Kadyrov_Daniel_Assignment7

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CS557 - Natural Language Processing

Group 32 - Daniel Kadyrov

1 Part 1

To get an idea about how difficult it is to unambiguously identify parts-of-speech select several words that can be a noun, verb, adjective, and adverb (see here (Links to an external site.) for instances), find their high frequency senses using WordNet, examine their definitions and example uses, and try to generate some rules for how to determine as to when they are a noun, verb, adjective, or adverb from their context.

```
[2]: words = ["back", "best", "better", "bitter", "broadside", "clean", "clear",
     ↪"close", "cod", "collect", "counter", "crisscross", "damn", "double", "down",
     ↪"even", "express", "fair", "fast", "fine", "firm", "flush", "forward",
     ↪"free", "full", "home", "jolly", "last", "light", "low", "o.k", "okay",
     ↪"out", "pat", "plain", "plumb", "plump", "pop", "prompt", "quiet", "right",
     ↪"rough", "round", "second", "short", "solo", "square", "steady", "still",
     ↪"tiptoe", "true", "upstage", "well", "wholesale", "worst", "wrong", "zigzag"]
```

1.1 Plump

```
[27]: from nltk.corpus import wordnet

      syns = wordnet.synsets("plump")

      for syn in syns:
          print(syn.pos())
          print(syn.definition())
          print(syn.lemma_names())
          print(syn.entailments())
          print(syn.hyponyms())
          print(syn.part_holonyms())
```

```
    print(syn.part_meronyms())
    # print(syn.frame_strings())
    print("----")
```

n
the sound of a sudden heavy fall
['plump']
[]
[]
[]
[]
----
v
drop sharply
['plummet', 'plump']
[]
[]
[]
[]
----
v
set (something or oneself) down with or as if with a noise
['plank', 'flump', 'plonk', 'plop', 'plunk', 'plump_down', 'plunk_down',
'plump']
[]
[]
[]
[]
----
v
make fat or plump
['fatten', 'fat', 'flesh_out', 'fill_out', 'plump', 'plump_out', 'fatten_out',
'fatten_up']
[Synset('feed.v.02')]
[]
[]
[]
----
v
give support (to) or make a choice (of) one out of a group or number
['plump', 'go']
[]
[]
[]
[]
----
s

```
sufficiently fat so as to have a pleasing fullness of figure
['chubby', 'embonpoint', 'plump']
[]
[]
[]
[]
----
r
straight down especially heavily or abruptly
['plump']
[]
[]
[]
[]
----
```

[42]:
```python
from nltk.tokenize import word_tokenize

def pos(word, sentence):
    sentence = word_tokenize(sentence)
    try:
        index = sentence.index(word)
    except:
        return "Word not in sentence"

    syns = wordnet.synsets(word)

    part = syns[0].pos()

    if index == 0:
        part = "n"
    elif sentence[index-1] == "to":
        part = "v"
    elif "ing" in word:
        part = "v"
    elif sentence[index-1] == "a" or sentence[index-1] == "the" or␣
 ↪sentence[index-1] == "an":
        try:
            if wordnet.synsets(sentence[index+1])[0].pos() == 'n':
                part = "s"
            else:
                part = "n"
        except:
            pass
    return part

sentence1 = "The berries were plump and sweet"
```

```
sentence2 = "He fell with a plump"
sentence3 = "She was a plump girl"

print(pos("plump", sentence1))
print(pos("plump", sentence2))
print(pos("plump", sentence3))
```

```
n
n
s
```

2 Part 2

See J&M 3rd Exercise 11.1 (12.1 in 2nd). Parsing with the CKY algorithm in Python is frequently used. Several Python versions are available: Simple Python statistical (CKY) parser (Links to an external site.) not explicitly mentioned in BKL, Stensaethf/CKY-Parser at https://github.com/stensaethf/CKY-Parser (Links to an external site.), with a built-in almost CNF converter, and a more capable one with epsilon productions handling at https://github.com/RobMcH/CYK-Parser (Links to an external site.). Apply them to "Book the cooks who cook the books." and the longest sentences from Assignment 2. Compare the results to the results from previous assignments. If they do not already show important intermediate results edit them so they do.

2.1 Exercise 11.1

Draw tree structures for the following ATIS phrases:

   a. Dallas

   b. from Denver

   c. after five p.m.

   d. arriving in Washington

   e. early flights

   f. all redeye flights

   g. on Thursday
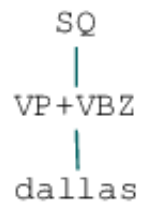
   h. a one-way fare

   i. any delays in Denver

```
[15]: from stat_parser import Parser

parser = Parser()

parser.parse("Dallas")
```
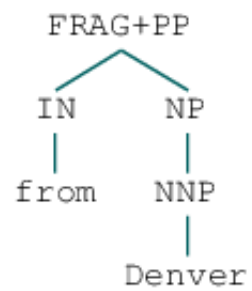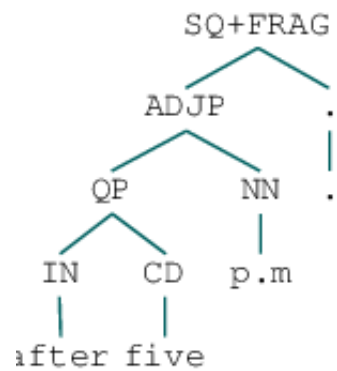
[15]:

```
         SQ
          |
        VP+VBZ
          |
        dallas
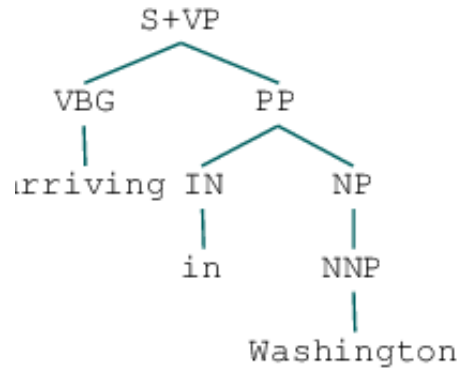```

[16]: `parser.parse("from Denver")`

[16]:

```
        FRAG+PP
        /      \
      IN        NP
       |         |
     from       NNP
                 |
               Denver
```

[17]: `parser.parse("after five p.m.")`

[17]:

```
              SQ+FRAG
             /       \
          ADJP        .
          /    \       |
        QP      NN     .
       /  \      |
     IN    CD   p.m
      |     |
    after five
```

[19]: `parser.parse("arriving in Washington")`

[19]:

```
             S+VP
          ┌────┴─────┐
         VBG          PP
          │        ┌───┴────┐
       arriving   IN        NP
                   │         │
                   in       NNP
                             │
                         Washington
```

[21]: `parser.parse("early flights")`

[21]:
```
        ADJP+ADJP
         ┌───┴───┐
        RB       JJ
         │        │
       early   flights
```

[22]: `parser.parse("on Thursday")`

[22]:
```
        FRAG+PP
        ┌───┴───┐
       IN       NP
        │        │
        on      NNP
                 │
              Thursday
```

[23]: `parser.parse("a one-way fare")`

[23]:
```
             NP+NP
        ┌──────┼──────┐
       DT      JJ      NN
        │       │       │
        a    one-way   fare
```
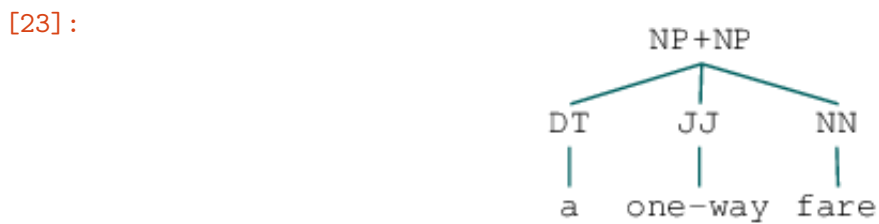
```
[24]: parser.parse("any delays in Denver")
```

[24]:

