

Natural Language Processing - Ex4

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2 Transition-based Parsing

Q1

1. $likes \rightarrow_{nsubj} John$
2. $like \rightarrow_{obj} balloons$
3. $balloons \rightarrow_{conj} eggs$
4. $balloons \rightarrow_{acl} pop$
5. $pop \rightarrow_{mark} that$
6. $eggs \rightarrow_{cc} and$

Here is a sequence of transitions that yields the above tree:

Start:

$stack = [root], buffer = ['John', 'likes', 'balloons', 'that', 'pop', 'and', 'eggs']$

Shift: $\times 2$

$stack = [root, 'John', 'likes'], buffer = ['balloons', 'that', 'pop', 'and', 'eggs']$

Left_arc_{nsubj}: (1) :

$stack = [root, 'likes'], buffer = ['balloons', 'that', 'pop', 'and', 'eggs']$

Shift: $\times 3$

$stack = [root, 'likes', 'balloons', 'that', 'pop'], buffer = ['and', 'eggs']$

Left_arc_{mark}: (5)

$stack = [root, 'likes', 'balloons', 'pop'], buffer = ['and', 'eggs']$

Right_arc_{acl}: (4)

$stack = [root, 'likes', 'balloons'], buffer = ['and', 'eggs']$

Shift: $\times 2$

$stack = [root, 'likes', 'balloons', 'and', 'eggs'], buffer = []$

Left_arc_{cc}: (6)

$tack = [root, 'likes', 'balloons', 'eggs'], buffer = []$

Right_arc_{conj}: (3)

$tack = [root, 'likes', 'balloons'], buffer = []$

Right_arc_{obj}: (2)

$tack = [root, 'likes'], buffer = []$

Right_arc_{root}: (2)

$tack = [root], buffer = []$

The length of the sequence is 14.

Q2

Start:

$stack = [root], buffer = ['John', 'likes', 'balloons', 'that', 'pop', 'and', 'eggs']$

Shift:

$stack = [root, 'John'], buffer = ['likes', 'balloons', 'that', 'pop', 'and', 'eggs']$

Left_arc_{nsubj}(1) :

$stack = [root], buffer = ['likes', 'balloons', 'that', 'pop', 'and', 'eggs']$

Right_arc_{root}:

$stack = [root, 'likes'], buffer = ['balloons', 'that', 'pop', 'and', 'eggs']$

Right_arc_{obj}(2):

$stack = [root, 'likes', 'balloons'], buffer = ['that', 'pop', 'and', 'eggs']$

Shift:

$stack = [root, 'likes', 'balloons', 'that'], buffer = ['pop', 'and', 'eggs']$

Left_arc_{mark}(5) :

$stack = [root, 'likes', 'balloons'], buffer = ['pop', 'and', 'eggs']$

Right_arc_{acl}(4):

$stack = [root, 'likes', 'balloons', 'pop'], buffer = ['and', 'eggs']$

reduce:

$stack = [root, 'likes', 'balloons'], buffer = ['and', 'eggs']$

Shift:

$stack = [root, 'likes', 'balloons', 'and'], buffer = ['eggs']$

Left_arc_{cc}: (6)

$stack = [root, 'likes', 'balloons'], buffer = ['eggs']$

Right_arc_{conj}: (4)

$stack = [root, 'likes', 'balloons', 'eggs'], buffer = []$

The length of the sequence is 11.