PES UNIVERSITY, Bangalore

(Established under Karnataka Act No. 16 of 2013)

Department of Computer Science & Engineering

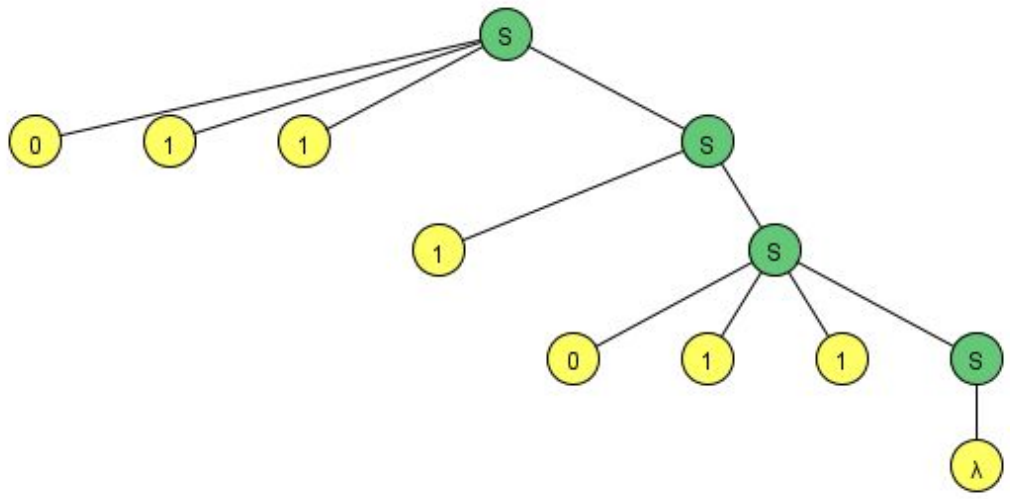
Automata Formal Languages & Logic

Q&A

1. Construct right-linear or left-linear grammars for the regular language of binary strings in which every 0 is followed by 11. Construct a parse tree for the string 0111011

   Solution:

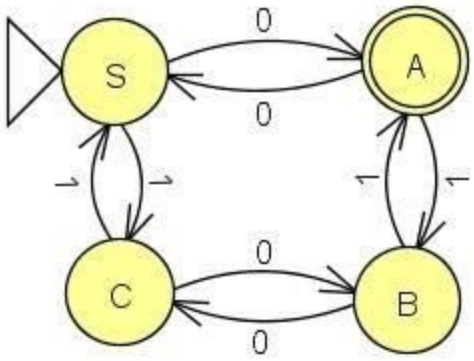
LHS		RHS
S	$\longrightarrow$	1S
S	$\longrightarrow$	011S
S	$\longrightarrow$	λ



2. Match the Regular expression with regular grammar.

Regular Expression	Regular Grammar
0*(1(0+1))*	S->0S|A| λ A->1B B->0A|1A|0|1
0*(10)*1(0)*	S->0A A->10A0|B B->1
(0+10*10*)*	S->1A|0S| λ A->1S|0A
(1+0)*10(1+0)*	S->0S|1A A->1A|0B B->1A|0B| λ
(0+1(01*0)*1)*	S->0S|1A| λ A->1S|0B B->0A|1B

3. Convert the automata to regular grammar.



Solution:

S-0A|1C

C->1S|0B

B->0C|1A

A->0S|1B| λ

4. Convert the regular grammar to finite automata.

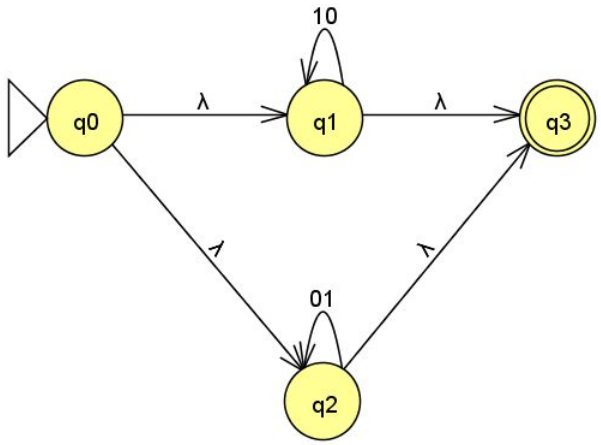
   S->A|B

   A->01A| λ

   B->10B| λ

Solution:

NFA:



DFA: