1 Copular constructions

For each of the following analyses of *be*, provide a semantic parsetree for the sentence *Superman is Clark Kent* using any combination of Partee's type-shifters, assuming that *Superman* and *Clark Kent* both translate as expressions of type $e$.

i. $\langle \lambda x \lambda y (x = y) \rangle : \langle e, \langle e, t \rangle \rangle$

ii. $\langle \lambda f \lambda y (f y) \rangle : \langle \langle e, t \rangle, \langle e, t \rangle \rangle$

iii. $\langle \lambda y \lambda f (f y) \rangle : \langle e, \langle \langle e, t \rangle, t \rangle \rangle$

iv. the type-shifter $BE : \langle \langle e, t \rangle, \langle e, t \rangle \rangle$

2 Determiners and type-shifters

The following Japanese sentence is ambiguous between definite and indefinite interpretations of its subject. (The subject is also ambiguous between singular and plural, but let's set that aside.)

\[ \text{Hime wa kirei.} \]
\[ \text{princess TOPIC pretty} \]
\[ \text{‘The A princess is pretty.’} \]

Partee suggests that we might relate such ambiguities to type-shifting and the absence of an overt determiner. Your tasks:

i. Show that Partee's type-shifters can derive both of the above readings.

ii. Assess the extent to which it also follows, from your account and assumptions like those of fragment 1, that *a princess* in English cannot be interpreted as definite.
3 Intensionality and quantification

Suppose that John believes the governor of California is Arnold Schwarzenegger. Suppose also that John is listening to Jerry Brown (the actual governor of California) talk on the radio. Provide a logical translation of (B) using fragment 2 that comes out true in this scenario, and one where it comes out false in this scenario. Give the truth conditions associated with your translation.

(B) John believes that the governor of California is talking.

Notes:

• Feel free to extend fragment 2 with whatever constants you need.

• You needn’t provide the full compositional analysis, though you are welcome to do that.

• You needn’t worry about whether, as an empirical matter, the sentence has both readings. We’ll discuss the empirical part of this in class.

4 Final project areas and initial reading lists

The goal of this question is to get you started officially on your final project. Here’s what I’d like at this stage:

i. The topic area that you will be focussing on.

ii. The full citations for eight papers that you plan to read as part of the project.

• The citations should contain all the information that would appear in the bibliography of a published paper. LaTeX users are encouraged to submit the BibTeX entries.

• I am not expecting you to have read the papers already.

• The goal is for us to begin working together to find the best eight papers for you to focus on.

5 Simple necessarily

The denotation for necessarily given as part of fragment 2 is totally unrestricted. It simply demands that its propositional argument be true in all possible worlds. Revise this denotation using a Kratzerian modal base so that it expresses simple necessity.
6 Modality

Consider the following model, in which the worlds are \{\bullet_1 \ldots \bullet_{10}\} and the propositions \(p, q, r, t, s, u\) are indicated by labeled circles:

Additional assumptions:

- Modal base: \(f(\bullet_2) = \{s, (W - r)\}\)
- Ordering source: \(g(\bullet_2) = \{p\} = \{\bullet_2, \bullet_3, \bullet_6, \bullet_7\}\)

\[ \bullet_2 \prec g(\bullet_2) \bullet_5 \]
\[ \bullet_3 \prec g(\bullet_2) \bullet_5 \]
\[ \bullet_6 \prec g(\bullet_2) \bullet_5 \]
\[ \bullet_7 \prec g(\bullet_2) \bullet_5 \]

the \(p\) worlds are all equal with regard to \(g(\bullet_2)\)

Your tasks:

i. Finish this equation: \(\bigcap f(\bullet_2) =\)

ii. Is \(p\) a human necessity in \(\bullet_2\) given \(f\) and \(g\)?

iii. Is \(t\) a human necessity in \(\bullet_2\) given \(f\) and \(g\)?

7 A question from you

The reading for next time is Szabó 2010. Provide a question about it of the sort described on the syllabus: http://www.stanford.edu/class/linguist230b/syllabus.html#weekly
8 Extra credit challenge 1 [up to 1 point]

On assignment 2, you defined a method for going from negation of type \( \langle t, t \rangle \) to negations in any conjoinable type \( \langle \sigma, \tau \rangle \). This question probes that operation a little more deeply:

i. Write down a general type-shifter \( T \) for moving from sentential adverbs (type \( \langle \langle e, t \rangle, \langle e, t \rangle \rangle \)) to VP adverbs (type \( \langle \langle e, t \rangle, t \rangle, \langle e, t \rangle \rangle \)). Your type-shifter \( T \) should be such that, for any expressions \( \alpha : \langle t, t \rangle \), \( f : \langle e, t \rangle \), and \( x : e \),

\[
(\alpha (f \ x)) = (((T \ (\alpha)) f) \ x)
\]

ii. Can the reverse be done? That is, can one define a general type-shifter \( T \) from \( \langle \langle e, t \rangle, \langle e, t \rangle \rangle \) down to \( \langle t, t \rangle \) such that, for any expressions \( \alpha : \langle \langle e, t \rangle, \langle e, t \rangle \rangle \), \( f : \langle e, t \rangle \), and \( x : e \),

\[
((\alpha \ f) \ x) = ((T \ \alpha) (f \ x))
\]

Either define such a type-shifter or show that no such type-shifter exists.

9 Extra credit challenge 2 [up to 2 points]

One of the proposed solutions for assignment 2, problem 4, was to define a type-shifting function taking modifiers of type \( \langle \langle e, t \rangle, \langle e, t \rangle \rangle \) into modifiers of type \( \langle \langle \langle e, t \rangle, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle \) so that infinitival verbs and adverbials can modify VPs that have been lifted by one of Hendriks’ argument raising functions. This would allow universals to scope out of these constructions, but encountering a subject would cap off their scope climbing. Since tensed clauses have subjects in English, this would derive the needed restriction on scope taking.

Can a type-shifter be defined in such a way that modifiers lawfully do to VPs of type \( \langle \langle e, t \rangle, \langle e, t \rangle \rangle \) exactly what they would have done to VPs of type \( \langle e, t \rangle \)? Either define such a type-shifter or develop an argument that there is no such type-shifter exists.

In thinking about this, it might be useful to consider this easier case: a shift from \( \langle \langle e, t \rangle, \langle e, t \rangle \rangle \) into \( \langle \langle \langle e, t \rangle, t \rangle, \langle e, t \rangle, t \rangle \rangle \),

\[
\lambda M \lambda Q \lambda f \ (Q (M f))
\]

where \( M : \langle \langle e, t \rangle, \langle e, t \rangle \rangle \), \( Q : \langle \langle e, t \rangle, t \rangle \), and \( f : \langle e, t \rangle \).