7.1. $G = (N, \Sigma, S, P)$ Cafourek

$N = \{S, A, B, C, D\}$, $\Sigma = \{a, b, c\}$

P: $S \to AB \mid CD \mid AC$

$A \to AC \mid a$

$B \to BD \mid b$

$C \to AD \mid a$

$D \to BA \mid b$

G je v chomského norm. tvaru, protože každé pravidlo je typu

$A \to BC$ nebo $A \to w$,

A, B, C jsou neterminály a w je terminál.

Alg. CYK tedy můžeme použít ihned.

CYK alg.

a) $w_1 = baaba$

b	a	a	b	a
B,D	A,C	A,C	B,D	A,C
X_{11}	X_{22}	X_{33}	X_{44}	X_{55}
D	S,A	S,C	D	
$X_{1,2}$	$X_{2,3}$	$X_{3,4}$	$X_{4,5}$	
D	S,A,C	C,S		
$X_{1,3}$	$X_{2,4}$	$X_{3,5}$		
D	S,A,C			
$X_{1,4}$	$X_{2,5}$			
D				
$X_{1,5}$				

$S \notin X_{1,5}$, takže slovo w_1 není generováno gramatikou G.

$X_{1,2} = \{A \mid A \Rightarrow^* a_1 a_2\}$

$A \Rightarrow BC$ $B \Rightarrow^* a_1$, $C \Rightarrow^* a_2$ iff $B \in X_{11}, C \in X_{22}$

$X_{1,3} = \{D \mid D \Rightarrow^* a_1 a_2 a_3\}$

$D \Rightarrow EF$ $E \Rightarrow^* a_1$, $F \Rightarrow^* a_2 a_3$ iff $E \in X_{11}, F \in X_{2,3}$

$E \Rightarrow^* a_1 a_2$, $F \Rightarrow^* a_3$ iff $E \in X_{1,2}, F \in X_{3,3}$

$X_{1,4} = \{G \mid G \Rightarrow^* a_1 a_2 a_3 a_4\}$

$G \Rightarrow HI$ $H \Rightarrow^* a_1$, $I \Rightarrow^* a_2 a_3 a_4$ iff $H \in X_{11}, I \in X_{2,4}$

$H \Rightarrow^* a_1 a_2$, $I \Rightarrow^* a_3 a_4$ iff $H \in X_{1,2}, I \in X_{3,4}$

$H \Rightarrow^* a_1 a_2 a_3$, $I \Rightarrow^* a_4$ iff $H \in X_{1,3}, I \in X_{4,4}$

$X_{1,5} = \{J \mid J \Rightarrow^* a_1 a_2 a_3 a_4 a_5\}$

$J \Rightarrow KL$ $K \Rightarrow^* a_1$, $L \Rightarrow^* a_2 a_3 a_4 a_5$ iff $K \in X_{11}, L \in X_{2,5}$

$K \Rightarrow^* a_1 a_2$, $L \Rightarrow^* a_3 a_4 a_5$ iff $K \in X_{1,2}, L \in X_{3,5}$

$K \Rightarrow^* a_1 a_2 a_3$, $L \Rightarrow^* a_4 a_5$ iff $K \in X_{1,3}, L \in X_{4,5}$

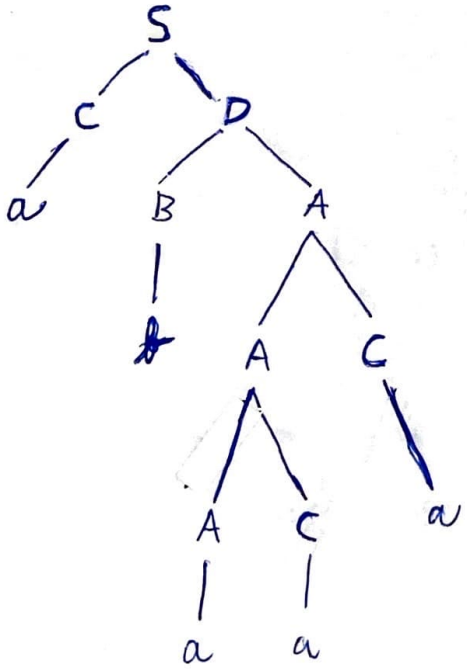
$K \Rightarrow^* a_1 a_2 a_3 a_4$, $L \Rightarrow^* a_5$ iff $K \in X_{1,4}, L \in X_{5,5}$

b) $w_2 = abaaa$

a	b	a	a	a
A,C	B,D	A,C	A,C	A,C
X_{11}	X_{22}	X_{33}	X_{44}	X_{55}
S,C	D	S,A	S,A	
$X_{1,2}$	$X_{2,3}$	$X_{3,4}$	$X_{4,5}$	
C,S	D	S,A		
$X_{1,3}$	$X_{2,4}$	$X_{3,5}$		
C,S	D			
$X_{1,4}$	$X_{2,5}$			
C,S				
$X_{1,5}$				

$\S\ S \in X_{1,5}$, takže slovo w_2 je generováno gramatikou G.

derivační strom:



levá derivace:

$S \Rightarrow CD \Rightarrow aD \Rightarrow aBA \Rightarrow abA \Rightarrow abAC \Rightarrow abAAC \Rightarrow$

$\Rightarrow abaAC \Rightarrow abaaC \Rightarrow abaaa$