```
            SQ+VP+VP
          /          \
       NP              PP
      /  \            /  \
    DT    NN        IN    NP
    |     |         |     |
   any  delays     in    NNP
                         |
                       Denver
```
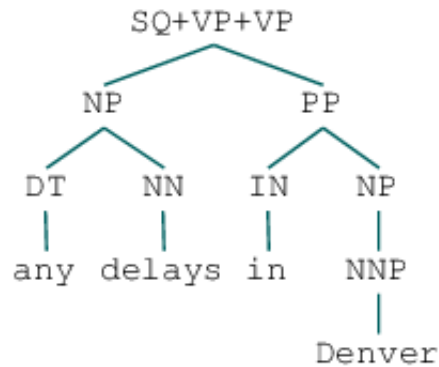
2.2 Longest Sentence

```
[3]: # From Assignment 2
     from nltk.corpus import inaugural
     from nltk.tokenize import sent_tokenize, word_tokenize

     sents = sent_tokenize(inaugural.raw())
     max_sent = max(sents, key=len)
     max_sent_toke = word_tokenize(max_sent)

     max_sent
```

[3]: 'On this subject it might become me better to be silent or to speak with
     diffidence; but as something may be expected, the occasion, I hope, will be
     admitted as an apology if I venture to say that if a preference, upon principle,
     of a free republican government, formed upon long and serious reflection, after
     a diligent and impartial inquiry after truth; if an attachment to the
     Constitution of the United States, and a conscientious determination to support
     it until it shall be altered by the judgments and wishes of the people,
     expressed in the mode prescribed in it; if a respectful attention to the
     constitutions of the individual States and a constant caution and delicacy
     toward the State governments; if an equal and impartial regard to the rights,
     interest, honor, and happiness of all the States in the Union, without
     preference or regard to a northern or southern, an eastern or western, position,
     their various political opinions on unessential points or their personal
     attachments; if a love of virtuous men of all parties and denominations; if a
     love of science and letters and a wish to patronize every rational effort to
     encourage schools, colleges, universities, academies, and every institution for

```

propagating knowledge, virtue, and religion among all classes of the people, not only for their benign influence on the happiness of life in all its stages and classes, and of society in all its forms, but as the only means of preserving our Constitution from its natural enemies, the spirit of sophistry, the spirit of party, the spirit of intrigue, the profligacy of corruption, and the pestilence of foreign influence, which is the angel of destruction to elective governments; if a love of equal laws, of justice, and humanity in the interior administration; if an inclination to improve agriculture, commerce, and manufacturers for necessity, convenience, and defense; if a spirit of equity and humanity toward the aboriginal nations of America, and a disposition to meliorate their condition by inclining them to be more friendly to us, and our citizens to be more friendly to them; if an inflexible determination to maintain peace and inviolable faith with all nations, and that system of neutrality and impartiality among the belligerent powers of Europe which has been adopted by this Government and so solemnly sanctioned by both Houses of Congress and applauded by the legislatures of the States and the public opinion, until it shall be otherwise ordained by Congress; if a personal esteem for the French nation, formed in a residence of seven years chiefly among them, and a sincere desire to preserve the friendship which has been so much for the honor and interest of both nations; if, while the conscious honor and integrity of the people of America and the internal sentiment of their own power and energies must be preserved, an earnest endeavor to investigate every just cause and remove every colorable pretense of complaint; if an intention to pursue by amicable negotiation a reparation for the injuries that have been committed on the commerce of our fellow-citizens by whatever nation, and if success can not be obtained, to lay the facts before the Legislature, that they may consider what further measures the honor and interest of the Government and its constituents demand; if a resolution to do justice as far as may depend upon me, at all times and to all nations, and maintain peace, friendship, and benevolence with all the world; if an unshaken confidence in the honor, spirit, and resources of the American people, on which I have so often hazarded my all and never been deceived; if elevated ideas of the high destinies of this country and of my own duties toward it, founded on a knowledge of the moral principles and intellectual improvements of the people deeply engraven on my mind in early life, and not obscured but exalted by experience and age; and, with humble reverence, I feel it to be my duty to add, if a veneration for the religion of a people who profess and call themselves Christians, and a fixed resolution to consider a decent respect for Christianity among the best recommendations for the public service, can enable me in any degree to comply with your wishes, it shall be my strenuous endeavor that this sagacious injunction of the two Houses shall not be without effect.'

