

# Problem Set 6

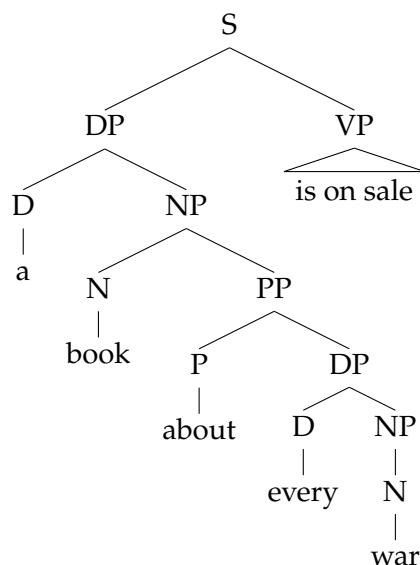
Due October 14 before class. Submit PDF on Luminus > Files > Student Submission > PS6.

(Problem 1 is possible without Lecture 8. Watch Lecture 8 before attempting problem 2.)

1. **Quantifiers in other positions:** Consider the following sentence and its inverse scope interpretation, paraphrased below:

- (1) A book about every war is on sale.  
 'For every war, there is a book about it on sale.'

Assume that its surface form (PF) is as follows:



Draw the LF tree that gives this interpretation and compute its truth conditions. For every node, give types, denotations, and the rule used. Use the following denotations:

- $\llbracket \text{is on sale} \rrbracket = \lambda x_e . \text{OnSale}(x)$  type  $\langle e, t \rangle$
- $\llbracket \text{about} \rrbracket = \lambda x_e . \lambda y_e . \text{About}(y, x)$  type  $\langle e, \langle e, t \rangle \rangle$
- $\llbracket \text{every} \rrbracket = \lambda P_{\langle e, t \rangle} . \lambda Q_{\langle e, t \rangle} . \forall x [P(x) \rightarrow Q(x)]$  type  $\langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle$
- $\llbracket \text{a} \rrbracket = \lambda P_{\langle e, t \rangle} . \lambda Q_{\langle e, t \rangle} . \exists x [P(x) \wedge Q(x)]$  type  $\langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle$

2. **Bound variables and quantifier scope:**

Consider example (2), which is multiply ambiguous.

- (2) A friend of his upset every boy.

There is a scope ambiguity between the two quantifiers — *a friend of his* ( $\exists$ ) and *every boy* ( $\forall$ ). The pronoun *his* could be free or bound by *every boy*. Because the sentence is

ambiguous in these two ways, we might expect  $2 \times 2 = 4$  readings. But instead, only 3 are possible:

	$\exists > \forall$	$\forall > \exists$
<i>his free</i>	○	○
<i>his bound</i>	×	○

- (a) Give predicate logic translations for the three available readings that this sentence has.
- (b) Explain why the fourth reading is unavailable (×).