SLP Exercise 3b October 22, 2020

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**Grammars and Parsing**

Draw parse trees for the following, using the grammar in Chapter 12 of J&M.

the earliest flight

Diagram

Description automatically generated

An ambiguity we found is that we consider earliest flight to be the noun of the noun phrase because other wise it will be impossible to semantically parse the phrase. The problem is that earliest is an adjective not a piece of a noun. Furthermore, we leave the Verb Phrase empty and hence the parson fails. Based on this we suggest there are the rules Noun Phrase to Determinant Noun Phrase and as well Noun Phrase to Adjective to Noun. We decided to go with this parsin because “the” was a determinant, and we just assume the noun was “earliest flight”.

oakland to salt lake city

Diagram

Description automatically generated

For this parsing we found the ambiguity to be once again the verb phrase, we could find a more-or-less suitable rule to match the noun phrase with the big assumption that to is a coordinate conjunction which it isn’t. We decided to go with this parsing because Oakland and Salt Lake City are nouns. From this example we realized about the need for a sentence to be only a Noun Phrase or a Verb Phrase to be able to be mapped to a “None”.

i want to leave before noon

Diagram

Description automatically generated

For this example we decided to parse it this way because we found how good the match with the current rules was for “I” (a presposition), “want” a verb in present tense, and “To” which is a class for itself. There is the ambiguity of leave being a past tense verb, which is obviously not true, but we decided to disambiguiate this way to match “IN” with before. We also notice a second issue arise by classifying noon as a preposition which clearly it is not. From this example we suggest the rules VP -> VBP PP and PRP -> NN.

show american flights after twelve p.m. from miami to chicago

Text

Description automatically generated

For this example we decided to start by choosing the first derivation of NP as “None” because the sentence starts with the verb “show”, we continued the semantic parsing through derivations, nevertheless we fail after we choose the derivation of the verb phrase as a verb and an adjective phrase. The derivation fails as we can see because the Noun Phrase, should derivate to an adjective first but no rule does exist, hence “after” does not receive a part of speech that is even close to what it really is, hence we don’t further disambiguate. From this example we found that it will be helpful to have the rules ADJP -> ADJ NP and NP -> NN PP.

what is the cheapest one way flight from phoenix to san diego that arrives in the morning on thursday june second

Diagram

Description automatically generated

For this example we started by developing the sentence treating “what is” as a verb, which is a stretch but not too much. This allows to disambiguate the next elements of the sentence as what they are a determinant, an adjective, another adjective, and finally a noun which is the flight. We decided to use such derivation because the only thing that fails is a “,” comma. Other than that, every element falls in place. We then disambiguate the word from as a verb which is not too “bad” and with this we can further disambiguate the phrase “Phoenix to San Diego” is correctly disambiguated but for “to” as a coordinate conjunction. Then on the right side we further disambiguate a Verb Phrase as a verb and another sentence. The verb is not existent, which is weird, but this allow to disambiguate into another sentence which has a Noun Phrase and a Verb Phrase, the Noun Phrase then disambiguates into a Determinant “The” and the NN is missing. On the other side of this sentence we have a Verb Phrase that disambiguates into a Verb in the past tense which we decide to disambiguate as such because it allows to create a Prepositional Phrase disambiguation. By ending with a Prepositional Phrase disambiguation we can create the IN disambiguation which would have “in” and then a Noun Phrase will allow to use a rule to properly determine “the” as a determinant, “morning” as an adjective, “on” as an adjective even though it is not, but it allows to treat “Thursday June Second” as a Noun, which lightly analyzed it is.

Note any ambiguity. State why you chose to parse it the way you did.

Note a case where the rules of J&M’s grammar are inadequate. Give a rule to augment the grammar to handle this.

In the case of the sentence “Me, Him, and them are in a team.” Is a sentence that could not be semantically parsed because there is not a rule that allows to have a NP -> Noun,NP and NP-> Noun.

Work in pairs or individually.