A

PRACTICAL FILE

ON

Theory of Computation – CS501

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF

THE DEGREE OF

BACHELOR OF TECHNOLOGY

(Computer Science & Engineering)

SUBMITTED TO

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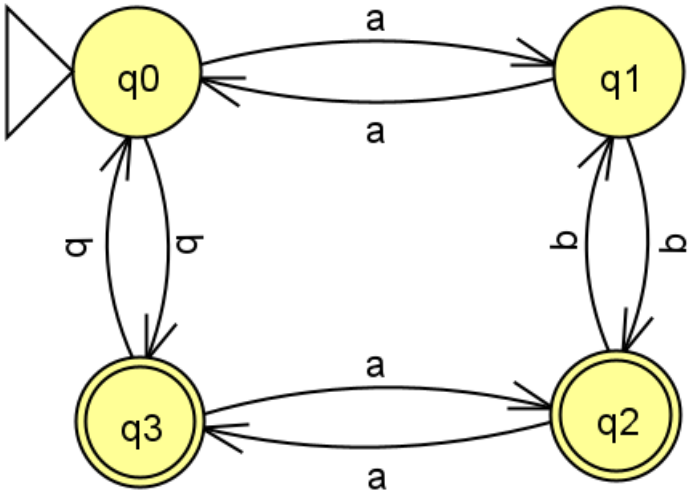
8.	Construct a Mealy machine which takes a binary number and replaces the first 1 with a 0 from every substring starting with 1. For example, 0001001110 becomes 0000000110.	11		

EXPERIMENT NO. 1

Problem : Construct a DFA for the language L={a m b n : m >= 0, n > 0, n is odd}. Design a DFA that recognizes that language of any number of a's followed by any odd number of b's.

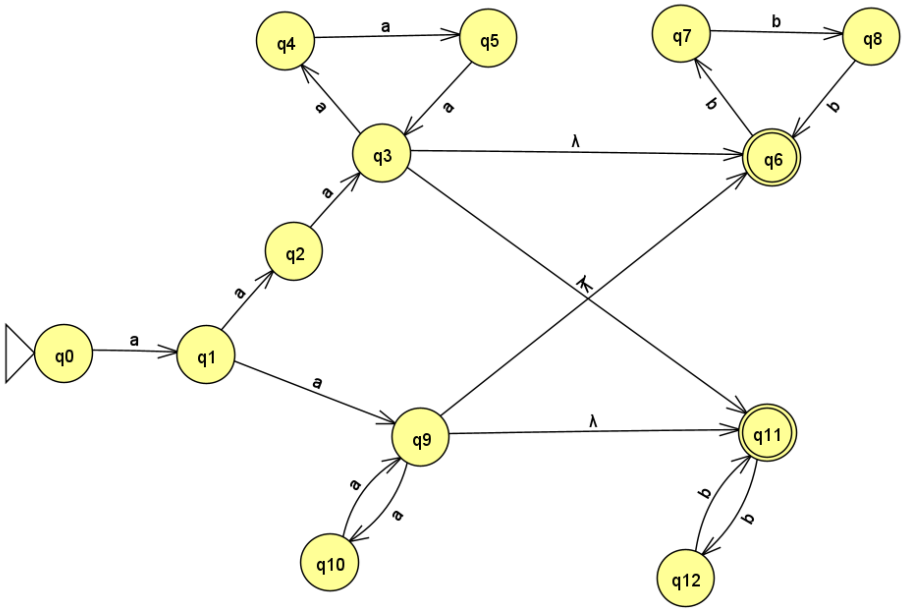
Solution :



