Tree Adjoining Grammars
Exercises

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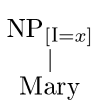
Exercise 1 (05.02.2016) *Consider the sentence (1-a). It has the two readings (1-b) (Mary wants to bring about a situation where she has read four books, no matter which ones) and (1-c) (there are four specific books such that Mary wants to read each of them).*

(1) a. *Mary wants to read four books.*
b. $\text{Mary'}(x) \wedge \text{want'}(\text{four'}(y, \text{book'}(y), \text{read'}(y)(x)))(x)$
c. $\text{Mary'}(x) \wedge \text{four'}(y, \text{book'}(y), \text{want'}(\text{read'}(y)(x))(x))$

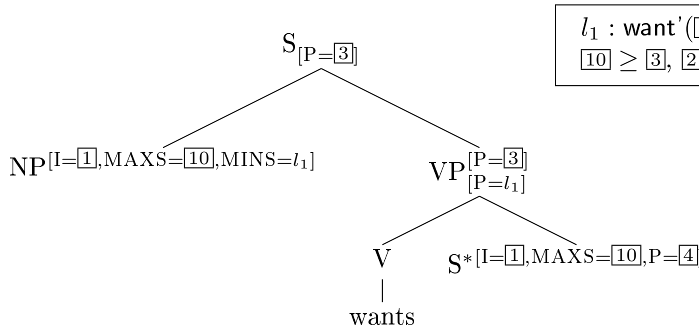
Show how the approach of LTAG with unification-based semantics can derive these readings. More precisely, give

1. *the elementary pairs of trees and semantic representations used for (1);*
2. *the derived tree and the derived underspecified semantic representation.*

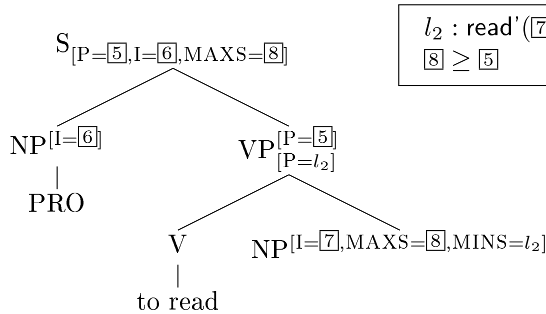
Solution:

1. 

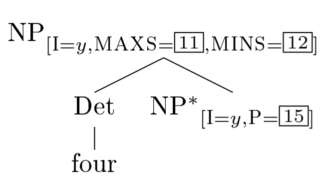
$\boxed{\text{Mary'}(x)}$



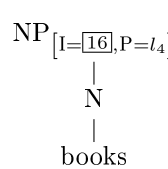
$l_1 : \text{want'}(\boxed{2})(\boxed{1}),$
$\boxed{10} \geq \boxed{3},\ \boxed{2} \geq \boxed{4}$



$l_2 : \text{read'}(\boxed{7})(\boxed{6}),$
$\boxed{8} \geq \boxed{5}$

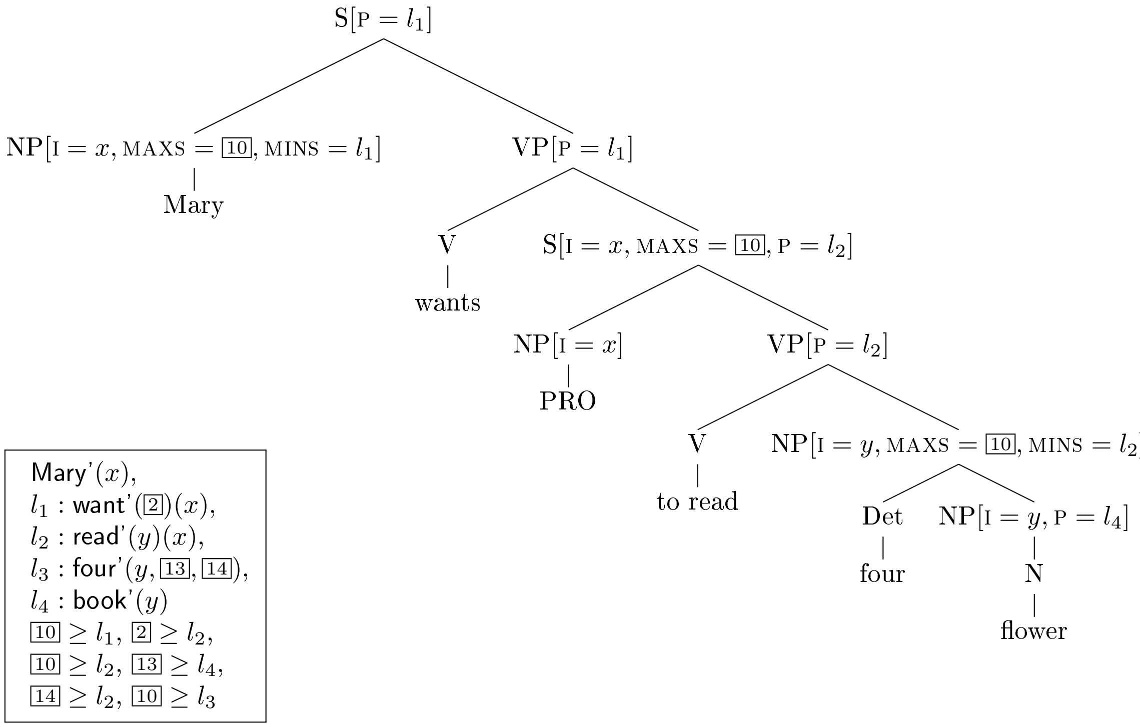


$l_3 : \text{four'}(y, \boxed{13}, \boxed{14}),$
$\boxed{13} \geq \boxed{15},\ \boxed{14} \geq \boxed{12},\ \boxed{11} \geq l_3$



$l_4 : \text{book'}(\boxed{16})$

2.



Exercise 2 (05.02.2016) *Consider the sentence (2-a). It has two possible scope readings, namely* every' *scoping over* think'*, which scopes in turn over* most'*, and* most' *scope over* a' *(possibly different castles for the different princesses) and, as a second possibility,* every' *scoping over* think'*, which scopes over* a'*, and* a' *scope over* most' *(the princesses own the same castle together).*

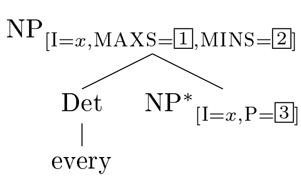
(2) *a.* *Every girl thinks most princesses own a castle.*
b. every' > think' > most' > a'
c. every' > think' > a' > most'

Show that the approach of LTAG with unification-based semantics derives exactly these readings. More precisely, give

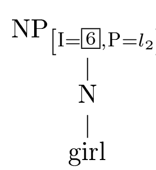
1. *the elementary pairs of trees and semantic representations used for (2-a);*
2. *the derived tree and the derived underspecified semantic representation.*

Solution:

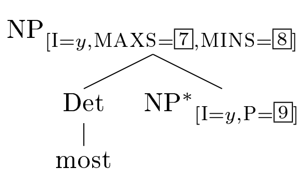
1.



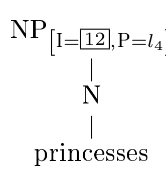
l_1 : every'(x, $\boxed{4}$, $\boxed{5}$),
$\boxed{4} \geq \boxed{3}$, $\boxed{5} \geq \boxed{2}$, $\boxed{1} \geq l_1$



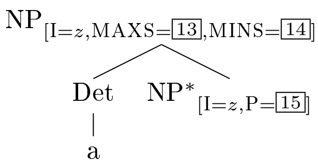
l_2 : girl'($\boxed{6}$)



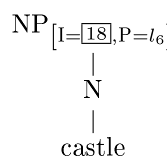
l_3 : most'(y, $\boxed{10}$, $\boxed{11}$),
$\boxed{10} \geq \boxed{9}$, $\boxed{11} \geq \boxed{8}$, $\boxed{7} \geq l_3$



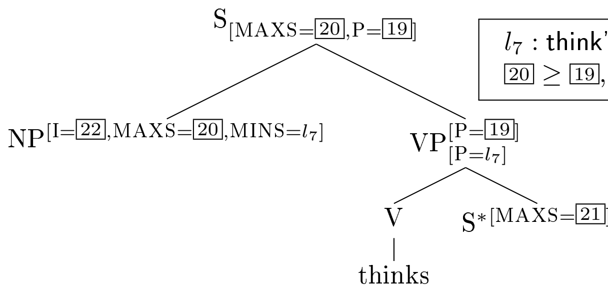
l_4 : princess'($\boxed{12}$)



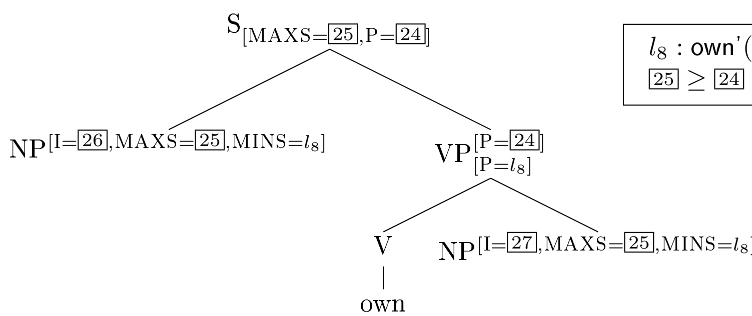
l_5 : a'$(z, \boxed{16}, \boxed{17})$,
$\boxed{16} \geq \boxed{15}$, $\boxed{17} \geq \boxed{14}$, $\boxed{13} \geq l_5$



