**NLP – Assignment 2**

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**Part 1**

1. The grammar rule responsible for the long sentences is rule NP -> NP PP. what is special about this rule is that it allows for recursive calls to NP and the fact that NP has only 2 possible derivations, which means that a recursive call will happen with a 50% chance, thus allowing for long sentences with preposition descriptors.
2. The reason behind this is that Noun has a total of 6 possible derivations, 5 of which are terminals. This means that a noun with an adjective will be selected with 1/6 probability and double adjective is 1/6\*1/6.
3. In order to solve the problem with (a) we have given more weight to the NP -> Det Noun, which causes the sentences to be shorter and more natural. To deal with (b) we have given more weight to the rule Noun -> Adj Noun. All of the changes can be seen in grammer1
4. In addition to the changes described in ( c ) we have committed the following weight changes:
   1. Give more weight to president, chief of staff and sandwich over floor and pickle because they can work together better
   2. Give more weight to wanted verb which works well with almost any other noun, also give less weight to pickled which works basically only with pickled
   3. Give more weight to adjectives with double meaning ( delicious, fine can be said on both the president and a sandwich e.g.)
   4. Give more weight to the with preposition which is more common on the English language
   5. Prefer "the" and "a" over "every"

**Part 2**

I will now briefly discuss the additions \ changes made for each sentence:

1. Added a new pre-terminal Name, added NP Name ( because a name has no determiner)
2. Added new state to allow choosing 2 NP's and then 2 Verbs connected with 'and'. This made me add rule S ( later changed to NS ) -> DNP DVP ( Double NP, Double VP)
3. Added new kind of verbs which does not require NP
4. For d and e I needed to split S so I turned what was up until then S into NS ( Normal Sentence) and allow S to derive NS, NP thought that NS and it perplexed NP that NS.
5. See (d)
6. Allow Adj to derive very Adj
7. Added new PVP state (Propositional Verb Phrase) which allow for PropositionalVerb NP.
8. Added To NS new rule NS -> NP AP (Adjective Phrase)
9. Added NS -> NP PRG (Progressive Phase)
10. Added new TP ( Thought Phrase) which comes with thought that. Only on that state allow for NP is NP sentence…

**Part 4**

This grammar handles the b, g phenomena  
For b phenomena it uses QS (question sentence) of different types according  
To the question word that the sentence begin with, Each type of QS allow   
Different states.  
For g phenomena it allows another two states TSA and OSA, TSA means, Appos , and OSA means , Appos (TSA is used in the middle of the sentence while   
OSA is used in the end), then it allows to go to TSA/OSA (accoording to the location in he sentence)  
after a noun is seen so it (the Appos) can describe it.