Natural Language Parsing

Foundations of Language Science and Technology (WS 2012/2013)

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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.

1. $S \rightarrow NP \quad VP$
2. $NP \rightarrow Pron$
3. $NP \rightarrow Det \quad N$
4. $NP \rightarrow NP \quad PP$
5. $VP \rightarrow V \quad NP$
6. $VP \rightarrow VP \quad PP$
7. $PP \rightarrow P \quad NP$

	I	saw	a	girl	with	a	telescope
	Pron	V	Det	N	P	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	$\mathbf{S \rightarrow NP\ VP}.$	$VP \rightarrow VP\ PP.$ $VP \rightarrow VP\ .PP$ $VP \rightarrow V\ NP.$	$NP \rightarrow NP\ PP.$ $NP \rightarrow NP\ .PP$		$PP \rightarrow P\ NP.$	$NP \rightarrow Det\ N.$ $NP \rightarrow NP\ .PP$		