[8]: `print(parser.parse(max_sent_toke))`

```
["ADP", "On"]
["NP+DET", "this"]
["ADJ", "subject"]
```

```
["NP+PRON", "it"]
["VERB", "might"]
["VERB", "become"]
["NP+PRON", "me"]
["ADJP+ADV", "better"]
["X+PRT", "to"]
["VERB", "be"]
["NP+INTJ+X", "silent"]
["CONJ", "or"]
["X+PRT", "to"]
["NP+INTJ+X", "speak"]
["ADP", "with"]
["NP+INTJ+X", "diffidence"]
[".", ";"]
["CONJ", "but"]
["ADP", "as"]
["NP+NOUN", "something"]
["NP+VERB", "may"]
["VERB", "be"]
["VERB", "expected"]
[".", ","]
["X+DET", "the"]
["NP+INTJ+X", "occasion"]
[".", ","]
["NP+PRON", "I"]
["NP+INTJ+X", "hope"]
[".", ","]
["VERB", "will"]
["VERB", "be"]
["NP+INTJ+X", "admitted"]
["ADP", "as"]
["DET", "an"]
["NP+INTJ+X", "apology"]
["ADP", "if"]
["NP+PRON", "I"]
["NOUN", "venture"]
["X+PRT", "to"]
["NP+INTJ+X", "say"]
["NP+ADP", "that"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "preference"]
[".", ","]
["NP+INTJ+X", "upon"]
["NP+INTJ+X", "principle"]
[".", ","]
["ADP", "of"]
["X+X", "a"]
```

```
["NP+INTJ+X", "free"]
["NP+INTJ+X", "republican"]
["NOUN", "government"]
[".", ","]
["NP+INTJ+X", "formed"]
["NP+INTJ+X", "upon"]
["ADVP+ADJ", "long"]
["CONJ", "and"]
["ADJP+ADJ", "serious"]
["NP+INTJ+X", "reflection"]
[".", ","]
["ADP", "after"]
["X+X", "a"]
["NP+INTJ+X", "diligent"]
["CONJ", "and"]
["NP+INTJ+X", "impartial"]
["NP+INTJ+X", "inquiry"]
["ADP", "after"]
["NP+INTJ+X", "truth"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "attachment"]
["X+PRT", "to"]
["X+DET", "the"]
["NP+INTJ+X", "Constitution"]
["ADP", "of"]
["X+DET", "the"]
["NOUN", "United"]
["NP+INTJ+X", "States"]
[".", ","]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "conscientious"]
["NP+INTJ+X", "determination"]
["X+PRT", "to"]
["NP+NOUN", "support"]
["NP+PRON", "it"]
["ADP", "until"]
["NP+PRON", "it"]
["NP+INTJ+X", "shall"]
["VERB", "be"]
["NP+INTJ+X", "altered"]
["ADP", "by"]
["X+DET", "the"]
["NP+INTJ+X", "judgments"]
["CONJ", "and"]
["NP+INTJ+X", "wishes"]
```

```
["ADP", "of"]
["X+DET", "the"]
["NP+NOUN", "people"]
[".", ","]
["NP+INTJ+X", "expressed"]
["ADP", "in"]
["X+DET", "the"]
["NP+INTJ+X", "mode"]
["NP+INTJ+X", "prescribed"]
["ADP", "in"]
["NP+PRON", "it"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "respectful"]
["NP+INTJ+X", "attention"]
["X+PRT", "to"]
["X+DET", "the"]
["NP+INTJ+X", "constitutions"]
["ADP", "of"]
["X+DET", "the"]
["NP+INTJ+X", "individual"]
["NP+INTJ+X", "States"]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "constant"]
["NP+NOUN", "caution"]
["CONJ", "and"]
["NP+INTJ+X", "delicacy"]
["ADP", "toward"]
["X+DET", "the"]
["NP+INTJ+X", "State"]
["NP+INTJ+X", "governments"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["ADJ", "equal"]
["CONJ", "and"]
["NP+INTJ+X", "impartial"]
["NP+INTJ+X", "regard"]
["X+PRT", "to"]
["X+DET", "the"]
["NOUN", "rights"]
[".", ","]
["NP+NOUN", "interest"]
[".", ","]
["NP+INTJ+X", "honor"]
[".", ","]
```

```
["CONJ", "and"]
["NP+INTJ+X", "happiness"]
["ADP", "of"]
["ADVP+DET", "all"]
["X+DET", "the"]
["NP+INTJ+X", "States"]
["ADP", "in"]
["X+DET", "the"]
["NOUN", "Union"]
[".", ","]
["ADP", "without"]
["NP+INTJ+X", "preference"]
["CONJ", "or"]
["NP+INTJ+X", "regard"]
["X+PRT", "to"]
["X+X", "a"]
["NP+INTJ+X", "northern"]
["CONJ", "or"]
["NP+INTJ+X", "southern"]
[".", ","]
["DET", "an"]
["NP+INTJ+X", "eastern"]
["CONJ", "or"]
["NP+INTJ+X", "western"]
[".", ","]
["NOUN", "position"]
[".", ","]
["PRON", "their"]
["NP+INTJ+X", "various"]
["ADJ", "political"]
["NP+INTJ+X", "opinions"]
["ADVP+PRT", "on"]
["NP+INTJ+X", "unessential"]
["NOUN", "points"]
["CONJ", "or"]
["PRON", "their"]
["ADJ", "personal"]
["NP+INTJ+X", "attachments"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "love"]
["ADP", "of"]
["NP+INTJ+X", "virtuous"]
["NP+NOUN", "men"]
["ADP", "of"]
["ADVP+DET", "all"]
["NP+NOUN", "parties"]
```

```
["CONJ", "and"]
["NP+INTJ+X", "denominations"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "love"]
["ADP", "of"]
["NP+INTJ+X", "science"]
["CONJ", "and"]
["NP+INTJ+X", "letters"]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "wish"]
["X+PRT", "to"]
["NP+INTJ+X", "patronize"]
["DET", "every"]
["NP+INTJ+X", "rational"]
["NOUN", "effort"]
["X+PRT", "to"]
["NP+INTJ+X", "encourage"]
["NP+INTJ+X", "schools"]
[".", ","]
["NP+INTJ+X", "colleges"]
[".", ","]
["NP+INTJ+X", "universities"]
[".", ","]
["NP+INTJ+X", "academies"]
[".", ","]
["CONJ", "and"]
["DET", "every"]
["NP+INTJ+X", "institution"]
["ADP", "for"]
["NP+INTJ+X", "propagating"]
["NP+INTJ+X", "knowledge"]
[".", ","]
["NP+INTJ+X", "virtue"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "religion"]
["ADP", "among"]
["ADVP+DET", "all"]
["NP+INTJ+X", "classes"]
["ADP", "of"]
["X+DET", "the"]
["NP+NOUN", "people"]
[".", ","]
["ADV", "not"]
["ADV", "only"]
```

```
["ADP", "for"]
["PRON", "their"]
["NP+INTJ+X", "benign"]
["NP+INTJ+X", "influence"]
["ADVP+PRT", "on"]
["X+DET", "the"]
["NP+INTJ+X", "happiness"]
["ADP", "of"]
["NOUN", "life"]
["ADP", "in"]
["ADVP+DET", "all"]
["PRON", "its"]
["NP+INTJ+X", "stages"]
["CONJ", "and"]
["NP+INTJ+X", "classes"]
[".", ","]
["CONJ", "and"]
["ADP", "of"]
["NP+INTJ+X", "society"]
["ADP", "in"]
["ADVP+DET", "all"]
["PRON", "its"]
["NP+INTJ+X", "forms"]
[".", ","]
["CONJ", "but"]
["ADP", "as"]
["X+DET", "the"]
["ADV", "only"]
["VERB", "means"]
["ADP", "of"]
["NP+INTJ+X", "preserving"]
["PRON", "our"]
["NP+INTJ+X", "Constitution"]
["ADP", "from"]
["PRON", "its"]
["NP+INTJ+X", "natural"]
["NP+INTJ+X", "enemies"]
[".", ","]
["X+DET", "the"]
["NP+INTJ+X", "spirit"]
["ADP", "of"]
["NP+INTJ+X", "sophistry"]
[".", ","]
["X+DET", "the"]
["NP+INTJ+X", "spirit"]
["ADP", "of"]
["NP+INTJ+X", "party"]
[".", ","]
```

```
["X+DET", "the"]
["NP+INTJ+X", "spirit"]
["ADP", "of"]
["NP+INTJ+X", "intrigue"]
[".", ","]
["X+DET", "the"]
["NP+INTJ+X", "profligacy"]
["ADP", "of"]
["NP+INTJ+X", "corruption"]
[".", ","]
["CONJ", "and"]
["X+DET", "the"]
["NP+INTJ+X", "pestilence"]
["ADP", "of"]
["ADJ", "foreign"]
["NP+INTJ+X", "influence"]
[".", ","]
["NP+INTJ+X", "which"]
["VERB", "is"]
["X+DET", "the"]
["NP+INTJ+X", "angel"]
["ADP", "of"]
["NP+INTJ+X", "destruction"]
["X+PRT", "to"]
["NP+INTJ+X", "elective"]
["NP+INTJ+X", "governments"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "love"]
["ADP", "of"]
["ADJ", "equal"]
["NP+INTJ+X", "laws"]
[".", ","]
["ADP", "of"]
["NP+INTJ+X", "justice"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "humanity"]
["ADP", "in"]
["X+DET", "the"]
["NP+INTJ+X", "interior"]
["NOUN", "administration"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "inclination"]
["X+PRT", "to"]
```

```
["NP+INTJ+X", "improve"]
["NP+INTJ+X", "agriculture"]
[".", ","]
["NP+INTJ+X", "commerce"]
[".", ","]
["CONJ", "and"]
["NP+NOUN", "manufacturers"]
["ADP", "for"]
["NP+INTJ+X", "necessity"]
[".", ","]
["NP+INTJ+X", "convenience"]
[".", ","]
["CONJ", "and"]
["NOUN", "defense"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "spirit"]
["ADP", "of"]
["NOUN", "equity"]
["CONJ", "and"]
["NP+INTJ+X", "humanity"]
["ADP", "toward"]
["X+DET", "the"]
["NP+INTJ+X", "aboriginal"]
["NP+INTJ+X", "nations"]
["ADP", "of"]
["NP+NOUN", "America"]
[".", ","]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "disposition"]
["X+PRT", "to"]
["NP+INTJ+X", "meliorate"]
["PRON", "their"]
["NP+INTJ+X", "condition"]
["ADP", "by"]
["NP+INTJ+X", "inclining"]
["NP+PRON", "them"]
["X+PRT", "to"]
["VERB", "be"]
["NP+ADJ", "more"]
["NP+INTJ+X", "friendly"]
["X+PRT", "to"]
["NP+PRON", "us"]
[".", ","]
["CONJ", "and"]
["PRON", "our"]
```

```
["NP+INTJ+X", "citizens"]
["X+PRT", "to"]
["VERB", "be"]
["NP+ADJ", "more"]
["NP+INTJ+X", "friendly"]
["X+PRT", "to"]
["NP+PRON", "them"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "inflexible"]
["NP+INTJ+X", "determination"]
["X+PRT", "to"]
["NP+INTJ+X", "maintain"]
["NP+INTJ+X", "peace"]
["CONJ", "and"]
["NP+INTJ+X", "inviolable"]
["NP+INTJ+X", "faith"]
["ADP", "with"]