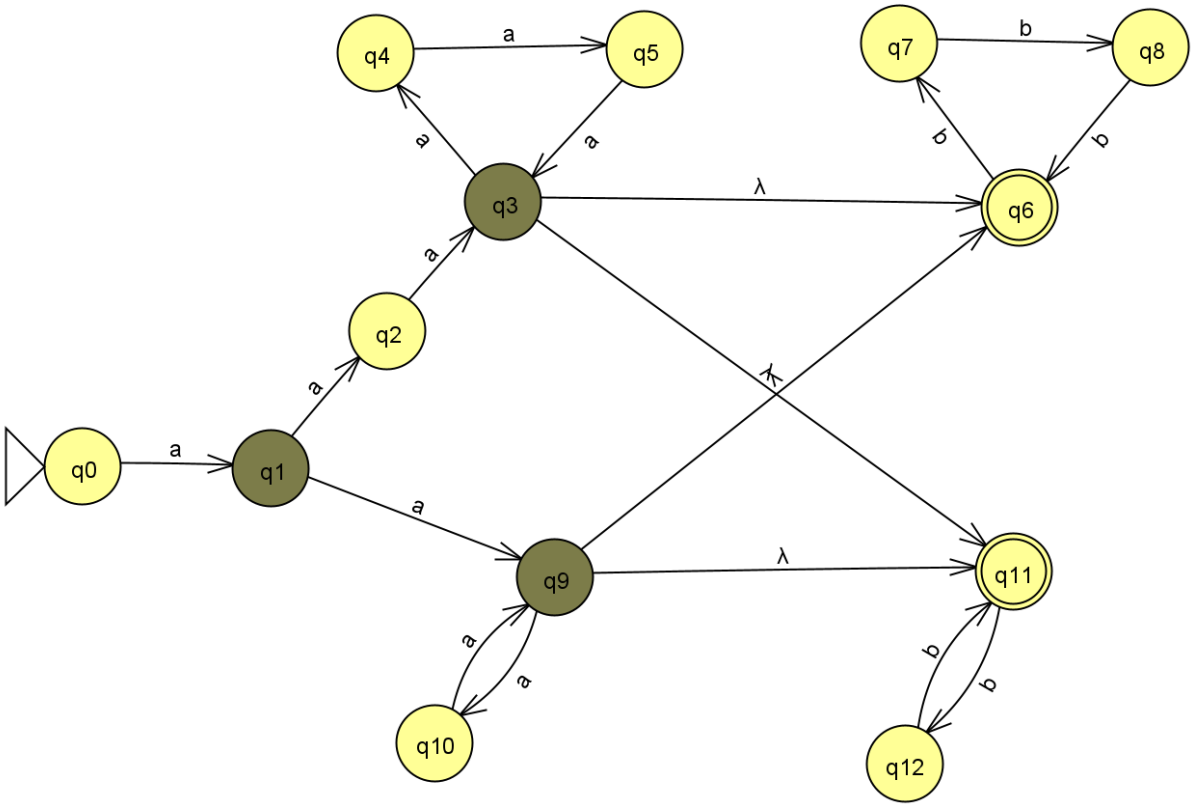
Input	Result
b	Accept
ab	Accept
abbb	Accept
abbba	Accept
babb	Accept
bbab	Accept
bbbabbabb	Accept

EXPERIMENT NO. 2

Problem : Determine the given finite automata is non-deterministic in nature through JFLAP.

