Tutorial 3: Parsing

Status: Completed
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Submission deadline: 30 Aug 2019 23:55, 45 days left

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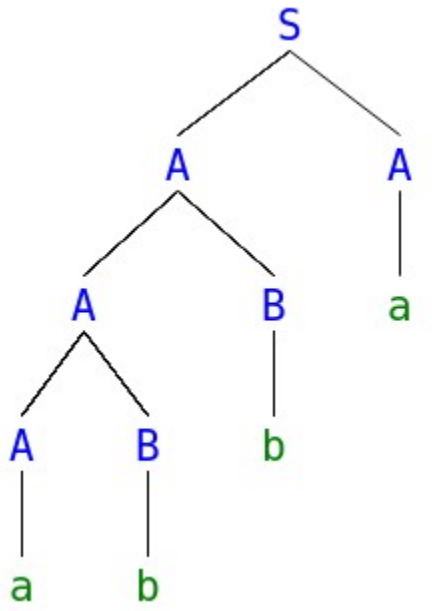
Part I: Constituent parsing

Q1. Context-free grammar

Consider this constituent tree:



Q1a - Write down the context-free grammar that results in this tree.

Q1b - Adding the rules A -> *BB* and A -> AA makes the sentence structurally ambiguous. Draw the tree for the other interpretation.

Q2. CKY

Here is a simple context-free grammar for a fragment of English:

```
S -> NP VP
NP -> Det N
NP -> NP PP
PP -> P NP
VP -> V NP
VP -> V PP
VP -> VP PP
Det -> "a"
N -> "present" | "garden" | "tree"
NP -> "Lydia" | "George"
V -> "gives" | "walks"
P -> "to" | "in" | "with"
```

Q2a - Complete the CKY tables for the following two sentences.

1. George gives a present to Lydia
2. Lydia walks in a garden with a tree

Q2b - Sentence 2 is ambiguous. For each interpretation, give the constituent tree and an intuitive rephrasing that makes the difference clear (like they do in this blog post). [**Note:** Sentence 1 is actually ambiguous too. You only need to give two interpretations for sentence 2 though]

Part II: Dependency parsing

Q3. CONNL-U

Consider these two dependency parses for the same sentence.

```
1    The      the      DET     _    _    2    det
2    panda    panda    NOUN    _    _    3    nsbj
3    eats     eat      VERB    _    _    0    root
4    shoots   shoot    NOUN    _    _    3    dobj
5    and      and      CONJ    _    _    4    cc
6    leaves   leaf     NOUN    _    _    4    conj

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3    eats     eat      VERB    _    _    0    root
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5    and      and      CONJ    _    _    3    cc
6    leaves   leave    VERB    _    _    3    conj
```

Universal dependencies references:

- CONLL-U format
- Dependency tags
- PoS tags

Q3a - Which of the two parses does the Stanford CoreNLP parser get (use the *Basic Dependencies)*? Draw the other tree. [**Note:** Actually the CoreNLP parser doesnt exactly match either -- but just choose one to draw or draw both if you like]

Q3b - Like Q2b, rephrase the sentence twice to highlight the difference in meaning implied by the two parses. For each one, explain why the dependency parse implies that interpretation. *Hint: If you're not sure what the difference is, look at the lemmas and PoS tags to get a clue (but be sure to refer to the parse in your explanation).*

Q4. Transition-based parsing

Q4a - Choose one of the two trees from Q3a and fill out the transition table for it. E.g., Lecture 7 slides, p.29; JMv3 p.285.

Note: There are slight differences between the slides and JM (Word list = Buffer, Action = Transition, Relation Added = Graph). Also, the slides do not explicitly do the *REDUCE* action. You can do it either way.

Q4b - What's the first step in the table that would be different if you chose the other parse tree? Give just that one line of the alternative transition table.

Hemanth Kumar Battula , 14 Dec 2018 19:52

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Status set to: To be marked

Bill Noble , 27 Dec 2018 21:31

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Mark set to: 7

Grade set to: G

Comment: Q1a - good.
Q1b - here ""another interpretation"" means the same terminal nodes (""a b b a"") with different tree that results in them.

Q2 - good.

Q3 - good.

Q4 - Good!