["ADVP+DET", "all"]
["NP+INTJ+X", "nations"]
[".", ","]
["CONJ", "and"]
["NP+ADP", "that"]
["NOUN", "system"]
["ADP", "of"]
["NP+INTJ+X", "neutrality"]
["CONJ", "and"]
["NP+INTJ+X", "impartiality"]
["ADP", "among"]
["X+DET", "the"]
["NP+INTJ+X", "belligerent"]
["NP+INTJ+X", "powers"]
["ADP", "of"]
["NP+NOUN", "Europe"]
["NP+INTJ+X", "which"]
["VERB", "has"]
["VERB", "been"]
["NP+INTJ+X", "adopted"]
["ADP", "by"]
["NP+DET", "this"]
["NP+INTJ+X", "Government"]
["CONJ", "and"]
["ADJP+ADV", "so"]
["NP+INTJ+X", "solemnly"]
["NP+INTJ+X", "sanctioned"]
["ADP", "by"]
["NP+DET", "both"]
```

```
["NP+INTJ+X", "Houses"]
["ADP", "of"]
["NP+NOUN", "Congress"]
["CONJ", "and"]
["NP+INTJ+X", "applauded"]
["ADP", "by"]
["X+DET", "the"]
["NP+INTJ+X", "legislatures"]
["ADP", "of"]
["X+DET", "the"]
["NP+INTJ+X", "States"]
["CONJ", "and"]
["X+DET", "the"]
["ADJP+ADJ", "public"]
["NP+INTJ+X", "opinion"]
[".", ","]
["ADP", "until"]
["NP+PRON", "it"]
["NP+INTJ+X", "shall"]
["VERB", "be"]
["NP+INTJ+X", "otherwise"]
["NP+INTJ+X", "ordained"]
["ADP", "by"]
["NP+NOUN", "Congress"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["ADJ", "personal"]
["NP+INTJ+X", "esteem"]
["ADP", "for"]
["X+DET", "the"]
["ADJ", "French"]
["NOUN", "nation"]
[".", ","]
["NP+INTJ+X", "formed"]
["ADP", "in"]
["X+X", "a"]
["NP+INTJ+X", "residence"]
["ADP", "of"]
["NUM", "seven"]
["NOUN", "years"]
["NP+INTJ+X", "chiefly"]
["ADP", "among"]
["NP+PRON", "them"]
[".", ","]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "sincere"]
```

```
["NP+INTJ+X", "desire"]
["X+PRT", "to"]
["NP+INTJ+X", "preserve"]
["X+DET", "the"]
["NP+INTJ+X", "friendship"]
["NP+INTJ+X", "which"]
["VERB", "has"]
["VERB", "been"]
["ADJP+ADV", "so"]
["NP+ADJ", "much"]
["ADP", "for"]
["X+DET", "the"]
["NP+INTJ+X", "honor"]
["CONJ", "and"]
["NP+NOUN", "interest"]
["ADP", "of"]
["NP+DET", "both"]
["NP+INTJ+X", "nations"]
[".", ";"]
["ADP", "if"]
[".", ","]
["ADP", "while"]
["X+DET", "the"]
["NP+INTJ+X", "conscious"]
["NP+INTJ+X", "honor"]
["CONJ", "and"]
["NP+INTJ+X", "integrity"]
["ADP", "of"]
["X+DET", "the"]
["NP+NOUN", "people"]
["ADP", "of"]
["NP+NOUN", "America"]
["CONJ", "and"]
["X+DET", "the"]
["NP+INTJ+X", "internal"]
["NP+INTJ+X", "sentiment"]
["ADP", "of"]
["PRON", "their"]
["ADJ", "own"]
["NOUN", "power"]
["CONJ", "and"]
["NP+INTJ+X", "energies"]
["VERB", "must"]
["VERB", "be"]
["NP+INTJ+X", "preserved"]
[".", ","]
["DET", "an"]
["NP+INTJ+X", "earnest"]
```

```
["NP+INTJ+X", "endeavor"]
["X+PRT", "to"]
["NP+INTJ+X", "investigate"]
["DET", "every"]
["ADVP+ADV", "just"]
["VERB", "cause"]
["CONJ", "and"]
["NP+INTJ+X", "remove"]
["DET", "every"]
["NP+INTJ+X", "colorable"]
["NP+INTJ+X", "pretense"]
["ADP", "of"]
["NP+INTJ+X", "complaint"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "intention"]
["X+PRT", "to"]
["NP+INTJ+X", "pursue"]
["ADP", "by"]
["NP+INTJ+X", "amicable"]
["NP+INTJ+X", "negotiation"]
["X+X", "a"]
["NP+INTJ+X", "reparation"]
["ADP", "for"]
["X+DET", "the"]
["NP+INTJ+X", "injuries"]
["NP+ADP", "that"]
["VERB", "have"]
["VERB", "been"]
["NP+INTJ+X", "committed"]
["ADVP+PRT", "on"]
["X+DET", "the"]
["NP+INTJ+X", "commerce"]
["ADP", "of"]
["PRON", "our"]
["NP+INTJ+X", "fellow-citizens"]
["ADP", "by"]
["NP+INTJ+X", "whatever"]
["NOUN", "nation"]
[".", ","]
["CONJ", "and"]
["ADP", "if"]
["NP+NOUN", "success"]
["VERB", "can"]
["ADV", "not"]
["VERB", "be"]
["NP+INTJ+X", "obtained"]
```

```
[".", ","]
["X+PRT", "to"]
["NP+INTJ+X", "lay"]
["X+DET", "the"]
["NP+INTJ+X", "facts"]
["ADVP+ADP", "before"]
["X+DET", "the"]
["NP+INTJ+X", "Legislature"]
[".", ","]
["NP+ADP", "that"]
["NP+PRON", "they"]
["NP+VERB", "may"]
["NP+INTJ+X", "consider"]
["NP+INTJ+X", "what"]
["ADVP+ADV", "further"]
["NP+INTJ+X", "measures"]
["X+DET", "the"]
["NP+INTJ+X", "honor"]
["CONJ", "and"]
["NP+NOUN", "interest"]
["ADP", "of"]
["X+DET", "the"]
["NP+INTJ+X", "Government"]
["CONJ", "and"]
["PRON", "its"]
["NP+INTJ+X", "constituents"]
["NP+VERB", "demand"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "resolution"]
["X+PRT", "to"]
["VERB", "do"]
["NP+INTJ+X", "justice"]
["ADP", "as"]
["ADV", "far"]
["ADP", "as"]
["NP+VERB", "may"]
["NP+INTJ+X", "depend"]
["NP+INTJ+X", "upon"]
["NP+PRON", "me"]
[".", ","]
["X+ADP", "at"]
["ADVP+DET", "all"]
["CONJ", "times"]
["CONJ", "and"]
["X+PRT", "to"]
["ADVP+DET", "all"]
```

```
["NP+INTJ+X", "nations"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "maintain"]
["NP+INTJ+X", "peace"]
[".", ","]
["NP+INTJ+X", "friendship"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "benevolence"]
["ADP", "with"]
["ADVP+DET", "all"]
["X+DET", "the"]
["NOUN", "world"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "unshaken"]
["NP+INTJ+X", "confidence"]
["ADP", "in"]
["X+DET", "the"]
["NP+INTJ+X", "honor"]
[".", ","]
["NP+INTJ+X", "spirit"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "resources"]
["ADP", "of"]
["X+DET", "the"]
["ADJ", "American"]
["NP+NOUN", "people"]
[".", ","]
["ADVP+PRT", "on"]
["NP+INTJ+X", "which"]
["NP+PRON", "I"]
["VERB", "have"]
["ADJP+ADV", "so"]
["ADVP+ADV", "often"]
["NP+INTJ+X", "hazarded"]
["PRON", "my"]
["ADVP+DET", "all"]
["CONJ", "and"]
["ADVP+ADV", "never"]
["VERB", "been"]
["NP+INTJ+X", "deceived"]
[".", ";"]
["ADP", "if"]
["NP+INTJ+X", "elevated"]
```

```
["NP+INTJ+X", "ideas"]
["ADP", "of"]
["X+DET", "the"]
["ADJP+ADV", "high"]
["NP+INTJ+X", "destinies"]
["ADP", "of"]
["NP+DET", "this"]
["NP+NOUN", "country"]
["CONJ", "and"]
["ADP", "of"]
["PRON", "my"]
["ADJ", "own"]
["NP+INTJ+X", "duties"]
["ADP", "toward"]
["NP+PRON", "it"]
[".", ","]
["NP+INTJ+X", "founded"]
["ADVP+PRT", "on"]
["X+X", "a"]
["NP+INTJ+X", "knowledge"]
["ADP", "of"]
["X+DET", "the"]
["NP+INTJ+X", "moral"]
["NP+INTJ+X", "principles"]
["CONJ", "and"]
["NP+INTJ+X", "intellectual"]
["NP+INTJ+X", "improvements"]
["ADP", "of"]
["X+DET", "the"]
["NP+NOUN", "people"]
["NP+INTJ+X", "deeply"]
["NP+INTJ+X", "engraven"]
["ADVP+PRT", "on"]
["PRON", "my"]
["NP+INTJ+X", "mind"]
["ADP", "in"]
["ADJ", "early"]
["NOUN", "life"]
[".", ","]
["CONJ", "and"]
["ADV", "not"]
["NP+INTJ+X", "obscured"]
["CONJ", "but"]
["NP+INTJ+X", "exalted"]
["ADP", "by"]
["NP+NOUN", "experience"]
["CONJ", "and"]
["NP+NOUN", "age"]
```

```
[".", ";"]
["CONJ", "and"]
[".", ","]
["ADP", "with"]
["NP+INTJ+X", "humble"]
["NP+INTJ+X", "reverence"]
[".", ","]
["NP+PRON", "I"]
["VERB", "feel"]
["NP+PRON", "it"]
["X+PRT", "to"]
["VERB", "be"]
["PRON", "my"]
["NP+INTJ+X", "duty"]
["X+PRT", "to"]
["NP+INTJ+X", "add"]
[".", ","]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "veneration"]
["ADP", "for"]
["X+DET", "the"]
["NP+INTJ+X", "religion"]
["ADP", "of"]
["X+X", "a"]
["NP+NOUN", "people"]
["NP+INTJ+X", "who"]
["NP+INTJ+X", "profess"]
["CONJ", "and"]
["VERB", "call"]
["NP+PRON", "themselves"]
["NP+INTJ+X", "Christians"]
[".", ","]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "fixed"]
["NP+INTJ+X", "resolution"]
["X+PRT", "to"]
["NP+INTJ+X", "consider"]
["X+X", "a"]
["NP+INTJ+X", "decent"]
["NP+INTJ+X", "respect"]
["ADP", "for"]
["NP+INTJ+X", "Christianity"]
["ADP", "among"]
["X+DET", "the"]
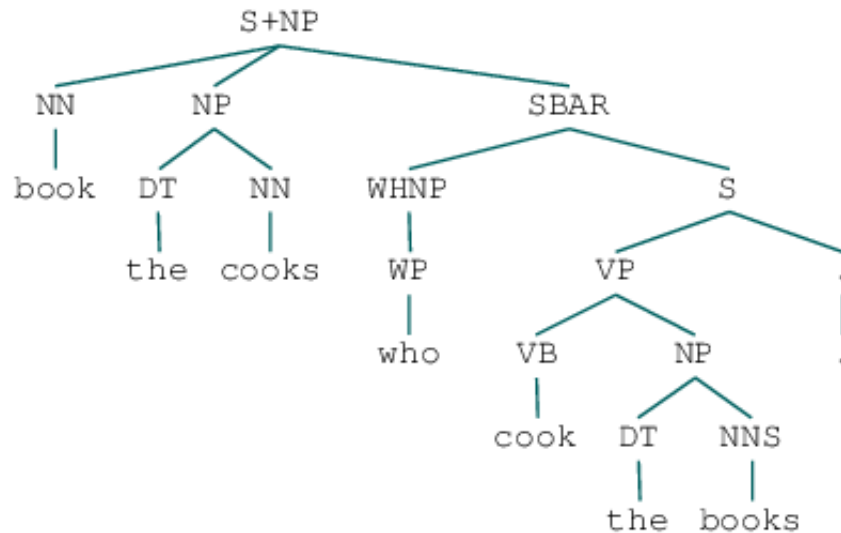["ADJP+ADJ", "best"]
["NP+INTJ+X", "recommendations"]
```

```
["ADP", "for"]
["X+DET", "the"]
["ADJP+ADJ", "public"]
["NP+NOUN", "service"]
[".", ","]
["VERB", "can"]
["NP+INTJ+X", "enable"]
["NP+PRON", "me"]
["ADP", "in"]
["NP+DET", "any"]
["NP+INTJ+X", "degree"]
["X+PRT", "to"]
["NP+INTJ+X", "comply"]
["ADP", "with"]
["PRON", "your"]
["NP+INTJ+X", "wishes"]
[".", ","]
["NP+PRON", "it"]
["NP+INTJ+X", "shall"]
["VERB", "be"]
["PRON", "my"]
["NP+INTJ+X", "strenuous"]
["NP+INTJ+X", "endeavor"]
["NP+ADP", "that"]
["NP+DET", "this"]
["NP+INTJ+X", "sagacious"]
["NP+INTJ+X", "injunction"]
["ADP", "of"]
["X+DET", "the"]
["NUM", "two"]
["NP+INTJ+X", "Houses"]
["NP+INTJ+X", "shall"]
["ADV", "not"]
["VERB", "be"]
["ADP", "without"]
["NP+NOUN", "effect"]
[".", "."]
None
```

