidential']
Word we're looking for: synonym
Unigram model suggestions: (['synonym', 'what', 'slows', 'down', 'the'],)
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                      Bigram model suggestions: ([],)
                      Trigram model suggestions: ([],)
                      Ngram model suggestions: ([],)

                      Sentence: ['wat', 'is']
                      Word we're looking for: dopamine
                      Unigram model suggestions: (['the', 'a', 'an', 'ruclip', 'sugar'],)
                      Bigram model suggestions: (['dopamine', 'what', 'slows', 'down', 'the'],)
                      Trigram model suggestions: ([],)
                      Ngram model suggestions: ([],)

                      Sentence: ['define']
                      Word we're looking for: visceral
                      Unigram model suggestions: (['apprehension', 'visceral', 'what', 'slows', 'down'],)
                      Bigram model suggestions: ([],)
                      Trigram model suggestions: ([],)
                      Ngram model suggestions: ([],)

                      Sentence: ['calories', 'in', 'egg']
                      Word we're looking for: fried
                      Unigram model suggestions: (['fried', 'what', 'slows', 'down', 'the'],)
                      Bigram model suggestions: (['fried', 'what', 'slows', 'down', 'the'],)
                      Trigram model suggestions: (['fried', 'what', 'slows', 'down', 'the'],)
                      Ngram model suggestions: ([],)

                      Sentence: ['enemy', 'of', 'the', 'state', 'film']
                      Word we're looking for: cast
                      Unigram model suggestions: (['cast', 'what', 'slows', 'down', 'the'],)
                      Bigram model suggestions: (['cast', 'what', 'slows', 'down', 'the'],)
                      Trigram model suggestions: (['cast', 'what', 'slows', 'down', 'the'],)
                      Ngram model suggestions: (['cast', 'what', 'slows', 'down', 'the'],)

                      Sentence: ['what', 'is', 'amitriptyline', 'prescribed']
                      Word we're looking for: for
                      Unigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
                      Bigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
                      Trigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
                      Ngram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)

                      Sentence: ['tracheids', 'are', 'part', 'of']
                      Word we're looking for:
                      Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
                      Bigram model suggestions: (['the', '_____', 'what', 'slows', 'down'],)
                      Trigram model suggestions: (['_____', 'what', 'slows', 'down', 'the'],)
                      Ngram model suggestions: (['_____', 'what', 'slows', 'down', 'the'],)

                      Sentence: ['how', 'many', 'liberty', 'ships', 'were', 'built', 'in']
                      Word we're looking for: brunswick
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                    Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
                    Bigram model suggestions: (['brunswick', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['brunswick', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['brunswick', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['rsa', 'definition']
                    Word we're looking for: key
                    Unigram model suggestions: (['of', 'declaratory', 'biology', 'key', 'what'],)
                    Bigram model suggestions: (['key', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: ([],)
                    Ngram model suggestions: ([],)

                    Sentence: ['how', 'many', 'people', 'are', 'in', 'the']
                    Word we're looking for: peru
                    Unigram model suggestions: (['first', 'three', 'flow', 'county', 'a'],)
                    Bigram model suggestions: (['study', 'peru', 'what', 'slows', 'down'],)
                    Trigram model suggestions: (['peru', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['peru', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['what', 'is']
                    Word we're looking for: securenet
                    Unigram model suggestions: (['the', 'a', 'an', 'ruclip', 'sugar'],)
                    Bigram model suggestions: (['the', 'a', 'an', 'ruclip', 'wifi'],)
                    Trigram model suggestions: ([],)
                    Ngram model suggestions: ([],)

                    Sentence: ['who', 'formed', 'the', 'commonwealth', 'of', 'independent']
                    Word we're looking for: states
                    Unigram model suggestions: (['states', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['states', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['states', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['states', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['largest', 'hindu', 'temple']
                    Word we're looking for: nj
                    Unigram model suggestions: (['nj', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['nj', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['nj', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: ([],)

                    Sentence: ['who', 'played', 'starsky', 'and']
                    Word we're looking for: hutch
                    Unigram model suggestions: (['the', 'a', 'neck', 'newville', 'bsn'],)
                    Bigram model suggestions: (['hutch', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['hutch', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['hutch', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['when', 'will', 'the', 'next', 'eclipse']
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Word we're looking for: occur
Unigram model suggestions: (['occur', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['occur', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['occur', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['occur', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'are', 'rdw', 'in', 'blood']
Word we're looking for: work
Unigram model suggestions: (['sugar', 'work', 'what', 'slows', 'down'],)
Bigram model suggestions: (['work', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['work', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['work', 'what', 'slows', 'down', 'the'],)

