

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), please work out the complete parsing chart using the bottom-up left-to-right 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	$S \rightarrow NP \ VP.$ $S \rightarrow NP \ VP.$	$VP \rightarrow VP \ PP.$ $VP \rightarrow VP \ .PP$ $VP \rightarrow V \ NP.$ $VP \rightarrow VP \ .PP$	$NP \rightarrow NP \ PP.$		$PP \rightarrow P \ NP.$	$NP \rightarrow Det \ N.$ $NP \rightarrow NP \ .PP$		