NLP Assignment 2

David Samuelson, 208788851

# Part 1:

1. The program generates so many long sentences because of the following recursive rule:

NP -> NP PP

This rule expands NP way too many times.  
Again, this rule is special because its recursive, and there is no weight limit (yet)

1. The grammar does not generate too much multiple adjectives, because in order to generate multiple adjectives it needs to overcome the sum of weights of all the other nouns: The rule that creates adjectives before noun is :  
   Noun -> Adj Noun  
   There are 6 different options to noun (including this one), and currently all the weights are 1, so the probability that a noun will expand to Adj and Noun is . The probability that it will expand again is , and so on…
2. Shorter sentences – increase the weight of the non-recursive rules that usually make the sentence so long. This just lowers the probability of each expansion from 50% to around 20-25%, which makes the sentences shorter.  
   More multiple adjectives – just increase the weight of the rule "Noun -> Adj Noun", which will give it more probability to expand. I raised it to 6, so it would be 50%.

# Part 2:

1. This option was supported earlier, its essentially "VP -> Verb NP".  
   Just added few more words to the vocab.
2. To support that, I added rule to NP and to VPS – "VPS -> VP Conj VP" and "NP -> NN Conj NN", to enable multiple verbs and subjects, with Conj in between.
3. Added verb form – VerbPastTerminal, to support verbs that can finish a sentence.  
   sighed, ate, understood, etc… then added a rule – VP -> VerbPastTerminal
4. Added complementary rule – SBAR ("SBAR that S"), and then added a rule – "VP -> VerbPastComp SBAR", which enables things like "thought that…". It is commented in the grammar.
5. Added a rule – VerbPastFeel, which is a verb in past form that describes how a person feels about something (how it made him feel), verbs like pleased.  
   then added a rule – "S -> it VerbPastFeel NP SBAR"
6. it was supported before, it’s the rule "Noun -> JJ Noun". Added very to the vocab.
7. Added "worked" to the VerbPastTerminal , and added desk to nouns. It automatically supported the option.
8. Added the rule "S -> NP JJ" to support that
9. Added new verb form, to support "eating"
10. Very close to (d)

In short – added few more verb forms, and some sentence structure. Its all commented in the grammar.

# Part 4:

I added Yes/No questions and vowel determines.

a/an – just separated the nouns, and the determines.  
added the rules

2 NN Det Noun  
2 NN DetVowel VoNoun # an apple

Which solved it. But to overcome \*"an tasty apple" – added this rule.  
3 Noun JJ VoNoun # a fine apple

Meaning – allowed it to be derived only from a Noun.

Second option – just added a new verb form – verbPresentTerm, and added auxiliaries, for the questions, and added those rules:  
1 YNQ Aux NP YNQVP

1 YNQVP VerbPresentTerm

1 YNQVP VerbPresentTerm Prep NP  
  
which create a basic yes/no questions.

# Part 5:

I didn’t do it, as I understood it’s a bonus. Unfortunately, I don’t have enough time for the bonus, but it was a very interesting assignment anyways.