

Frank Richter:
Grammatikformalismen für die Computerlinguistik

Homework Assignment 5**Due: June 2nd**

Exercise 1. [3 + 3 points] In this exercise we want to think again about the meaning of grammars, i.e., the meaning that we ascribe to tuples consisting of a signature and a set of descriptions.

We are working with the signature that we have used most often so far, the signature of Section 2.1.2 with lists, birds and pets, available in MoMo in `Section241`, `birdsandpets-ex-241.mmp`.¹

First we will formulate a set of descriptions over that signature. Together they form our grammar of lists of birds and pets. We have the following principles:

1. Woodpeckers are red.
 2. Canaries are yellow.
 3. Parrots are green.
 4. Pets are brown.
 5. Non-empty lists contain one or two elements.
 6. The first element of each non-empty list is a canary.
- (a) Write this grammar down in MoMo notation. If you do this in MoMo, you might want to write all the descriptions on one single description card, since this is useful for part (b) of this exercise. From a pedantic formal point of view, what does your grammar consist of?
- (b) State the (complete!) set of feature structures admitted by the grammar. For readability, use pictures of concrete feature structures that correspond to the abstract feature structures admitted by the grammar. The easiest way to create and submit your solution is to use MoMo, which would give you the tools to also check whether each of your feature structures is really admitted by your grammar. Keep in mind that in order to check whether your feature structures model your grammar, all the descriptions of the grammar have to be on one single description card.

Exercise 2. [4 points] On page 33 of the HPSG book the authors discuss a description of the sentence *Kim gives Sandy Fido*. The description in their example (14) employs a number of abbreviatory conventions.

Translate (14) into a normal AVM description without abbreviations. You may keep the more convenient list notation of AVM descriptions with angled brackets

¹milca.sfs.uni-tuebingen.de/A4/Course/Momo/mmps/Section241/birdsandpets-ex-241.mmp

(instead of the more explicit notation with the FIRST and REST attributes) if you like. Make sure that your AVM description says exactly the same as (14). What do we know about the PHON value of the complete sentential phrase on the basis of the description?

Exercise 3. [2 points] On page 45 Pollard and Sag say:

[...] The sort *marking* in turn has the subsorts *marked* and *unmarked*. Here *unmarked* is the default value, in the sense that it is the value borne by words other than markers.

Write down the second sentence of the quote as a principle of grammar. You may use AVM notation or MoMo notation, whichever you prefer.

Exercise 4. [2 points] Take our familiar signature of lists, birds, and pets, e.g. Section253, file `birds-and-pets-excs253.mmp`.²

In the *Options* menu of MoMo you find a menu item *Top sort for lists*. Enter the top sort of lists in our signature. For your work with that signature, MoMo now gives you the option of using interchangeably either the usual syntactic notation for lists or the notation with square brackets, `[,]`.

Draw a list feature structure containing three animals. Then write two descriptions on separate description cards such that the feature structure satisfies them. Both descriptions should at least describe the color of each animal. The first description should use our normal syntax for the description of lists, the second one the new syntactic sugar with square brackets.

²milca.sfs.uni-tuebingen.de/A4/Course/Momo/mmps/Section253/birds-and-pets-exs253.mmp