

## Question 1

The file 'german.fcfg' contains the modified grammar with the introduced sub-categorization on verbs into transitive and intransitive verbs. The former take an object while the latter doesn't.

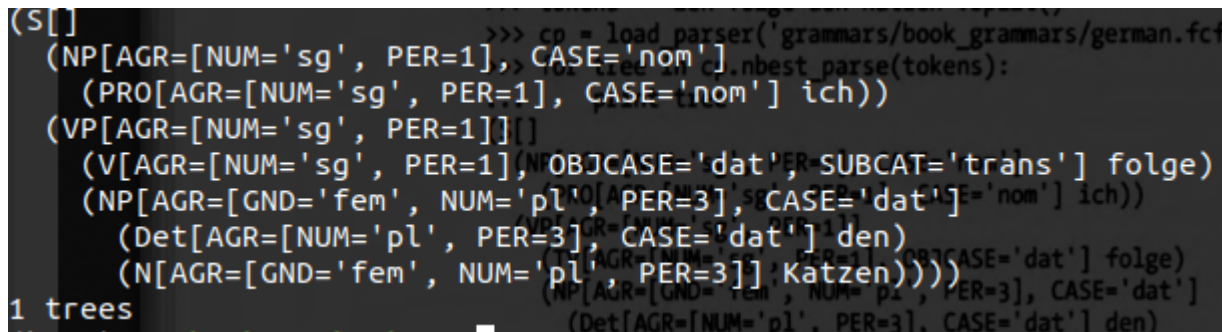


Figure 1: Parsing the sentence, 'ich folge den Katzen' using grammar in german.fcfg

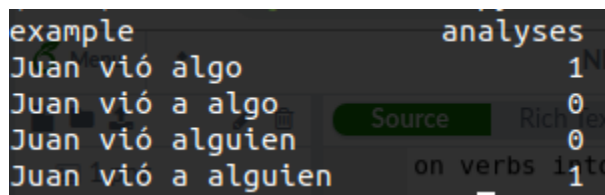
I checked the grammar on the sentence 'ich folge den Katzen'.

'folge' is a transitive verb, the sub-categorization of which was introduced into the rules. The parse tree illustrates that the transitive verb takes an object in the dative case.

If we use a sentence such as 'ich komme', it can be seen from the parse tree that is generated that since the intransitive verb does not take any object, this sentence is parsed. However, a sentence such as 'ich komme den Katzen', which is grammatically incorrect considering there is an object following the intransitive verb 'komme', it isn't parsed by the chart parser. This verifies that our grammar captures the sub-categorization of verbs into transitive and intransitive verbs well.

## Question 2

The VP and NP rules for this Spanish grammar were introduced as in the file 'spanish.fcfg'. The analysis of the given sentences in the test suite based on the modified grammar is as that illustrated in Figure 2.



example	analyses
Juan vió algo	1
Juan vió a algo	0
Juan vió alguien	0
Juan vió a alguien	1

Figure 2: Analysing sentences test-suite on modified Spanish grammar

Animacy is a binary semantic feature existing in certain languages such as Spanish, which expresses how sentient or alive the referent of a noun is. In Spanish, the preposition 'a' has a role as a governor of concrete animate direct objects, and thus, the modified grammar accounts for this by ensuring that the phrasal noun governed by this preposition is animate. However, the phrasal verb governs an inanimate noun, and the VP  $-i\ V[tense = past]N[-anim]$  rule ensures this logic.