2.3   Book the Cook who Cook the Books

```
[2]: parser.parse("Book the cooks who cook the books.")
```

[2]:

```
                         S+NP
         ┌─────────────┬──────────────┐
        NN            NP            SBAR
         │         ┌───┴───┐     ┌─────┴──────┐
       book       DT     NN    WHNP           S
                   │      │      │        ┌────┴────┐
                  the   cooks    WP       VP        .
                                 │     ┌──┴──┐      │
                                who   VB    NP      .
                                      │   ┌──┴──┐
                                     cook DT   NNS
                                          │     │
                                         the  books
```

3 Part 3

See BKL Ch8 Section 86. There is a probabilistic CKY parser (Links to an external site.). Apply it to "Book the cooks who cook the books." and the longest sentences from Assignment 2. Describe similarity and difference from previous results. A student has reported that there is something wrong with the code so if you cannot make it work within a reasonable time try to find and use some other statistical parse(s) you can find and if more than one compare results.

```python
[4]: from pcfg import pcfg_parser

     parser = pcfg_parser.PCFGParser() # initialize a PCFG parser
     parser.train("pcfg/counts_file.sample")
     parser.parse(word_tokenize("Book the cooks who cook the books."))
```

```
["NP+INTJ+X", "Book"]
["X+DET", "the"]
["NP+INTJ+X", "cooks"]
["NP+INTJ+X", "who"]
["NP+INTJ+X", "cook"]
["X+DET", "the"]
["NOUN", "books"]
[".", "."]
```

```python
[5]: parser.parse(max_sent_toke)
```

```
["ADP", "On"]
["NP+DET", "this"]
["ADJ", "subject"]
```

