

Homework 4
A Jess Parser
CSE 663, Advanced Knowledge Representation, Fall 2004
Maximum Points: 25 plus up to 15 Bonus Points
Due 9:00 AM, Wednesday, November 3, 2004

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1 Introduction

You are to use Jess to write a parser of a context-free fragment of English. To give you an idea of how this might be done, here is a possible beginning:

```
(clear)

;;; A template for a node of the parse tree.
(deftemplate Node (slot name) (slot cat)
  (multislot contents))

;;; The lexicon
(assert (Lex Lucy npr))

;;; The rules of the grammar
(defrule LexRule
  ?s <- (Node (cat String) (contents $?s1 ?lex $?s2))
  (Lex ?lex ?lcat)
  =>
  (bind ?new (gensym*))
  (modify ?s (contents $?s1 ?new $?s2))
  (assert (Node (name ?new) (cat ?lcat) (contents ?lex))))

;;; A sentence to be parsed
(assert (Node (name (gensym*)) (cat String)
  (contents a dog kissed young Lucy)))
```

```
;;; Print the original WMEs
(facts)
;;; Run the parser
(run)
;;; Print the final WMEs
(facts)
```

Submit your well-documented Jess program by 9:00 AM, Wednesday, November 3, 2004. You needn't hand in a paper as well.

2 The Assignment

1. (25 points) Use Jess to write a parser of a fragment of English defined by the following context-free grammar:

$$\begin{aligned} S &\leftarrow NP VP \\ NP &\leftarrow ART N \\ NP &\leftarrow ADJ NPR \\ VP &\leftarrow V NP \end{aligned}$$

Demonstrate your grammar on the sentence given in the above Jess program.

2. (5 bonus points) Increase the size of the grammar you implement by adding at least four more rules. Demonstrate your grammar on an interesting sentence of your choosing.
3. (5 bonus points) Make your grammar recursive. Demonstrate your grammar on an interesting sentence of your choosing.
4. (5 bonus points) Have Jess print your parse tree in an easier to read format than that produced by just calling `(facts)`.