Design CFG for the Following Languages

HOMEWORK
05/10/15
All Sections

(1) $a^n \# b^n \quad n \geq 0$

(2) $L = \{w \mid w$ contains equal number of a's and b's$\}$

(3) $\Sigma = \{0,1\}$ $L = \{w \mid w$ contains at least three 1's.$\}$

(4) $L = \{w \in \{0,1\}^* \mid W = VV^R$ where $V \in \{0,1\}^*\}$

(5) $L = \{w \in \{0,1\}^* \mid |w|$ is odd and '0' is the middle char$\}$

(6) $L = \phi$

(7) $L = \{$language of balanced parenthesis$\}$ $\Sigma = \{(,)\}$

(8) $L = \{0^n 1^m \mid 2n \leq m \leq 3n\}$

(9) $L = \{a^i b^j c^k \mid i,j,k \geq 0$ and $i=j$ OR $i=k\}$

(10) $L = \{a^i b^j c^k \mid i,j,k \geq 0$ and $i+j=k\}$

(11) $T = \Sigma = \{0, 1, U, *, (,), \lambda\}$

$L = \{$Set of all valid regular expression$\}$

Do a derivation for $(0U(01)^*1)^*$

(12) $L = \{a^n b^{2n} \mid n \geq 0\}$

(13) L = Even length strings of $\{0,1\}$

(14) L = all binary strings with even number of 0's

(15) L = if string starts with a '0', what remains has odd number of 0's.

(16) $L = \{a a^* b b^*\}$

(17) $L = \{$strings are not of the form $0^i 1^j$ where $i, j \geq 0$ and are of one of the following forms

(i) contains 10

(ii) is only 0's

(iii) is only 1's.

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(18) $L = \{w \mid w$ contains even no. of '0's and even no. of '1's.$\}$

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(19) $L = \{0^i 1^j 0^k \mid i + k = j\}$

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(20) $L = \{w \in \{0,1\}^* \mid$ each block of '0's is followed by at least the same number of '1's.$\}$

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(21) $L = \{wa \mid w \in \{a, b\}^*\}$

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(22) $L = \{\{1^n 0^n \mid n \geq 0\} \cup \{0^n 1^n \mid n \geq 0\}\}$

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(23) $L = \{$ old fortran identifiers in which 1st letter is a capital alphabet followed by up to 5 more digits or letters.$\}$

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(24) $L =$ EvenEven (from slide 3)

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(25) $L = \{a^n b^m \mid 0 \leq n \leq m \leq 2n\}$

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(26) $L = \{a^n b^m c^m d^{2n} \mid n > 0, m > 0\}$

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(27) $L = \{(ab)^n (c b^{m_n})^n \mid n \geq 0 \; m_n > 0\}$

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(28) $L = a^+ b^*$

(29) strings in L do not contain substring 'abc'
$\Sigma = \{a, b, c\}$

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(30) Show G is ambiguous

G:

$S \to AA$

$A \to AAA$

$A \to a \mid bA$

$A \to Ab$