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```
["NP+PRON", "it"]
["VERB", "might"]
["VERB", "become"]
["NP+PRON", "me"]
["ADJP+ADV", "better"]
["X+PRT", "to"]
["VERB", "be"]
["NP+INTJ+X", "silent"]
["CONJ", "or"]
["X+PRT", "to"]
["NP+INTJ+X", "speak"]
["ADP", "with"]
["NP+INTJ+X", "diffidence"]
[".", ";"]
["CONJ", "but"]
["ADP", "as"]
["NP+NOUN", "something"]
["NP+VERB", "may"]
["VERB", "be"]
["VERB", "expected"]
[".", ","]
["X+DET", "the"]
["NP+INTJ+X", "occasion"]
[".", ","]
["NP+PRON", "I"]
["NP+INTJ+X", "hope"]
[".", ","]
["VERB", "will"]
["VERB", "be"]
["NP+INTJ+X", "admitted"]
["ADP", "as"]
["DET", "an"]
["NP+INTJ+X", "apology"]
["ADP", "if"]
["NP+PRON", "I"]
["NOUN", "venture"]
["X+PRT", "to"]
["NP+INTJ+X", "say"]
["NP+ADP", "that"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "preference"]
[".", ","]
["NP+INTJ+X", "upon"]
["NP+INTJ+X", "principle"]
[".", ","]
["ADP", "of"]
["X+X", "a"]
```

```
["NP+INTJ+X", "free"]
["NP+INTJ+X", "republican"]
["NOUN", "government"]
[".", ","]
["NP+INTJ+X", "formed"]
["NP+INTJ+X", "upon"]
["ADVP+ADJ", "long"]
["CONJ", "and"]
["ADJP+ADJ", "serious"]
["NP+INTJ+X", "reflection"]
[".", ","]
["ADP", "after"]
["X+X", "a"]
["NP+INTJ+X", "diligent"]
["CONJ", "and"]
["NP+INTJ+X", "impartial"]
["NP+INTJ+X", "inquiry"]
["ADP", "after"]
["NP+INTJ+X", "truth"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "attachment"]
["X+PRT", "to"]
["X+DET", "the"]
["NP+INTJ+X", "Constitution"]
["ADP", "of"]
["X+DET", "the"]
["NOUN", "United"]
["NP+INTJ+X", "States"]
[".", ","]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "conscientious"]
["NP+INTJ+X", "determination"]
["X+PRT", "to"]
["NP+NOUN", "support"]
["NP+PRON", "it"]
["ADP", "until"]
["NP+PRON", "it"]
["NP+INTJ+X", "shall"]
["VERB", "be"]
["NP+INTJ+X", "altered"]
["ADP", "by"]
["X+DET", "the"]
["NP+INTJ+X", "judgments"]
["CONJ", "and"]
["NP+INTJ+X", "wishes"]
```

```
["ADP", "of"]
["X+DET", "the"]
["NP+NOUN", "people"]
[".", ","]
["NP+INTJ+X", "expressed"]
["ADP", "in"]
["X+DET", "the"]
["NP+INTJ+X", "mode"]
["NP+INTJ+X", "prescribed"]
["ADP", "in"]
["NP+PRON", "it"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "respectful"]
["NP+INTJ+X", "attention"]
["X+PRT", "to"]
["X+DET", "the"]
["NP+INTJ+X", "constitutions"]
["ADP", "of"]
["X+DET", "the"]
["NP+INTJ+X", "individual"]
["NP+INTJ+X", "States"]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "constant"]
["NP+NOUN", "caution"]
["CONJ", "and"]
["NP+INTJ+X", "delicacy"]
["ADP", "toward"]
["X+DET", "the"]
["NP+INTJ+X", "State"]
["NP+INTJ+X", "governments"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["ADJ", "equal"]
["CONJ", "and"]
["NP+INTJ+X", "impartial"]
["NP+INTJ+X", "regard"]
["X+PRT", "to"]
["X+DET", "the"]
["NOUN", "rights"]
[".", ","]
["NP+NOUN", "interest"]
[".", ","]
["NP+INTJ+X", "honor"]
[".", ","]
```

```
["CONJ", "and"]
["NP+INTJ+X", "happiness"]
["ADP", "of"]
["ADVP+DET", "all"]
["X+DET", "the"]
["NP+INTJ+X", "States"]
["ADP", "in"]
["X+DET", "the"]
["NOUN", "Union"]
[".", ","]
["ADP", "without"]
["NP+INTJ+X", "preference"]
["CONJ", "or"]
["NP+INTJ+X", "regard"]
["X+PRT", "to"]
["X+X", "a"]
["NP+INTJ+X", "northern"]
["CONJ", "or"]
["NP+INTJ+X", "southern"]
[".", ","]
["DET", "an"]
["NP+INTJ+X", "eastern"]
["CONJ", "or"]
["NP+INTJ+X", "western"]
[".", ","]
["NOUN", "position"]
[".", ","]
["PRON", "their"]
["NP+INTJ+X", "various"]
["ADJ", "political"]
["NP+INTJ+X", "opinions"]
["ADVP+PRT", "on"]
["NP+INTJ+X", "unessential"]
["NOUN", "points"]
["CONJ", "or"]
["PRON", "their"]
["ADJ", "personal"]
["NP+INTJ+X", "attachments"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "love"]
["ADP", "of"]
["NP+INTJ+X", "virtuous"]
["NP+NOUN", "men"]
["ADP", "of"]
["ADVP+DET", "all"]
["NP+NOUN", "parties"]
```

```
["CONJ", "and"]
["NP+INTJ+X", "denominations"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "love"]
["ADP", "of"]
["NP+INTJ+X", "science"]
["CONJ", "and"]
["NP+INTJ+X", "letters"]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "wish"]
["X+PRT", "to"]
["NP+INTJ+X", "patronize"]
["DET", "every"]
["NP+INTJ+X", "rational"]
["NOUN", "effort"]
["X+PRT", "to"]
["NP+INTJ+X", "encourage"]
["NP+INTJ+X", "schools"]
[".", ","]
["NP+INTJ+X", "colleges"]
[".", ","]
["NP+INTJ+X", "universities"]
[".", ","]
["NP+INTJ+X", "academies"]
[".", ","]
["CONJ", "and"]
["DET", "every"]
["NP+INTJ+X", "institution"]
["ADP", "for"]
["NP+INTJ+X", "propagating"]
["NP+INTJ+X", "knowledge"]
[".", ","]
["NP+INTJ+X", "virtue"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "religion"]
["ADP", "among"]
["ADVP+DET", "all"]
["NP+INTJ+X", "classes"]
["ADP", "of"]
["X+DET", "the"]
["NP+NOUN", "people"]
[".", ","]
["ADV", "not"]
["ADV", "only"]
```

```
["ADP", "for"]
["PRON", "their"]
["NP+INTJ+X", "benign"]
["NP+INTJ+X", "influence"]
["ADVP+PRT", "on"]
["X+DET", "the"]
["NP+INTJ+X", "happiness"]
["ADP", "of"]
["NOUN", "life"]
["ADP", "in"]
["ADVP+DET", "all"]
["PRON", "its"]
["NP+INTJ+X", "stages"]
["CONJ", "and"]
["NP+INTJ+X", "classes"]
[".", ","]
["CONJ", "and"]
["ADP", "of"]
["NP+INTJ+X", "society"]
["ADP", "in"]
["ADVP+DET", "all"]
["PRON", "its"]
["NP+INTJ+X", "forms"]
[".", ","]
["CONJ", "but"]
["ADP", "as"]
["X+DET", "the"]
["ADV", "only"]
["VERB", "means"]
["ADP", "of"]
["NP+INTJ+X", "preserving"]
["PRON", "our"]
["NP+INTJ+X", "Constitution"]
["ADP", "from"]
["PRON", "its"]
["NP+INTJ+X", "natural"]
["NP+INTJ+X", "enemies"]
[".", ","]
["X+DET", "the"]
["NP+INTJ+X", "spirit"]
["ADP", "of"]
["NP+INTJ+X", "sophistry"]
[".", ","]
["X+DET", "the"]
["NP+INTJ+X", "spirit"]
["ADP", "of"]
["NP+INTJ+X", "party"]
[".", ","]
```

