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LING 492B: Computational Linguistics
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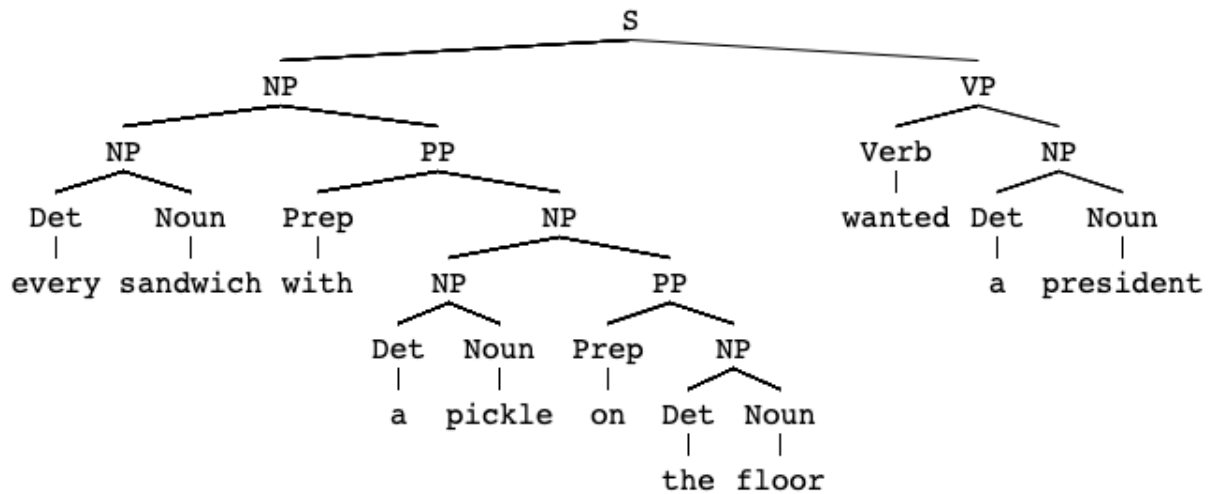
Lab 5 Questions

Part One:

1. The sentences are long because of the addition of so many prepositional phrases. The grammar rule that causes long sentences to be generated is the NP -> NP PP rule. Because this rule can keep being called within itself (i.e. it is an NP inside of an NP), it allows for recursion of prepositional phrases, making the sentences very long. This grammar is also set up so that VP -> Verb NP and PP -> Prep NP, so the NP rule above can be used in verb phrases as well as prepositional phrases.
2. The reason why multiple adjectives are used so rarely is because there are six possible 'nouns' and Noun -> Adj Noun is 1/6 chance of being generated. So, the probability of generating multiple adjectives is low.
3. To fix the problem in 1, the probability of the NP -> NP PP rule needs to be modified so that it happens less often and long sentences are less likely to be generates. I made it so that the count of the other NP rule is 3 so it's higher than the NP PP rule so it's less likely to generate a loop of preposition phrases. For the problem in 2, the probability of the noun rule can be modified to be even higher. I set the count to 4, which increased the number of double adjectives generated.
4. I couldn't really pinpoint anything particularly unnatural about the sentences that could be fixed by making any numerical alterations. The only things that are unnatural about the sentences are semantic issues, which is to be expected with random sentence generation.

Part 2 Sentences:

1. that Sally sighed perplexed a delicious pickle .
2. a sandwich sighed !
3. is it true that Sally and a fine pickled pickle under a pickle worked on every perplexed pickle ?
4. a pickled chief of staff ate every chief of staff and sighed and ate the pickle .
5. that the delicious pickled very perplexed sandwich and a pickled president and Sally sighed perplexed Sally and every sandwich and the pickled president on a fine sandwich .
6. the sandwich and a very delicious fine floor pickled Sally !
7. a very very delicious floor with a president understood the very very delicious floor .
8. a very very very very very delicious perplexed pickled president understood that the pickled pickle pickled every perplexed delicious pickle .
9. Sally with every sandwich thought that every pickle worked on Sally .
10. the perplexed very delicious sandwich thought that the delicious sandwich wanted Sally .

Part Four:

5. Alternate tree: [S [NP [NP [Det every] [Noun sandwich]] [PP [Prep with] [NP [NP [Det a] [Noun pickle]] [PP [Prep on] [NP [Det the] [Noun floor]]]]]] [VP [Verb wanted] [NP [Det a] [Noun president]]]]

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                                    S
            _____|_____
           NP                                                VP
      _____|_____                                      ___|___
     NP            PP                                   Verb     NP
   __|__       ____|_____                             |     __|___
  Det   Noun  Prep         NP                          wanted Det   Noun
   |     |     |      _____|_____                           |      |
 every sandwich with  NP          PP                          a   president
                    __|__      ___|___
                   Det  Noun  Prep    NP
                    |    |     |     __|__
                    a  pickle  on  Det  Noun
                                    |     |
                                   the  floor
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6. The ambiguity of this sentence comes from the attachment of the PP 'on the floor'. This means that the sentence can either mean that the sandwich is on the floor (given tree meaning) or the pickle is on the floor (alternate meaning).