Semantic Theory 2025: Exercise 3

Due by: Wednesday, May 14 at 10:00 am (before class)

Question 1

Translate the following into λ-expressions. Use subscripts to indicate the types of the λ-bound variables (e.g. $\lambda x_e.P(x)$ for an e-type x).

a. $pink_{\langle\langle e,t\rangle,\langle e,t\rangle\rangle}$ (as in "Jumbo is a <u>pink</u> elephant"; the expression should have $pink^*_{\langle e,t\rangle}$ as the underlying first-order predicate)

b. $and_{\langle e,\langle e,\langle\langle e,t\rangle,t\rangle\rangle\rangle}$ (as in "John <u>and</u> Suzy danced"; the expression should incorporate $\wedge$ as the underlying operator)

c. $not_{\langle\langle e,t\rangle,\langle e,t\rangle\rangle}$ (as in "Mark did <u>not</u> like the party"; the expression should incorporate $\neg$ as the underlying operator)

Question 2

Translate the following sentences into λ-expressions, assuming the syntactic structure indicated by the brackets. Then use lambda conversions (β-/η-/α-conversion) to reduce to λ-free terms.

Use the terms you derived for *pink*, *and*, and *not* in Question 1. If you weren't able to derive those terms, you can simply use the predicates $pink'$, and', and not' (with the types indicated in Question 1).

Ignore the contribution of past/plural morphology, "is"/"are"/"did", and "a".

a. Jumbo [is a [pink elephant]]

b. [John and Suzy] danced

c. Mark did [not [like <u>the party</u>$_e$]]

d. [Tim [and Mary]] are [not [pink elephants]]