Sentence: ['causes', 'of', 'left', 'ventricular']
Word we're looking for: hypertrophy
Unigram model suggestions: (['hypertrophy', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['hypertrophy', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['hypertrophy', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['hypertrophy', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'is', 'a', 'synonym', 'for']
Word we're looking for: thoracic
Unigram model suggestions: (['grand', 'a', 'in', 'treatment', '?'],)
Bigram model suggestions: (['treatment', 'thoracic', 'what', 'slows', 'down'],)
Trigram model suggestions: (['thoracic', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['thoracic', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'are', 'achieved', 'and', 'ascribed']
Word we're looking for: statuses
Unigram model suggestions: (['statuses', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['statuses', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['statuses', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['statuses', 'what', 'slows', 'down', 'the'],)

Sentence: ['lps', 'laws']
Word we're looking for: definition
Unigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['calculate', 'my', 'social', 'security', 'benefit', 'per']
Word we're looking for: month
Unigram model suggestions: (['month', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['month', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['month', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['month', 'what', 'slows', 'down', 'the'],)
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Sentence: ['what', 'is', 'an', 'exercised', 'stock']
Word we're looking for: option
Unigram model suggestions: (['option', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['option', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['option', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['option', 'what', 'slows', 'down', 'the'],)

Sentence: ['where', 'do', 'white', 'sox', 'play', 'in']
Word we're looking for: chicago
Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
Bigram model suggestions: (['chicago', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['chicago', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['chicago', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'years', 'were', 'the']
Word we're looking for: crusades
Unigram model suggestions: (['first', 'three', 'flow', 'county', 'a'],)
Bigram model suggestions: (['crusades', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['crusades', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['crusades', 'what', 'slows', 'down', 'the'],)

Sentence: ['job', 'ratio']
Word we're looking for: engineering
Unigram model suggestions: (['engineering', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['engineering', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['what', 'are', 'the', 'three']
Word we're looking for: percenters
Unigram model suggestions: (['distinct', 'percenters', 'what', 'slows', 'down'],)
Bigram model suggestions: (['distinct', 'percenters', 'what', 'slows', 'down'],)
Trigram model suggestions: (['distinct', 'percenters', 'what', 'slows', 'down'],)
Ngram model suggestions: (['distinct', 'percenters', 'what', 'slows', 'down'],)

Sentence: ['causes', 'of', 'random', 'whitehead']
Word we're looking for: outbreaks
Unigram model suggestions: (['outbreaks', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['outbreaks', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['outbreaks', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['outbreaks', 'what', 'slows', 'down', 'the'],)

Sentence: ['causes', 'of', 'military']
Word we're looking for: suicide
Unigram model suggestions: (['suicide', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['suicide', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['suicide', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)
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Sentence: ['which', 'amendment', 'protects', 'a', 'person', 'from', 'cruel', 'or', 'unusual']
Word we're looking for: punishment
Unigram model suggestions: (['punishment', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['punishment', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['punishment', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['punishment', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'is', 'atp']
Word we're looking for: produced
Unigram model suggestions: (['produced', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['produced', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['produced', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['when', 'is', 'the', 'month', 'of', 'autism']
Word we're looking for: awareness
Unigram model suggestions: (['awareness', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['awareness', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['awareness', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['awareness', 'what', 'slows', 'down', 'the'],)

Sentence: ['cost', 'for', 'jet']
Word we're looking for: fuel
Unigram model suggestions: (['fuel', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['fuel', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['fuel', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['what', 'is', 'theraderm', 'used']
Word we're looking for: for
Unigram model suggestions: (['for', 'to', 'what', 'slows', 'down'],)
Bigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'causes', 'ankle']
Word we're looking for: blisters
Unigram model suggestions: (['blisters', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['blisters', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['blisters', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['what', 'is', 'famvir', 'prescribed']
Word we're looking for: for
Unigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
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                    Ngram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)

