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EX. 7.1.1

Find a grammar equivalent to

$S \rightarrow AB \mid CA$
$A \rightarrow a$
$B \rightarrow BC \mid AB$
$C \rightarrow aB \mid b$

with no useless symbols.

Basis : $A \rightarrow a$
$C \rightarrow a \mid b$
=> A dan C berguna

Induksi : S teridentifikasi berguna, karena :
$S \rightarrow CA$,
$S \rightarrow a \mid b$

Hasil : $S \rightarrow CA$
$A \rightarrow a$
$C \rightarrow b$

EX. 7.1.2

Begin with the grammar :

$S \rightarrow ASB \mid \varepsilon$
$A \rightarrow aAS \mid a$
$B \rightarrow SbS \mid A \mid bb$

a.) Eliminate ε-Productions
Basis : S adalah nullable ($I \rightarrow \varepsilon$)
A, B tidak nullable
Hasil : $S \rightarrow ASB \mid AB$
$A \rightarrow aAS \mid aA \mid a$
$B \rightarrow SbS \mid bS \mid Sb \mid A \mid bb \mid b$

b.) Eliminate any unit productions
unit. prod : $B \rightarrow A$
Hasil : $S \rightarrow ASB \mid AB$
$A \rightarrow aAS \mid aA \mid a$
$B \rightarrow SbS \mid bS \mid Sb \mid bb \mid b \mid aAS \mid aA \mid a$

c.) Eliminate any useless symbols

Basis : A dan B berguna, karena :

$A \to a$

$B \to bb \mid b \mid a$

Induksi : S berguna, karena :

$S \to ASB \mid AB$

Tidak ada useless symbol

Grammar tidak berubah

d.) CNF

Introduce $C \to a$ dan $D \to b$

$S \to ASB \mid AB$

$A \to CAS \mid CA \mid a$

$B \to SDS \mid DS \mid SD \mid b \mid CAS \mid CA \mid a$

$C \to a$

$D \to b$

Split CAS, ASB, SDS

$S \to AE \mid AB$

$A \to CF \mid CA \mid a$

$B \to SG \mid DS \mid SD \mid b \mid CF \mid CA \mid a \mid DD$

$C \to a$ $\quad E \to SB$ $\quad G \to DS$

$D \to b$ $\quad F \to AS$

EX . 7.4.3

Use the CYK algorithm to determine each of the following strings is in L(G) :

a.) ababa

C,A,S				
B	B			
B	S,C	B		
S,C	A,S	S,C	A,S	
A,C	B	A,C	B	A,C
a	b	a	b	a

"ababa" terdapat pada L(G)

b.) baaab

S,C				
A,S,C	S,C			
–	S,A,C	B		
A,S	B	B	S,C	
B	A,C	A,C	A,C	B
b	a	a	a	b

"baaab" terdapat pada L(G)

c.) aabab

S,C				
C,A,S	B			
B	B	S,C		
B	S,C	A,S	S,C	
A,C	A,C	B	A,C	B
a	a	b	a	b

"aabab" terdapat pada L(G)