In this assignment, we will see two ways of modifying nouns: adjectival modification and modification by a relative clause. We will restrict ourselves to intersective adjectives like,

(1) blue := N/N : $\lambda p \lambda x.blue'x \wedge px$

Relative clauses also modify nouns; but they apply to the noun they modify from the right hand side:

(2) a. *who loves Mary* = $N\backslash N$: $\lambda p \lambda x.love'mary'x \wedge px$
b. *who(m) Mary loves* = $N\backslash N$: $\lambda p \lambda x.love'xmary' \wedge px$

Q1.

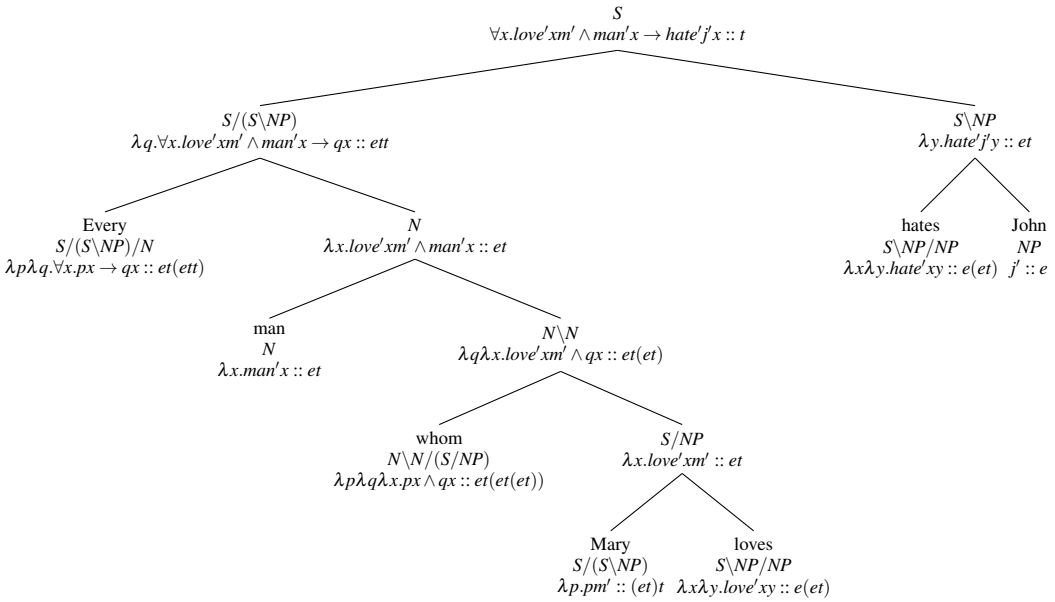
Derive the meaning of the sentence below. You are not required to pay attention to event semantics.

(3) Every man whom Mary loves hates John.

You now know about type raising and composition. Here you need these to derive a meaning for the fragment *Mary loves*, and the relative pronoun should first take this fragment as argument. You need to figure out the category of the relative pronoun. Give the category, interpretation, and semantic type for each node in your derivation tree.

Solution:

In this solution and the next, we take type-raising as an "on-demand" operation, and, therefore, do not use it when not needed.

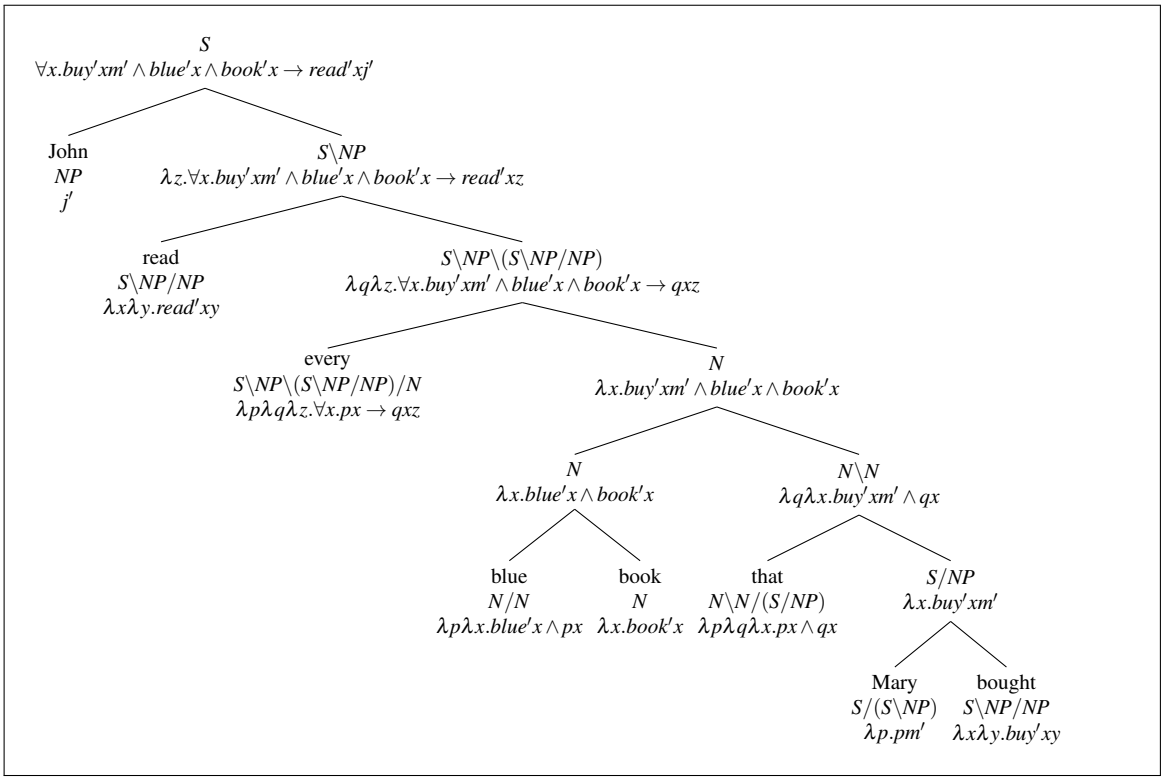


Q2.

Derive the meaning of the following sentence. Types can be skipped for this exercise.

(4) John read every blue book that Mary bought.

Solution:


S
∀x.buy′xm′ ∧ blue′x ∧ book′x → read′xj′
John
NP
j′
S\NP
λz.∀x.buy′xm′ ∧ blue′x ∧ book′x → read′xz
read
S\NP/NP
λxλy.read′xy
S\NP\(S\NP/NP)
λqλz.∀x.buy′xm′ ∧ blue′x ∧ book′x → qxz
every
S\NP\(S\NP/NP)/N
λpλqλz.∀x.px → qxz
N
λx.buy′xm′ ∧ blue′x ∧ book′x
N
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λqλx.buy′xm′ ∧ qx
blue
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λx.book′x
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N\N/(S/NP)
λpλqλx.px ∧ qx
S/NP
λx.buy′xm′
Mary
S/(S\NP)
λp.pm′
bought
S\NP/NP
λxλy.buy′xy