Sentence: ['anthropological', 'definition', 'of']
Word we're looking for: environment
Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
Bigram model suggestions: (['a', 'mechanical', 'coining', 'tangent', 'environment'],)
Trigram model suggestions: (['environment', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['what', 'is']
Word we're looking for: rbrvs
Unigram model suggestions: (['the', 'a', 'an', 'ruclip', 'sugar'],)
Bigram model suggestions: (['the', 'a', 'an', 'ruclip', 'wifi'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['axon', 'terminals', 'or', 'synaptic', 'knob']
Word we're looking for: definition
Unigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'many', 'zeros', 'in', 'one']
Word we're looking for: septillion
Unigram model suggestions: (['septillion', 'day', 'what', 'slows', 'down'],)
Bigram model suggestions: (['septillion', 'day', 'what', 'slows', 'down'],)
Trigram model suggestions: (['septillion', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['septillion', 'what', 'slows', 'down', 'the'],)

Sentence: ['is', 'cdg', 'airport', 'in', 'main']
Word we're looking for: paris
Unigram model suggestions: (['paris', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['paris', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['paris', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['paris', 'what', 'slows', 'down', 'the'],)

Sentence: ['does', 'doxycycline', 'contain']
Word we're looking for: sulfa
Unigram model suggestions: (['sulfa', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['sulfa', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['sulfa', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['when', 'is', 'the']
Word we're looking for: evening
Unigram model suggestions: (['first', 'three', 'flow', 'county', 'a'],)
Bigram model suggestions: (['county', 'definition', 'last', 'daily', 'medium'],)
```

```
                    Trigram model suggestions: (['month', 'evening', 'what', 'slows', 'down'],)
                    Ngram model suggestions: ([],)

                    Sentence: ['what', 'is', 'lmt']
                    Word we're looking for: stocks
                    Unigram model suggestions: (['stocks', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['stocks', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['stocks', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: ([],)

                    Sentence: ['when', 'shazam', 'movie']
                    Word we're looking for: released
                    Unigram model suggestions: (['released', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['released', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['released', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: ([],)

                    Sentence: ['melanoma', 'skin', 'cancer']
                    Word we're looking for: symptoms
                    Unigram model suggestions: (['symptoms', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['symptoms', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['symptoms', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: ([],)

                    Sentence: ['what', 'level', 'for']
                    Word we're looking for: banish
                    Unigram model suggestions: (['grand', 'a', 'in', 'treatment', '?'],)
                    Bigram model suggestions: (['banish', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['banish', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: ([],)

                    Sentence: ['who', 'plays', 'dr', 'fell', 'on', 'vampire']
                    Word we're looking for: diaries
                    Unigram model suggestions: (['diaries', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['diaries', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['diaries', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: ([],)

                    Sentence: ['how', 'much', 'do', 'it', 'cost', 'to', 'get', 'your', 'bachelor', 'degree']
                    Word we're looking for: online
                    Unigram model suggestions: (['online', 'what', 'slows', 'down', 'the'],)
                    Bigram model suggestions: (['online', 'what', 'slows', 'down', 'the'],)
                    Trigram model suggestions: (['online', 'what', 'slows', 'down', 'the'],)
                    Ngram model suggestions: (['online', 'what', 'slows', 'down', 'the'],)

                    Sentence: ['what', 'age', 'do', 'you', 'need', 'to', 'get', 'prostate']
                    Word we're looking for: check
                    Unigram model suggestions: (['check', 'what', 'slows', 'down', 'the'],)
```

```
Bigram model suggestions: (['check', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['check', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['check', 'what', 'slows', 'down', 'the'],)

Sentence: ['who', 'wrote', 'the', 'song', 'look', 'at', 'me', 'now']
Word we're looking for: song
Unigram model suggestions: (['song', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['song', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['song', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['song', 'what', 'slows', 'down', 'the'],)

Sentence: ['example', 'of', 'monotonic']
Word we're looking for: function
Unigram model suggestions: (['function', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['function', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['function', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['what', 'is', 'andres']
Word we're looking for: b
Unigram model suggestions: (['b', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['b', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['b', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['how', 'to', 'convert', 'figures', 'into', 'words', 'in', 'excel']
Word we're looking for: 2010
Unigram model suggestions: (['2010', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['2010', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['2010', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['2010', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'time', 'is', 'it', 'in', 'howard']
Word we're looking for: pa
Unigram model suggestions: (['pa', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['pa', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['pa', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['pa', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'many', 'people', 'use', 'google', 'in', 'one']
Word we're looking for: day
Unigram model suggestions: (['septillion', 'day', 'what', 'slows', 'down'],)
Bigram model suggestions: (['septillion', 'day', 'what', 'slows', 'down'],)
Trigram model suggestions: (['day', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['day', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'format', 'does', 'a', 'thumb', 'drive', 'need', 'to', 'be', 'for', 'a']
Word we're looking for: mac
```

