SS 08 June 3rd, 2008

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Grammatikformalismen für die Computerlinguistik

Homework Assignment 6 Due: June 9th

Exercise 1. [1 point (2 and 3 extra credit, additional 2 points)] In example (9) on page 29 of Pollard and Sag's HPSG book we see a description of the SYNSEM LOCAL value of the verb *sees*. Like many descriptions in the book, it uses a number of abbreviatory conventions.

1. Write down a MoMo description (without abbreviations) which corresponds to the description in (9).
2. **(extra cred.)** As discussed in class, the part of the description under the CONTENT attribute is not consistent with the appendix version of the appropriateness conditions of possible CONTENT values of verbs. Fix the problem by modifying your MoMo description, i.e. make the description compatible with the appendix assumptions about the signature of verbal CONTENT values.
3. **(extra cred.)** Turn your MoMo description into a description that is satisfied by feature structures which represent the word *sees* in Pollard and Sag's grammar.

Exercise 2. [4 points] Translate the SPEC PRINCIPLE, page 62 (of the *Grammar Formalisms and Parsing* textbook), and the CONTROL THEORY, page 63, into the MoMo description syntax (under Pollard and Sag's signature).
Recall that in MoMo $\exists$ is written as `^`, and $\forall$ is written as `V` (capital v). $\exists X$ thus becomes `^X`, and $\forall X$ is written as `VX`. Variables are notated in MoMo with an initial capital letter and, apart from that, may consist of arbitrary strings of letters. Examples for variables in MoMo are: `H`, `Z`, `W`, `Head`, `Color`, `One`, `TWO`.
Please test the well-formedness of your descriptions in MoMo on the basis of an adequately large fragment of the signature of Pollard and Sag in MoMo. `Section 231`, `signature-fragment231.mmp`,[1] contains the necessary fragment of Pollard and Sag's signature.

Exercise 3. [3 points] Let Σ be our familiar initial signature of lists, birds, and pets. Take a simple abstract feature structure under Σ representing a singleton list with a green parrot on it.
Consider the following Σ descriptions and decide for each one whether our simple abstract feature structure under Σ satisfies it or is admitted by it (MoMo, `Section233`, `quant-exercise-233.mmp`).[2]

1. (a) `^X(X,color:green).`

[1] `milca.sfs.uni-tuebingen.de/A4/Course/Momo/mmps/Section231/signature-fragment231.mmp`
[2] `milca.sfs.uni-tuebingen.de/A4/Course/Momo/mmps/Section233/quant-exercise-233.mmp`

(b) `^X(color:green).`

2. (a) `VX((X:parrot)*>(X:color:green)).`
   (b) `^X((X:parrot)*>(X:color:green)).`
3. (a) `VX((X:parrot)*>(color:green))`
   (b) `VX((X:parrot)*>(^Y(Y:color:yellow))).`

Exercise 4. [3 points] Once again we presuppose the signature of lists and animals of Section 2.1.2. Consider the two descriptions shown in (a) and (b)

(a) `^X X:two`

(b) `VX X:two`

1. Draw two (distinct) feature structures under our signature: The first one should satisfy the description (a), the second one the description (b).
2. Is there a feature structure with more than one node which satisfies (a)? If your answer is yes, give an example. If your answer is no, show why not.
3. Is there a feature structure with more than one node which satisfies (b)? If your answer is yes, give an example. If your answer is no, show why not.