```
["X+DET", "the"]
["NP+INTJ+X", "spirit"]
["ADP", "of"]
["NP+INTJ+X", "intrigue"]
[".", ","]
["X+DET", "the"]
["NP+INTJ+X", "profligacy"]
["ADP", "of"]
["NP+INTJ+X", "corruption"]
[".", ","]
["CONJ", "and"]
["X+DET", "the"]
["NP+INTJ+X", "pestilence"]
["ADP", "of"]
["ADJ", "foreign"]
["NP+INTJ+X", "influence"]
[".", ","]
["NP+INTJ+X", "which"]
["VERB", "is"]
["X+DET", "the"]
["NP+INTJ+X", "angel"]
["ADP", "of"]
["NP+INTJ+X", "destruction"]
["X+PRT", "to"]
["NP+INTJ+X", "elective"]
["NP+INTJ+X", "governments"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "love"]
["ADP", "of"]
["ADJ", "equal"]
["NP+INTJ+X", "laws"]
[".", ","]
["ADP", "of"]
["NP+INTJ+X", "justice"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "humanity"]
["ADP", "in"]
["X+DET", "the"]
["NP+INTJ+X", "interior"]
["NOUN", "administration"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "inclination"]
["X+PRT", "to"]
```

```
["NP+INTJ+X", "improve"]
["NP+INTJ+X", "agriculture"]
[".", ","]
["NP+INTJ+X", "commerce"]
[".", ","]
["CONJ", "and"]
["NP+NOUN", "manufacturers"]
["ADP", "for"]
["NP+INTJ+X", "necessity"]
[".", ","]
["NP+INTJ+X", "convenience"]
[".", ","]
["CONJ", "and"]
["NOUN", "defense"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "spirit"]
["ADP", "of"]
["NOUN", "equity"]
["CONJ", "and"]
["NP+INTJ+X", "humanity"]
["ADP", "toward"]
["X+DET", "the"]
["NP+INTJ+X", "aboriginal"]
["NP+INTJ+X", "nations"]
["ADP", "of"]
["NP+NOUN", "America"]
[".", ","]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "disposition"]
["X+PRT", "to"]
["NP+INTJ+X", "meliorate"]
["PRON", "their"]
["NP+INTJ+X", "condition"]
["ADP", "by"]
["NP+INTJ+X", "inclining"]
["NP+PRON", "them"]
["X+PRT", "to"]
["VERB", "be"]
["NP+ADJ", "more"]
["NP+INTJ+X", "friendly"]
["X+PRT", "to"]
["NP+PRON", "us"]
[".", ","]
["CONJ", "and"]
["PRON", "our"]
```

```
["NP+INTJ+X", "citizens"]
["X+PRT", "to"]
["VERB", "be"]
["NP+ADJ", "more"]
["NP+INTJ+X", "friendly"]
["X+PRT", "to"]
["NP+PRON", "them"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "inflexible"]
["NP+INTJ+X", "determination"]
["X+PRT", "to"]
["NP+INTJ+X", "maintain"]
["NP+INTJ+X", "peace"]
["CONJ", "and"]
["NP+INTJ+X", "inviolable"]
["NP+INTJ+X", "faith"]
["ADP", "with"]
["ADVP+DET", "all"]
["NP+INTJ+X", "nations"]
[".", ","]
["CONJ", "and"]
["NP+ADP", "that"]
["NOUN", "system"]
["ADP", "of"]
["NP+INTJ+X", "neutrality"]
["CONJ", "and"]
["NP+INTJ+X", "impartiality"]
["ADP", "among"]
["X+DET", "the"]
["NP+INTJ+X", "belligerent"]
["NP+INTJ+X", "powers"]
["ADP", "of"]
["NP+NOUN", "Europe"]
["NP+INTJ+X", "which"]
["VERB", "has"]
["VERB", "been"]
["NP+INTJ+X", "adopted"]
["ADP", "by"]
["NP+DET", "this"]
["NP+INTJ+X", "Government"]
["CONJ", "and"]
["ADJP+ADV", "so"]
["NP+INTJ+X", "solemnly"]
["NP+INTJ+X", "sanctioned"]
["ADP", "by"]
["NP+DET", "both"]
```

```
["NP+INTJ+X", "Houses"]
["ADP", "of"]
["NP+NOUN", "Congress"]
["CONJ", "and"]
["NP+INTJ+X", "applauded"]
["ADP", "by"]
["X+DET", "the"]
["NP+INTJ+X", "legislatures"]
["ADP", "of"]
["X+DET", "the"]
["NP+INTJ+X", "States"]
["CONJ", "and"]
["X+DET", "the"]
["ADJP+ADJ", "public"]
["NP+INTJ+X", "opinion"]
[".", ","]
["ADP", "until"]
["NP+PRON", "it"]
["NP+INTJ+X", "shall"]
["VERB", "be"]
["NP+INTJ+X", "otherwise"]
["NP+INTJ+X", "ordained"]
["ADP", "by"]
["NP+NOUN", "Congress"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["ADJ", "personal"]
["NP+INTJ+X", "esteem"]
["ADP", "for"]
["X+DET", "the"]
["ADJ", "French"]
["NOUN", "nation"]
[".", ","]
["NP+INTJ+X", "formed"]
["ADP", "in"]
["X+X", "a"]
["NP+INTJ+X", "residence"]
["ADP", "of"]
["NUM", "seven"]
["NOUN", "years"]
["NP+INTJ+X", "chiefly"]
["ADP", "among"]
["NP+PRON", "them"]
[".", ","]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "sincere"]
```

```
["NP+INTJ+X", "desire"]
["X+PRT", "to"]
["NP+INTJ+X", "preserve"]
["X+DET", "the"]
["NP+INTJ+X", "friendship"]
["NP+INTJ+X", "which"]
["VERB", "has"]
["VERB", "been"]
["ADJP+ADV", "so"]
["NP+ADJ", "much"]
["ADP", "for"]
["X+DET", "the"]
["NP+INTJ+X", "honor"]
["CONJ", "and"]
["NP+NOUN", "interest"]
["ADP", "of"]
["NP+DET", "both"]
["NP+INTJ+X", "nations"]
[".", ";"]
["ADP", "if"]
[".", ","]
["ADP", "while"]
["X+DET", "the"]
["NP+INTJ+X", "conscious"]
["NP+INTJ+X", "honor"]
["CONJ", "and"]
["NP+INTJ+X", "integrity"]
["ADP", "of"]
["X+DET", "the"]
["NP+NOUN", "people"]
["ADP", "of"]
["NP+NOUN", "America"]
["CONJ", "and"]
["X+DET", "the"]
["NP+INTJ+X", "internal"]
["NP+INTJ+X", "sentiment"]
["ADP", "of"]
["PRON", "their"]
["ADJ", "own"]
["NOUN", "power"]
["CONJ", "and"]
["NP+INTJ+X", "energies"]
["VERB", "must"]
["VERB", "be"]
["NP+INTJ+X", "preserved"]
[".", ","]
["DET", "an"]
["NP+INTJ+X", "earnest"]
```

```
["NP+INTJ+X", "endeavor"]
["X+PRT", "to"]
["NP+INTJ+X", "investigate"]
["DET", "every"]
["ADVP+ADV", "just"]
["VERB", "cause"]
["CONJ", "and"]
["NP+INTJ+X", "remove"]
["DET", "every"]
["NP+INTJ+X", "colorable"]
["NP+INTJ+X", "pretense"]
["ADP", "of"]
["NP+INTJ+X", "complaint"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "intention"]
["X+PRT", "to"]
["NP+INTJ+X", "pursue"]
["ADP", "by"]
["NP+INTJ+X", "amicable"]
["NP+INTJ+X", "negotiation"]
["X+X", "a"]
["NP+INTJ+X", "reparation"]
["ADP", "for"]
["X+DET", "the"]
["NP+INTJ+X", "injuries"]
["NP+ADP", "that"]
["VERB", "have"]
["VERB", "been"]
["NP+INTJ+X", "committed"]
["ADVP+PRT", "on"]
["X+DET", "the"]
["NP+INTJ+X", "commerce"]
["ADP", "of"]
["PRON", "our"]
["NP+INTJ+X", "fellow-citizens"]
["ADP", "by"]
["NP+INTJ+X", "whatever"]
["NOUN", "nation"]
[".", ","]
["CONJ", "and"]
["ADP", "if"]
["NP+NOUN", "success"]
["VERB", "can"]
["ADV", "not"]
["VERB", "be"]
["NP+INTJ+X", "obtained"]
```