```
Unigram model suggestions: (['nosebleed', 'synonym', 'captain', 'face', 'supplement'],)
Bigram model suggestions: (['mac', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['mac', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['mac', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'to', 'heal', 'muscle']
Word we're looking for: soreness
Unigram model suggestions: (['soreness', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['soreness', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['soreness', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['soreness', 'what', 'slows', 'down', 'the'],)

Sentence: ['ar', 'glasses']
Word we're looking for: definition
Unigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['what', 'does', 'electric', 'vehicle']
Word we're looking for: mean
Unigram model suggestions: (['mean', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['mean', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['mean', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['mean', 'what', 'slows', 'down', 'the'],)

Sentence: ['hilton', 'lifetime', 'diamond', 'member']
Word we're looking for: benefits
Unigram model suggestions: (['benefits', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['benefits', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['benefits', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['benefits', 'what', 'slows', 'down', 'the'],)

Sentence: ['noe']
Word we're looking for: fractures
Unigram model suggestions: (['fractures', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: ([],)
Trigram model suggestions: ([],)
Ngram model suggestions: ([],)

Sentence: ['how', 'long', 'are', 'safety', 'council', 'class', 'certification', 'good']
Word we're looking for: for
Unigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'is', 'biblioteca']
```

```
Word we're looking for: in
Unigram model suggestions: (['in', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['in', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['in', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['what', 'is', 'physical', 'description', 'of']
Word we're looking for: spruce
Unigram model suggestions: (['a', 'the', 'blood', 'having', 'heat'],)
Bigram model suggestions: (['spruce', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['spruce', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['spruce', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'are', 'hydrocarbon', 'in']
Word we're looking for: lipids
Unigram model suggestions: (['the', 'one', 'blood', 'your', 'nc'],)
Bigram model suggestions: (['lipids', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['lipids', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['lipids', 'what', 'slows', 'down', 'the'],)

Sentence: ['closed', 'ended', 'mortgage']
Word we're looking for: definition
Unigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['definition', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)

Sentence: ['hydrogen', 'is', 'a', 'liquid', 'below', 'what']
Word we're looking for: temperature
Unigram model suggestions: (['is', 'are', 'does', 'type', 'causes'],)
Bigram model suggestions: (['temperature', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['temperature', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['temperature', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'type', 'of', 'eruption', 'does', 'pavolf']
Word we're looking for: have
Unigram model suggestions: (['have', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['have', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['have', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['have', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'many', 'carbs', 'should', 'you', 'eat', 'each', 'day', 'to', 'lose']
Word we're looking for: weight
Unigram model suggestions: (['weight', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['weight', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['weight', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['weight', 'what', 'slows', 'down', 'the'],)
```

```
Sentence: ['is', 'school', 'lunch', 'tax']
Word we're looking for: deductible
Unigram model suggestions: (['rate', 'deductible', 'what', 'slows', 'down'],)
Bigram model suggestions: (['deductible', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['deductible', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['deductible', 'what', 'slows', 'down', 'the'],)

Sentence: ['symptoms', 'of', 'different', 'types', 'of', 'brain']
Word we're looking for: bleeds
Unigram model suggestions: (['bleeds', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['bleeds', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['bleeds', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['bleeds', 'what', 'slows', 'down', 'the'],)

Sentence: ['are', 'stem', 'cell', 'injections', 'fda']
Word we're looking for: approved
Unigram model suggestions: (['approved', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['approved', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['approved', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['approved', 'what', 'slows', 'down', 'the'],)

Sentence: ['difference', 'between', 'a', 'mcdouble', 'and', 'a', 'double']
Word we're looking for: cheeseburger
Unigram model suggestions: (['cheeseburger', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['cheeseburger', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['cheeseburger', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['cheeseburger', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'does', 'chs', 'stand']
Word we're looking for: for
Unigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['for', 'what', 'slows', 'down', 'the'],)

Sentence: ['what', 'are', 'the', 'effects', 'of', 'having', 'low', 'blood']
Word we're looking for: sugar
Unigram model suggestions: (['sugar', 'work', 'what', 'slows', 'down'],)
Bigram model suggestions: (['sugar', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['sugar', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['sugar', 'what', 'slows', 'down', 'the'],)

Sentence: ['how', 'much', 'is', 'a', 'us', 'postal', 'stamp']
Word we're looking for: cost
Unigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: (['cost', 'what', 'slows', 'down', 'the'],)
```

```
Sentence: ['university', 'of', 'dubuque']
Word we're looking for: enrollment
Unigram model suggestions: (['enrollment', 'what', 'slows', 'down', 'the'],)
Bigram model suggestions: (['enrollment', 'what', 'slows', 'down', 'the'],)
Trigram model suggestions: (['enrollment', 'what', 'slows', 'down', 'the'],)
Ngram model suggestions: ([],)
```

In [11]:
```python
for i in range(len(all_ngrams)):
    # return the name of the model with the highest count
    print(choices[i], all_ngrams[i])
print("\nOf all of the models the", '\033[1m' + choices[all_ngrams.index(max(all_ngrams))] + '\033[0m', "model suggest
```

```
Unigram 151
Bigram 180
Trigram 160
Ngram 124
```

Of all of the models the **Bigram** model suggests the next word correctly most often

In [12]:
```python
# Old extra testing to visualize before the above code
words_sent1_uni = model.suggestions(sentence1)
print(words_sent1_uni)
for each in words_sent1_uni:
    print(model.estimate_probability(each[0], "period"))
    print(model.estimate_probability(each[1], "period"))
    print(model.estimate_probability(each[2], "period"))
    print(model.estimate_probability(each[3], "period"))
    print(model.estimate_probability(each[4], "period"), "\n")


words_sent2_uni = model.suggestions(sentence2)
print(words_sent2_uni)
for each in words_sent2_uni:
    print(model.estimate_probability(each[0], "is"))
    print(model.estimate_probability(each[1], "is"))
    print(model.estimate_probability(each[2], "is"))
    print(model.estimate_probability(each[3], "is"))
    print(model.estimate_probability(each[4], "is"), "\n")

words_sent3_uni = model.suggestions(sentence3)
print(words_sent3_uni)
for each in words_sent3_uni:
    print(model.estimate_probability(each[0], "routing"))
    print(model.estimate_probability(each[1], "routing"))
    print(model.estimate_probability(each[2], "routing"))
    print(model.estimate_probability(each[3], "routing"))
```

```python
    print(model.estimate_probability(each[4], "routing"), "\n")

words_sent4_uni = model.suggestions(sentence4)
print(words_sent4_uni)
for each in words_sent4_uni:
    print(model.estimate_probability(each[0], "a"))
    print(model.estimate_probability(each[1], "a"))
    print(model.estimate_probability(each[2], "a"))
    print(model.estimate_probability(each[3], "a"))
    print(model.estimate_probability(each[4], "a"))
```

```
(['calculus', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016

(['the', 'a', 'an', 'ruclip', 'sugar'],)
0.020497803806734993
0.014641288433382138
0.004392386530014641
0.0029282576866764276
0.0029282576866764276

(['number', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016

(['nosebleed', 'synonym', 'captain', 'face', 'supplement'],)
0.0030816640986132513
0.0030816640986132513
0.0030816640986132513
0.0030816640986132513
0.0030816640986132513
```

In [13]:
```python
words_sent1_bi = model2.suggestions(sentence1)
print(words_sent1_bi)
for each in words_sent1_bi:
    print(model2.estimate_probability(each[0], ["a", "period"]))
    print(model2.estimate_probability(each[1], ["a", "period"]))
    print(model2.estimate_probability(each[2], ["a", "period"]))
    print(model2.estimate_probability(each[3], ["a", "period"]))
    print(model2.estimate_probability(each[4], ["a", "period"]), "\n")
```

```python
words_sent2_bi = model2.suggestions(sentence2)
print(words_sent2_bi)
for each in words_sent2_bi:
    print(model2.estimate_probability(each[0], ["wat", "is"]))
    print(model2.estimate_probability(each[1], ["wat", "is"]))
    print(model2.estimate_probability(each[2], ["wat", "is"]))
    print(model2.estimate_probability(each[3], ["wat", "is"]))
    print(model2.estimate_probability(each[4], ["wat", "is"]), "\n")

words_sent3_bi = model2.suggestions(sentence3)
print(words_sent3_bi)
for each in words_sent3_bi:
    print(model2.estimate_probability(each[0], ["union", "routing"]))
    print(model2.estimate_probability(each[1],  ["union", "routing"]))
    print(model2.estimate_probability(each[2],  ["union", "routing"]))
    print(model2.estimate_probability(each[3],  ["union", "routing"]))
    print(model2.estimate_probability(each[4],  ["union", "routing"]), "\n")

words_sent4_bi = model2.suggestions(sentence4)
print(words_sent4_bi)
for each in words_sent4_bi:
    print(model2.estimate_probability(each[0], ["for", "a"]))
    print(model2.estimate_probability(each[1],["for", "a"]))
    print(model2.estimate_probability(each[2], ["for", "a"]))
    print(model2.estimate_probability(each[3],["for", "a"]))
    print(model2.estimate_probability(each[4], ["for", "a"]))
```

