Practical 4 Exercise

1. Read the first 200 letters from the "pg2554.txt" file. Remove the punctuation marks and perform morphology processing. Finally, compare the original words and the stemmed words side by side to examine the differences.

2. Given the grammar as follows, construct the parse tree of the following sentence:
   Grammar:
   S -> NP VP
   PP -> P NP
   NP -> Det N | Det AP N | Det N P | 'I'
   VP -> V NP | VP NP | V P | V P NP
   AP -> A | A A
   A -> 'quick' | 'brown' | 'lazy'
   Det -> 'an' | 'the'
   N -> 'elephant' | 'fox' | 'dog'
   V -> 'shot' | 'jumps' | 'bites'
   P -> 'in' | 'over'

   Sentence S: **the quick brown fox bites the dog**

3. Given the Syntactic Categories as follows. Construct your own grammar rules in Python and parse the following sentence. Identify the potential syntactic ambiguity.

   Sentence S: **the man saw a dog in a park**

Symbol	Meaning	Example
S	sentence	*the man walked*
NP	noun phrase	*a dog*
VP	verb phrase	*saw a park*
PP	prepositional phrase	*with a telescope*
Det	determiner	*the*
N	noun	*dog*
V	verb	*walked*
P	preposition	*in*

4. Given the raw text below. Process the text as follows:
   a. Stem the words using appropriate regex to turn the plural to singular, remove ing, etc.
   b. Remove all the stop words
   c. Determine the occurrences of wolf
   d. Find the text around wolf using concordance()

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raw  = """The little pig saw the wolf climb up on the roof and lit a
roaring fire in the fireplace and placed on it a large kettle of water.
When the wolf finally found the hole in the chimney he crawled down and
KERSPLASH right into that kettle of water and that was the end of his
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troubles with the big bad wolf. The next day the little pig invited his
mother over. She said &amp;amp;quot;You see it is just as I told you.
The way to get along in the world is to do things as well as you
can.&amp;amp;quot; Fortunately for that little pig, he learned that lesson.
And he just lived happily ever after!"""
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Reference:

Natural Language Processing with Python. *Natural Language Toolkit.* Available at http://www.nltk.org/book/ch03.html

Natural Language Processing with Python. *Natural Language Toolkit.* Available at http://www.nltk.org/book/ch05.html

Regular expression operations. *Python 3.7.8 Documentation*. Available at https://docs.python.org/3.7/library/re.html