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CNC - Formal Lang
Homework 6

19. Convert the grammar G to Chomsky normal form.

G: S -> aA | ABa
A -> AA | a
B -> AbB | bb

S_0 -> S
N_a -> a
N_b -> b
B_1 -> AN_b
A_1 -> AB
S -> N_aA | AB
A -> AA | a
B -> B_1B | N_bN_b

27. Let G be the grammar

G: S -> A | B
A -> aaB | Aab | Aba
B -> bB | Bb | aba

a) Give a regular expression for L(G).

(aab*abab*)+(ab|ba)*|b*abab*

b) Construct a grammar G' that contains no left-recursive rules and is equivalent to G.

S -> A | B
A -> A_1A_2
A_1 -> Aab | aaB -> aBA_1^1
A_1^1 -> abA_1^1 | λ
A_2 -> Aba | aaB -> aBA_2^1
A_2^1 -> baA_2^1 | λ
B -> B | B_1
B_1 -> Bb | aba -> $abaB_1^1$
B_1^1 -> bB_1^1 | λ

30. Construct a Greibach normal form grammar equivalent to

S -> aAb | a
A -> SS | b

33. Convert the Chomsky normal form grammar G to Greibach normal form. Process the variables according to the order S, A , B.

G: S -> BA | AB | λ