Grammar for English

S -> DP VP
DP -> D NP │ Pro
NP -> (AP) N (PP)
AP -> (AP) A
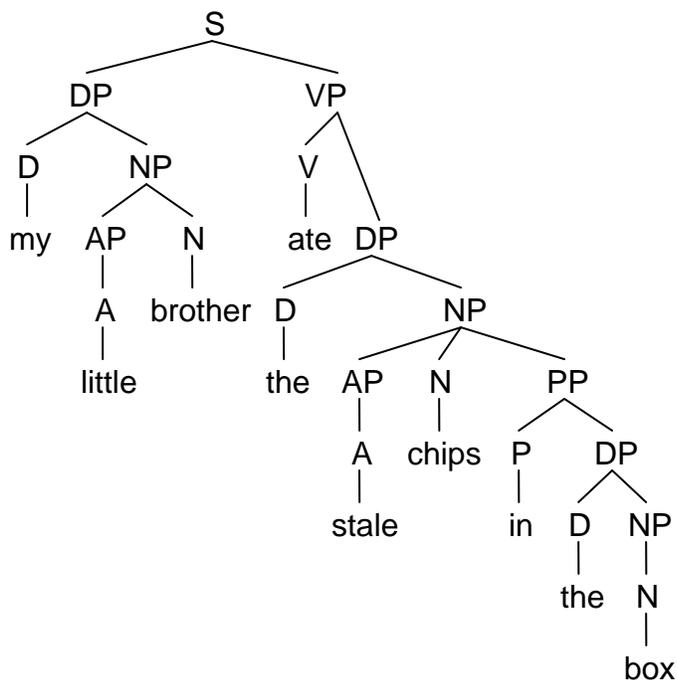VP_t -> (Adv) V_t DP (PP) (Adv)
VP_i -> (Adv) V_i (PP) (Adv)
PP -> P DP
X -> X and X

Tree using the above grammar

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                    S
          ┌─────────┴─────────┐
         DP                   VP
      ┌───┴───┐            ┌───┴───┐
      D       NP           V       
      │    ┌──┴──┐         │    ┌───┴
     my   AP     N        ate  DP
          │      │            ┌─┴──────────┐
          A    brother        D            NP
          │                   │       ┌─────┼──────┐
        little               the     AP     N      PP
                                     │      │    ┌──┴──┐
                                     A    chips  P     DP
                                     │           │   ┌─┴─┐
                                   stale         in  D   NP
                                                     │    │
                                                    the   N
                                                          │
                                                         box
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My little brother ate the stale chips in the box.

Explanation of rules/how to draw trees

Here is a translation of the above grammar rules:

S -> DP VP
A sentence is composed of a determiner phrase (DP) and a verb phrase (VP)

DP -> D NP (line) Pro

A determiner phrase is composed of a determiner and a noun phrase (NP) OR (the line means or) a pronoun

NP -> (AP) N (PP)

A noun phrase is composed of an optional adjective phrase (AP) (the parentehsis in a rule means that it is optional), a noun N and an optional prepositions phrase (PP)

AP -> (AP) A

An adjective phrase is composed of an optional AP and an adjective

VP_t -> (Adv) V_t DP (PP) (Adv)

A transitive verb phrase is composed of an optional adverb (adv), a transitive verb (V_t), a DP, an optional PP, followed by an optional Adv

VP_i -> (Adv) V_i (PP) (Adv)

A intransitive verb phrase is composed of an optional adverb (adv), a intransitive verb (V_i), an optional PP, followed by an optional Adv

PP -> P DP

A PP is composed of a preposition and a DP

X -> X and X

For coordination, any category X (NP, DP, VP, N, A, etc.) can be formed of the same category X followed by "and" (likewise "or" or "but) and then an element of the same category X.

OK, so this grammar can form English sentences, and remember that the linear order in these rules is important.

So to draw a tree for a sentence, I will be referring to the tree in the same file as the grammar "my little brother ate the stale chips in the box."

We know that the sentence will consist of a DP and a VP because that's what out rules tell us. If we try and divide these up, we see that we have the DP "my little brother" and the VP "ate the stale chips in the box." How do we know this? Our rules tell us that the first thing the VP will either be an Adv or a verb. Because linear order is important in these grammar rules, we know that everything that follows either an Adv or a V will be part of the verb phrase. Since there's no adverb, we can look at the verb and conclude that everything following it is part of the verb phrase.

Now we need to draw our DP. Our rules tell us that a DP consists of a determiner followed by an NP. We find the determiner, "my" and conclude that everything that follows it must be part of the NP. So now we know that "little brother" is part of the NP. So an NP can consist of an

optional AP, followed by a N, followed by a PP. In "little brother," we only have an adjective and a noun. So we conclude that little is an AP, going to an A, and that N is the noun.

Ok- on to the VP. We have already determined that there is no adverb in the VP. We know that a transitive VP can consist of a V_t, followed by a DP followed by an optional PP, followed by an optional Adv. Again there are no adverbs in this sentence so what concerns us is how to draw the DP and PP. We need to decide if the PP is modifiying the whole VP, in which case it should be drawn with a line connecting it to the VP, or if it's modifying on the NP, in which case it should be connected with the NP.

In order to determine this, we can think about the meaning. If it's connected to the VP, then the meaning would be translated as "my little brother ate the stale chips while he was in the box- the eating was done in the box." The NP meaning is "my little brother ate the chips which were in the box." Here we are going to draw the latter structure.

So our VP will consist of a V and a DP. We follow the same rules to construct our DP as we did when we were drawing our subject, only here our NP has a PP. Since our rule says that an NP can be composed of an AP, N and PP, our NP here has three lines going away from it.

To draw our PP, we look to our rules which state that a PP is composed of a P and a DP, so we draw the P and the DP, following the same process above in order to complete our DP.

So now we have drawn our tree and we are finished!!!

Hooray!!!!!!