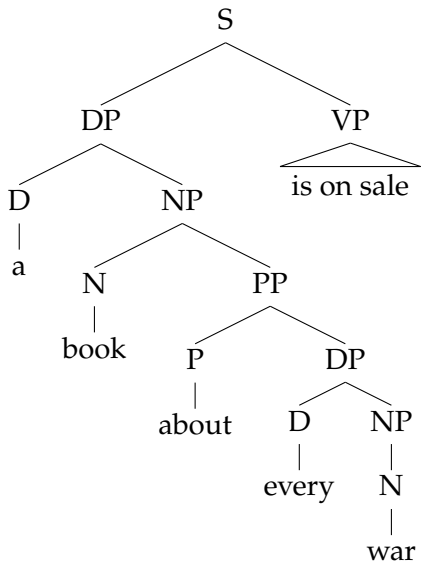
Movement: Practice problems

(Problem 1 is possible without Lecture 7. Watch Lecture 7 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:

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

	∃ > ∀	∀ > ∃
his free	◯	◯
his bound	×	◯

(a) Give predicate logic translations for the three available readings that this sentence has.

(b) Explain why the fourth reading is unavailable (×).