l_6 : castle'$(\boxed{18})$

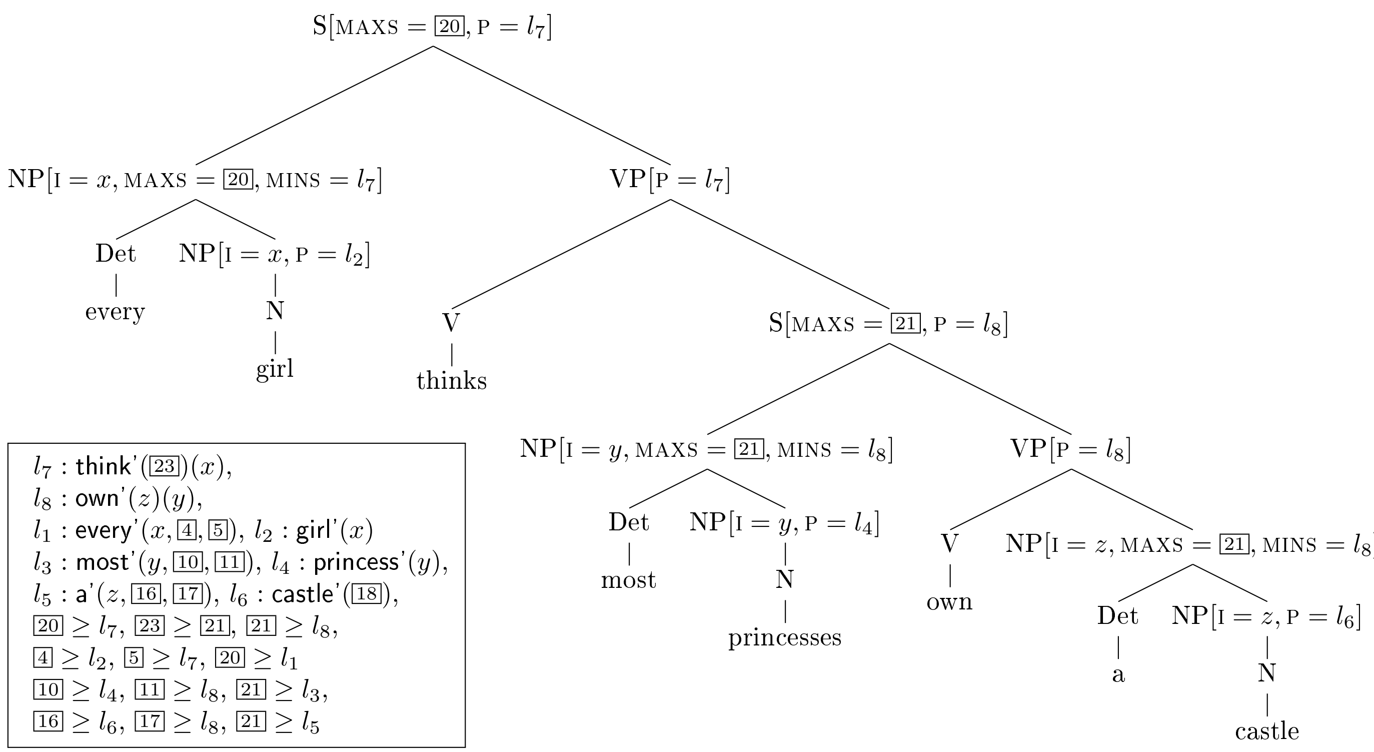


l_7 : think'$(\boxed{23})(\boxed{22})$,
$\boxed{20} \geq \boxed{19}$, $\boxed{23} \geq \boxed{21}$



l_8 : own'$(\boxed{27})(\boxed{26})$,
$\boxed{25} \geq \boxed{24}$

2.



l_7 : think'$(\boxed{23})(x)$,
l_8 : own'$(z)(y)$,
l_1 : every'$(x, \boxed{4}, \boxed{5})$, l_2 : girl'(x)
l_3 : most'$(y, \boxed{10}, \boxed{11})$, l_4 : princess'(y),
l_5 : a'$(z, \boxed{16}, \boxed{17})$, l_6 : castle'$(\boxed{18})$,
$\boxed{20} \geq l_7$, $\boxed{23} \geq \boxed{21}$, $\boxed{21} \geq l_8$,
$\boxed{4} \geq l_2$, $\boxed{5} \geq l_7$, $\boxed{20} \geq l_1$
$\boxed{10} \geq l_4$, $\boxed{11} \geq l_8$, $\boxed{21} \geq l_3$,
$\boxed{16} \geq l_6$, $\boxed{17} \geq l_8$, $\boxed{21} \geq l_5$