Mike Roylance - Written Assignment 2

(1)

Jill	sang	the	baby	songs
n (Jill)				
NP -> n*				
NP (Jill)				
S -> NP* VP				
	v (sang)			
	VP -> v*			
	VP -> v* NP			
	VP -> v* NP NP			
	VP (sang)			
S -> NP VP*	----------			
S (Jill sang)	----------			
		art (the)		
		NP -> art* n		
		NP -> art* n n		
			n (baby)	
			NP -> n*	
		NP -> art n*	----------	
		NP -> art n* n	----------	
			NP (baby)	
			S -> NP* VP	
		NP (the baby)	----------	
		S -> NP* VP	----------	
	VP -> v NP*	----------	----------	
	VP (sang the baby)	----------	----------	
S -> NP VP*	----------	----------	----------	
S (Jill sang the baby)	----------	----------	----------	
	VP -> v NP* NP	----------	----------	
				n (songs)
				NP -> n*
		NP -> art n n*	----------	----------
				NP (songs)
				S -> NP* VP
	VP -> v NP NP*	----------	----------	----------
		NP (the baby sor	----------	----------
		S -> NP* VP		
	VP -> v NP*	----------	----------	----------
	VP (sang the baby	----------	----------	----------
S -> NP VP*	----------	----------	----------	----------
	VP (sang the baby	----------	----------	----------
S -> NP VP*	----------	----------	----------	----------
S (Jill sang the baby s	----------	----------	----------	----------
S (Jill sang the baby s	----------	----------	----------	----------

(2)

words: 18

P(I) - 2/9 (4/18)
4 (I) out of 18 words

P(what) - 1/9 (2/18)
2 (what) out of 18 words

P(meant | I) - 1/2 (2/4)
Found {I meant, I said, I said, I meant}

P(meant | what I) - 1/2
Found {what I said, what I meant}

P(percent | one hundred) - 1/1
Found {one hundred percent}

P(I | what) - 1/1 (2/2)
Found {what I, what I}

P(An | *) - 1/2
Found {* I, * An}

P(An | is) - 0/0
Found {} (never found “is an” in the sentences)

(3)

P(I | PRO) - 2/3 (4/6)
Found {I, what, I, I, I, what, I}

P(said | VB) - 2/5
Found {meant, said, said, meant, is}

P(PRO | *) - 1/2
Found {* PRO, * ART}

P(VB | PRO) - 2/3 (4/6)
Found {I/PRO meant/VB, what/PRO I/PRO, I/PRO said/VB, I/PRO said/VB, what/PRO I/PRO, I/PRO meant/VB}

P(NOUN | NUM) - 1/2
Found {one/NUM hundred/NUM, hundred/NUM percent/NOUN}

P(PRO | VB PRO) - 1/2 (2/2)
Found {meant/VB what/PRO I/PRO, said/VB what/PRO I/PRO}

P(ART | NOUN VB) - 0/0
Found {elephant/NOUN is/VB faithful/ADJ}

(4)

NOUN	FREQ	UNSMOOTHED PROB	SMOOTHED FREQ	SMOOTHED PROB
apple	800	(8/21) or (800 / 2100)	801	(89/234) or (801 / 2106)
banana	700	(7/21) or (700 / 2100)	701	(234/703) or (701 / 2106)
cherry	500	(5/21) or (500 / 2100)	501	(167/702) or (501 / 2106)
pear	70	(7/210) or (70 / 2100)	71	(3/89) or (71 / 2106)
mango	30	(3/210) or (30 / 2100)	31	(14/951) or (31/2106)
kiwi	0	0	1	(1/2106)

(5)

NLP is cool. (Top down)

S -> NP VP (found root)
NP -> noun (found end, look for match)
found noun(NLP)!
NP-Complete (yes, I went there)
S -> NP VP (looking for VP now...)
VP -> verb or VP -> verb ADJP
(hmm, let's produce two paths, will print out sequentially but could be paralleled)...
(VP-> verb path....
found verb(is)!
VP-Complete
S-Complete)
(VP -> verb ADJP path
found verb(is)!
ADJP -> adj
found adj(cool)!
VP-Complete
S-Complete)

We'd then return with the parse that had the same length as the sentence word count
(IE we'd consider the path that found NLP is cool as correct)

NLP is cool. (Bottom up)
found noun(NLP)!
nouns belong to... NP -> noun

so... found NP(NLP)!
NP belongs to... S -> NP VP
can't do anything with S -> NP VP yet, so moving on....
found verb(is)!
verb belongs to... VP -> verb and VP -> verb ADJP... let's check out each one in parallel
(VP -> verb
    so... found VP(is)!
    our grammar shows nothing immediately has a VP in it...
    perhaps our current active rules do... searching... found S -> NP VP
    so... found S(NLP is)!)
(VP -> verb ADJP
    can't do anything else right now, so let's look at next word...
    found adj(cool)!
    adj belong to ADJP it looks like, so
    ADJP -> adj
    found ADJP(cool)!
    our grammar shows nothing immediately has a ADJP in it...
    perhaps our current active rules do... searching... found VP -> verb ADJP
    so... found VP(is cool)!
    our grammar shows nothing immediately has a VP in it...
    perhaps our current active rules do... searching... found S -> NP VP
    so...found S(NLP is cool)!)

We'd then return with the parse that had the same length as the sentence word count (IE we'd consider the path that found NLP is cool as correct)

(6)

	Jill	**sang**	**the**	**baby**	**songs**
S -> *NP VP					
NP -> *n					
NP -> *art n					
NP -> *art n n					
	n (Jill)				
	NP -> n*				
	S -> NP *VP				
	VP -> *v				
	VP -> *v NP				
	VP -> *v NP NP				
		v (sang)			
		VP -> v*			
		VP -> v *NP			
		VP -> v *NP NP			
		NP -> *art n			
		NP -> *art n n			

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	Jill	sang	the	baby	songs
		NP -> *n			
		VP (sang)			
	S -> NP VP*	----------			
	S (Jill sang)	----------			
			art (the)		
			NP -> art *n		
			NP -> art *n n		
				n (baby)	
				NP -> art n*	
				NP -> art n *n	
			NP (the baby)	----------	
		VP -> v NP*	----------	----------	
		VP -> v NP * NP	----------	----------	
		VP (sang the ba	----------	----------	
	S -> NP VP*	----------	----------	----------	
	S (Jill sang the baby)	----------	----------	----------	
					n (songs)
					NP -> art n n*
			NP (the baby so	----------	----------
		VP -> v NP*	----------	----------	----------
		VP -> v NP NP*	----------	----------	----------
	S (Jill sang the baby	----------	----------	----------	----------
	S (Jill sang the baby	----------	----------	----------	----------