

Natural Language Parsing

Foundations of Language Science and Technology (WS 2008/2009)

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- Given the following CFG grammar and input sentence (already tagged with POSes, POS tags are terminals in the grammar), please work out the complete parsing chart using the Earley's algorithm.

- $S \rightarrow NP VP$
- $NP \rightarrow Pron$
- $NP \rightarrow Det N$
- $NP \rightarrow NP PP$
- $VP \rightarrow V NP$
- $VP \rightarrow VP PP$
- $PP \rightarrow P NP$

	I Pron	saw V	a Det	girl N	with P	a telescope Det N		
i \ h	0	1	2	3	4	5	6	7
0	$S \rightarrow .NP VP$ $NP \rightarrow .Pron$ $NP \rightarrow .Det N$ $NP \rightarrow .NP PP$							
1	$NP \rightarrow Pron.$ $S \rightarrow NP .VP$ $NP \rightarrow NP .PP$	$VP \rightarrow .V NP$ $PP \rightarrow .P NP$ $VP \rightarrow .VP PP$						
2		$VP \rightarrow V.NP$	$NP \rightarrow .Pron$ $NP \rightarrow .Det N$ $NP \rightarrow .NP PP$					
3			$NP \rightarrow Det .N$					
4	$S \rightarrow NP VP.$	$VP \rightarrow V NP.$ $VP \rightarrow VP .PP$	$NP \rightarrow Det N.$ $NP \rightarrow NP .PP$		$PP \rightarrow .P NP$			
5					$PP \rightarrow P .NP$	$NP \rightarrow .Pron$ $NP \rightarrow .Det N$ $NP \rightarrow .NP PP$		
6						$NP \rightarrow Det .N$		
7	$S \rightarrow NP VP.$	$VP \rightarrow VP PP.$ $VP \rightarrow VP .PP$ $VP \rightarrow V NP.$ $VP \rightarrow VP .PP$	$NP \rightarrow NP PP.$		$PP \rightarrow P NP.$	$NP \rightarrow Det N.$ $NP \rightarrow NP .PP$		