Homework 3

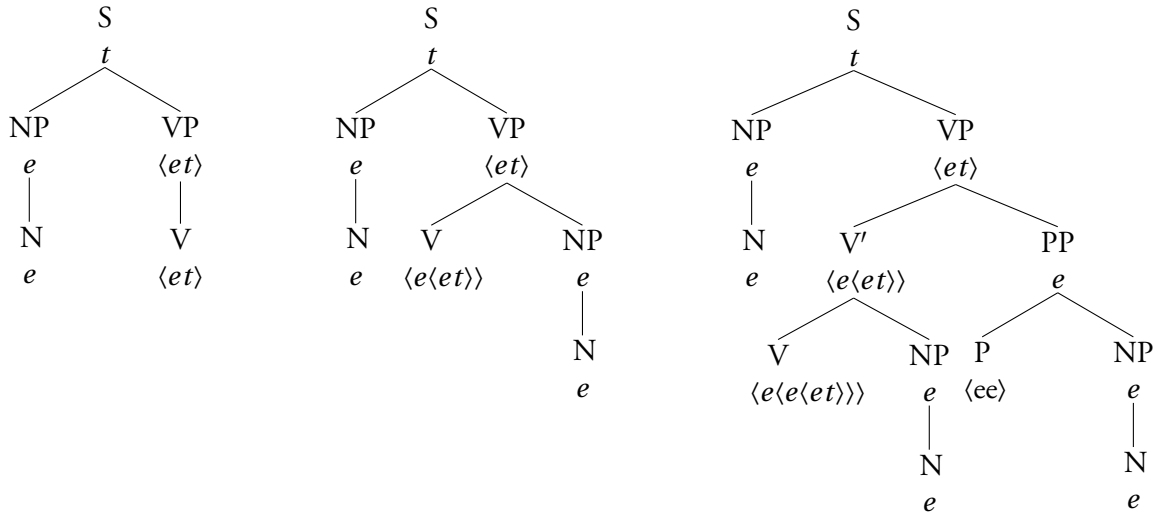
Semantics I, Fall 2009, JHU
Assigned: 9/23, Due: 9/30

[A] Book exercises Do exercises 1, 2 and 4 on pp. 39–40.

[B] Restructuring the type system (Note: despite all the text, what I am looking for here is reasonably simple.)

We have been assuming that the denotation of a sentence is type t – that is, a member of D_t. In other words, the meaning of a sentence is simply a truth value. We are calculating truth conditions in the sense that what our compositional process produces is a description of when the denotation of the sentence is true or false. Compositions for an intransitive, transitive, and ditransitive verb are schematized using the types in (1).

(1)



Possible world semantics takes a different perspective. A possible world is a way that reality could be, not necessarily matching the way it actually is. Instead of calculating a description of the conditions where a sentence is true or false, a possible world semantics would calculate the worlds at which it would be true. That is, the denotation of a sentence is a set of possible worlds, or equivalently, a characteristic function of such a set. If we introduce a new domain for possible worlds (D_s) and a corresponding type (s), we can give characteristic functions of sets of worlds a convenient label in our type system: $\langle st \rangle$.

Assume (for the purposes of this problem) that denotations of sentences have the type $\langle st \rangle$, i.e. they are members of $D_{\langle st \rangle}$. Start by giving an example of what the denotation of a full sentence would look like (you will need to give an appropriate lambda expression, making reference to the possible world argument on both the left and the right side of the period). Show how you would need to modify lexical entries in order to derive this kind of denotation for the S node, and show the revised type schemas for the trees based on (1). Give revised denotations for an intransitive verb, a transitive verb, and a ditransitive verb, as well as any other lexical revisions you might need to make. Do you need to revise the compositional rules at all?

Grad students (or undergrads for extra credit): come up with a way of converting an "intensional" meaning (of the type calculated in this problem) into an "extensional" meaning of the type assumed in the book.