Compsci 334

Classwork 4

10 pts

You can work in a group and turn one in with all names.

1. Consider the context-free grammar G = (V,T,S,P), where V={S, A, B}, T= {a, b, c, d}, and P consists of

$$\begin{split} \mathbf{S} &\to \mathbf{A}\mathbf{S}\mathbf{d}\mathbf{B} \mid \mathbf{c}\mathbf{B}, \\ \mathbf{A} &\to \mathbf{a}\mathbf{A} \mid \lambda, \\ \mathbf{B} &\to \mathbf{b}\mathbf{B}\mathbf{b} \mid \lambda. \end{split}$$

(a) Calculate the FIRST and FOLLOW sets for all variables in the grammar.



$\begin{array}{c c} S & \mathcal{Q}_1 C & \mathcal{Q}_2 \\ \hline A & \mathcal{Q}_1 & \mathcal{Q}_2 \\ \hline \end{array}$		FIRST	FOLLOW	
A Q A A C	\mathbf{S}	Q1C	d,\$	
	А	air	MiC,	
	В	J'X	6.Sid	

(b) Calculate the LL(1) Parse Table for this grammar.

	a	b	с	d	\$
S	FSDB		ASJAB		
Α	d		2		
В	('	636,R	C	\mathcal{I}	R

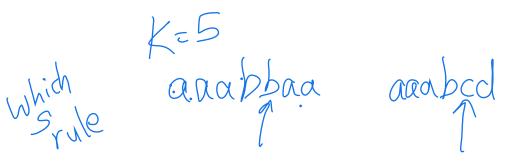
(c) Explain why this grammar is not LL(1).

Two more problems on the back!

2. Consider the grammar G = (V,T,S,P), where V={S, A, B}, T= {a, b, c, d}, and P consists of

$$S \rightarrow aBaa \mid Acd, A \rightarrow aA \mid b, B \rightarrow aabB \mid b.$$

This grammar is LL(k) for what value of k?



- 3. Consider the grammar G = (V,T,S,P), where V={S, A, B}, T= {a, b, c}, and P consists of
 - $$\begin{split} \mathbf{S} &\rightarrow \mathbf{A}\mathbf{b}\mathbf{B} \mid \mathbf{a}\mathbf{A}\mathbf{B}\mathbf{a}, \\ \mathbf{A} &\rightarrow \mathbf{a}\mathbf{A} \mid \mathbf{a}\mathbf{A}\mathbf{a} \mid \lambda, \\ \mathbf{B} &\rightarrow \mathbf{c}\mathbf{a}\mathbf{B} \mid \mathbf{b}. \end{split}$$

This grammar is LL(k) for what value of k?

not LL(K) for any K arbitrony no. of A's to start