```
[".", ","]
["X+PRT", "to"]
["NP+INTJ+X", "lay"]
["X+DET", "the"]
["NP+INTJ+X", "facts"]
["ADVP+ADP", "before"]
["X+DET", "the"]
["NP+INTJ+X", "Legislature"]
[".", ","]
["NP+ADP", "that"]
["NP+PRON", "they"]
["NP+VERB", "may"]
["NP+INTJ+X", "consider"]
["NP+INTJ+X", "what"]
["ADVP+ADV", "further"]
["NP+INTJ+X", "measures"]
["X+DET", "the"]
["NP+INTJ+X", "honor"]
["CONJ", "and"]
["NP+NOUN", "interest"]
["ADP", "of"]
["X+DET", "the"]
["NP+INTJ+X", "Government"]
["CONJ", "and"]
["PRON", "its"]
["NP+INTJ+X", "constituents"]
["NP+VERB", "demand"]
[".", ";"]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "resolution"]
["X+PRT", "to"]
["VERB", "do"]
["NP+INTJ+X", "justice"]
["ADP", "as"]
["ADV", "far"]
["ADP", "as"]
["NP+VERB", "may"]
["NP+INTJ+X", "depend"]
["NP+INTJ+X", "upon"]
["NP+PRON", "me"]
[".", ","]
["X+ADP", "at"]
["ADVP+DET", "all"]
["CONJ", "times"]
["CONJ", "and"]
["X+PRT", "to"]
["ADVP+DET", "all"]
```

```
["NP+INTJ+X", "nations"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "maintain"]
["NP+INTJ+X", "peace"]
[".", ","]
["NP+INTJ+X", "friendship"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "benevolence"]
["ADP", "with"]
["ADVP+DET", "all"]
["X+DET", "the"]
["NOUN", "world"]
[".", ";"]
["ADP", "if"]
["DET", "an"]
["NP+INTJ+X", "unshaken"]
["NP+INTJ+X", "confidence"]
["ADP", "in"]
["X+DET", "the"]
["NP+INTJ+X", "honor"]
[".", ","]
["NP+INTJ+X", "spirit"]
[".", ","]
["CONJ", "and"]
["NP+INTJ+X", "resources"]
["ADP", "of"]
["X+DET", "the"]
["ADJ", "American"]
["NP+NOUN", "people"]
[".", ","]
["ADVP+PRT", "on"]
["NP+INTJ+X", "which"]
["NP+PRON", "I"]
["VERB", "have"]
["ADJP+ADV", "so"]
["ADVP+ADV", "often"]
["NP+INTJ+X", "hazarded"]
["PRON", "my"]
["ADVP+DET", "all"]
["CONJ", "and"]
["ADVP+ADV", "never"]
["VERB", "been"]
["NP+INTJ+X", "deceived"]
[".", ";"]
["ADP", "if"]
["NP+INTJ+X", "elevated"]
```

```
["NP+INTJ+X", "ideas"]
["ADP", "of"]
["X+DET", "the"]
["ADJP+ADV", "high"]
["NP+INTJ+X", "destinies"]
["ADP", "of"]
["NP+DET", "this"]
["NP+NOUN", "country"]
["CONJ", "and"]
["ADP", "of"]
["PRON", "my"]
["ADJ", "own"]
["NP+INTJ+X", "duties"]
["ADP", "toward"]
["NP+PRON", "it"]
[".", ","]
["NP+INTJ+X", "founded"]
["ADVP+PRT", "on"]
["X+X", "a"]
["NP+INTJ+X", "knowledge"]
["ADP", "of"]
["X+DET", "the"]
["NP+INTJ+X", "moral"]
["NP+INTJ+X", "principles"]
["CONJ", "and"]
["NP+INTJ+X", "intellectual"]
["NP+INTJ+X", "improvements"]
["ADP", "of"]
["X+DET", "the"]
["NP+NOUN", "people"]
["NP+INTJ+X", "deeply"]
["NP+INTJ+X", "engraven"]
["ADVP+PRT", "on"]
["PRON", "my"]
["NP+INTJ+X", "mind"]
["ADP", "in"]
["ADJ", "early"]
["NOUN", "life"]
[".", ","]
["CONJ", "and"]
["ADV", "not"]
["NP+INTJ+X", "obscured"]
["CONJ", "but"]
["NP+INTJ+X", "exalted"]
["ADP", "by"]
["NP+NOUN", "experience"]
["CONJ", "and"]
["NP+NOUN", "age"]
```

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```
[".", ";"]
["CONJ", "and"]
[".", ","]
["ADP", "with"]
["NP+INTJ+X", "humble"]
["NP+INTJ+X", "reverence"]
[".", ","]
["NP+PRON", "I"]
["VERB", "feel"]
["NP+PRON", "it"]
["X+PRT", "to"]
["VERB", "be"]
["PRON", "my"]
["NP+INTJ+X", "duty"]
["X+PRT", "to"]
["NP+INTJ+X", "add"]
[".", ","]
["ADP", "if"]
["X+X", "a"]
["NP+INTJ+X", "veneration"]
["ADP", "for"]
["X+DET", "the"]
["NP+INTJ+X", "religion"]
["ADP", "of"]
["X+X", "a"]
["NP+NOUN", "people"]
["NP+INTJ+X", "who"]
["NP+INTJ+X", "profess"]
["CONJ", "and"]
["VERB", "call"]
["NP+PRON", "themselves"]
["NP+INTJ+X", "Christians"]
[".", ","]
["CONJ", "and"]
["X+X", "a"]
["NP+INTJ+X", "fixed"]
["NP+INTJ+X", "resolution"]
["X+PRT", "to"]
["NP+INTJ+X", "consider"]
["X+X", "a"]
["NP+INTJ+X", "decent"]
["NP+INTJ+X", "respect"]
["ADP", "for"]
["NP+INTJ+X", "Christianity"]
["ADP", "among"]
["X+DET", "the"]
["ADJP+ADJ", "best"]
["NP+INTJ+X", "recommendations"]
```

```
["ADP", "for"]
["X+DET", "the"]
["ADJP+ADJ", "public"]
["NP+NOUN", "service"]
[".", ","]
["VERB", "can"]
["NP+INTJ+X", "enable"]
["NP+PRON", "me"]
["ADP", "in"]
["NP+DET", "any"]
["NP+INTJ+X", "degree"]
["X+PRT", "to"]
["NP+INTJ+X", "comply"]
["ADP", "with"]
["PRON", "your"]
["NP+INTJ+X", "wishes"]
[".", ","]
["NP+PRON", "it"]
["NP+INTJ+X", "shall"]
["VERB", "be"]
["PRON", "my"]
["NP+INTJ+X", "strenuous"]
["NP+INTJ+X", "endeavor"]
["NP+ADP", "that"]
["NP+DET", "this"]
["NP+INTJ+X", "sagacious"]
["NP+INTJ+X", "injunction"]
["ADP", "of"]
["X+DET", "the"]
["NUM", "two"]
["NP+INTJ+X", "Houses"]
["NP+INTJ+X", "shall"]
["ADV", "not"]
["VERB", "be"]
["ADP", "without"]
["NP+NOUN", "effect"]
[".", "."]
```