```
(['calculus', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016

(['dopamine', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016

(['number', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016

(['mac', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016
```

In [14]:
```python
words_sent1_tri = model3.suggestions(sentence1)
print(words_sent1_tri)
for each in words_sent1_tri:
    print(model3.estimate_probability(each[0], ["is", "a", "period"]))
    print(model3.estimate_probability(each[1], ["is", "a", "period"]))
    print(model3.estimate_probability(each[2], ["is", "a", "period"]))
    print(model3.estimate_probability(each[3], ["is", "a", "period"]))
    print(model3.estimate_probability(each[4], ["is", "a", "period"]), "\n")

words_sent2_tri = model3.suggestions(sentence2)
print(words_sent2_tri, "\n")

words_sent3_tri = model3.suggestions(sentence3)
print(words_sent3_tri)
for each in words_sent3_tri:
    print(model3.estimate_probability(each[0], ["credit", "union", "routing"]))
    print(model3.estimate_probability(each[1], ["credit", "union", "routing"]))
    print(model3.estimate_probability(each[2], ["credit", "union", "routing"]))
    print(model3.estimate_probability(each[3], ["credit", "union", "routing"]))
    print(model3.estimate_probability(each[4], ["credit", "union", "routing"]), "\n")
```

```python
words_sent4_tri = model3.suggestions(sentence4)
print(words_sent4_tri)
for each in words_sent4_tri:
    print(model3.estimate_probability(each[0], ["be","for", "a"]))
    print(model3.estimate_probability(each[1], ["be","for", "a"]))
    print(model3.estimate_probability(each[2], ["be","for", "a"]))
    print(model3.estimate_probability(each[3], ["be","for", "a"]))
    print(model3.estimate_probability(each[4], ["be","for", "a"]))
```

```
(['calculus', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016

([],)

(['number', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016

(['mac', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016
```

In [15]:
```python
words_sent1_ngram = model4.suggestions(sentence1)
print(words_sent1_ngram)
for each in words_sent1_ngram:
    print(model4.estimate_probability(each[0], ["what", "is", "a", "period"]))
    print(model4.estimate_probability(each[1], ["what", "is", "a", "period"]))
    print(model4.estimate_probability(each[2], ["what", "is", "a", "period"]))
    print(model4.estimate_probability(each[3], ["what", "is", "a", "period"]))
    print(model4.estimate_probability(each[4], ["what", "is", "a", "period"]), "\n")


words_sent2_ngram = model4.suggestions(sentence2)
print(words_sent2_ngram, "\n")

words_sent3_ngram = model4.suggestions(sentence3)
print(words_sent3_ngram)
```

```python
for each in words_sent3_ngram:
    print(model4.estimate_probability(each[0], ["federal", "credit", "union", "routing"]))
    print(model4.estimate_probability(each[1], ["federal", "credit", "union", "routing"]))
    print(model4.estimate_probability(each[2], ["federal", "credit", "union", "routing"]))
    print(model4.estimate_probability(each[3], ["federal", "credit", "union", "routing"]))
    print(model4.estimate_probability(each[4], ["federal", "credit", "union", "routing"]), "\n")

words_sent4_ngram = model4.suggestions(sentence4)
print(words_sent4_ngram)
for each in words_sent4_ngram:
    print(model4.estimate_probability(each[0], ["to","be","for", "a"]))
    print(model4.estimate_probability(each[1], ["to","be","for", "a"]))
    print(model4.estimate_probability(each[2], ["to","be","for", "a"]))
    print(model4.estimate_probability(each[3], ["to","be","for", "a"]))
    print(model4.estimate_probability(each[4], ["to","be","for", "a"]))
```

```
(['calculus', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016

([],)

(['number', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016

(['mac', 'what', 'slows', 'down', 'the'],)
0.0032
0.0016
0.0016
0.0016
0.0016
```