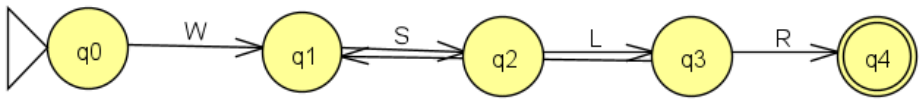


Solution : Non-Deterministic states are highlighted

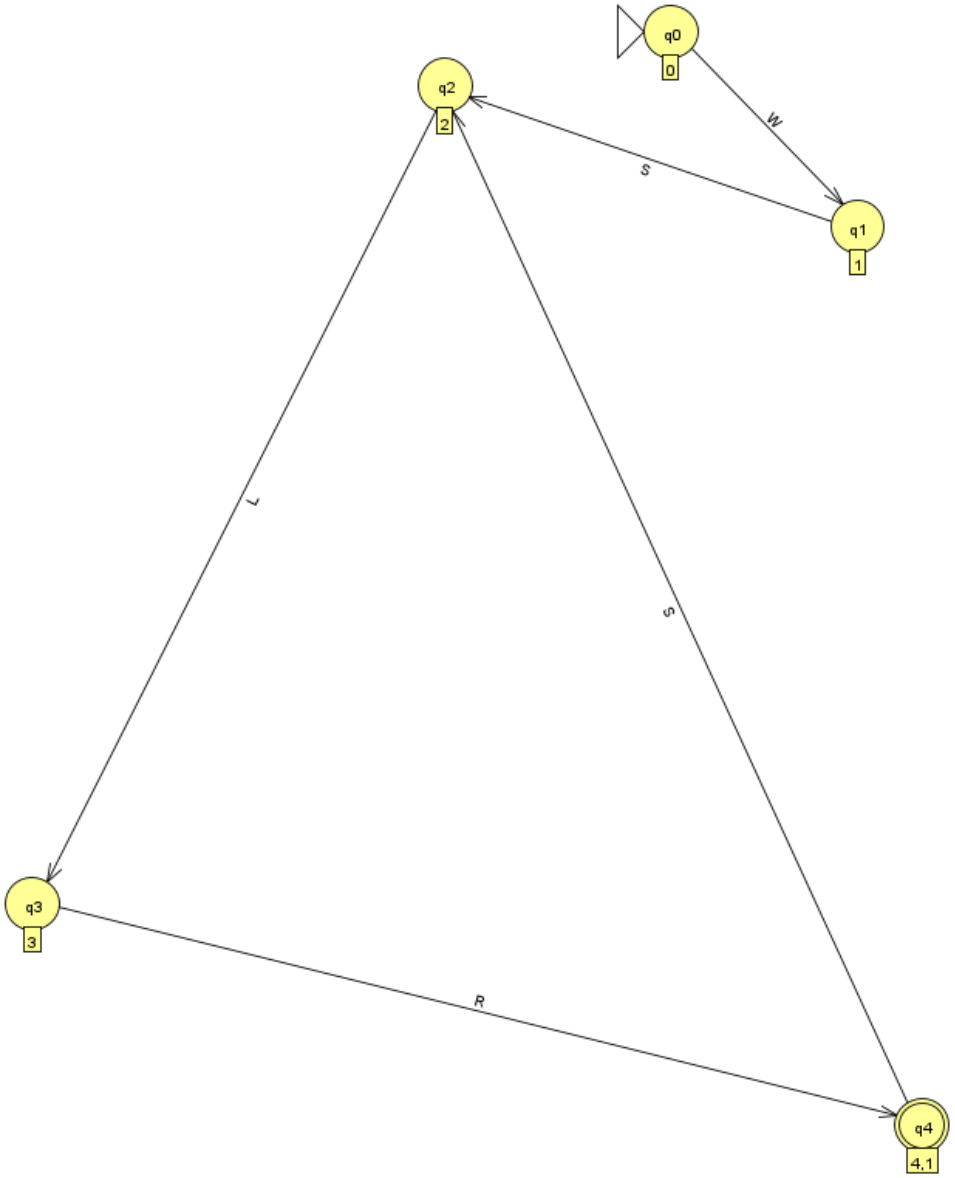


EXPERIMENT NO. 3

Problem : Convert the given NFA as shown in figure into corresponding DFA.

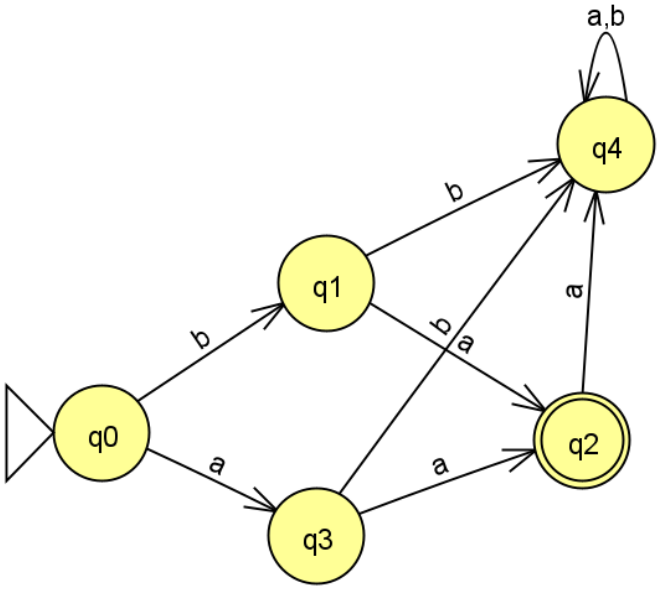


Solution :

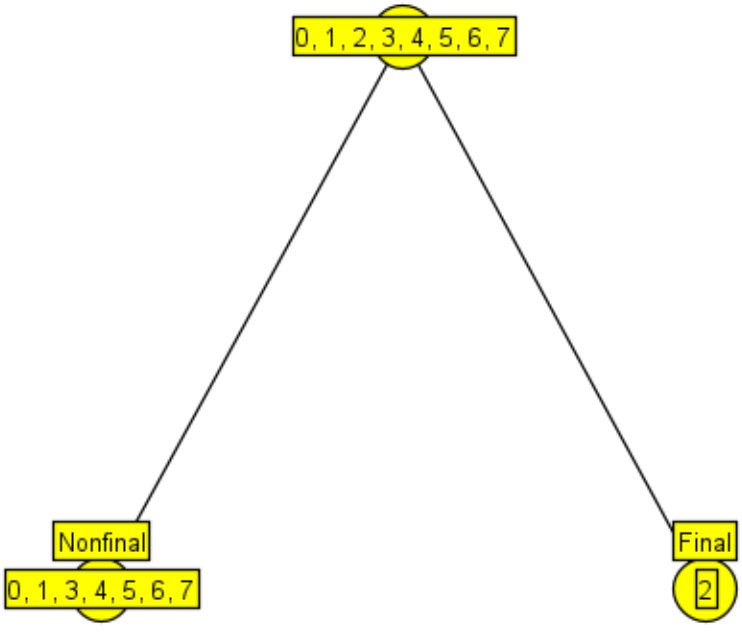


EXPERIMENT NO. 4

Problem : Minimize the given DFA.

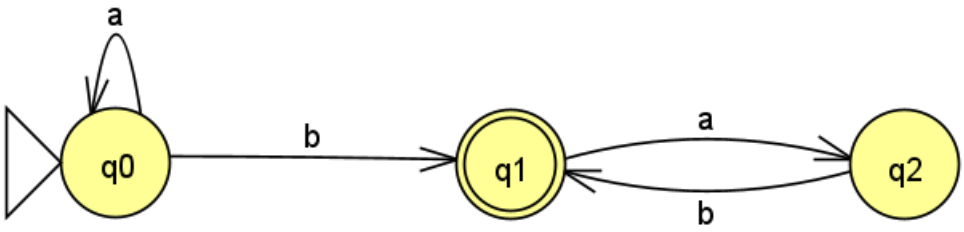


Solution : Minimized DFA is given below :



EXPERIMENT NO. 5

Problem : Convert the following DFA into regular grammar.

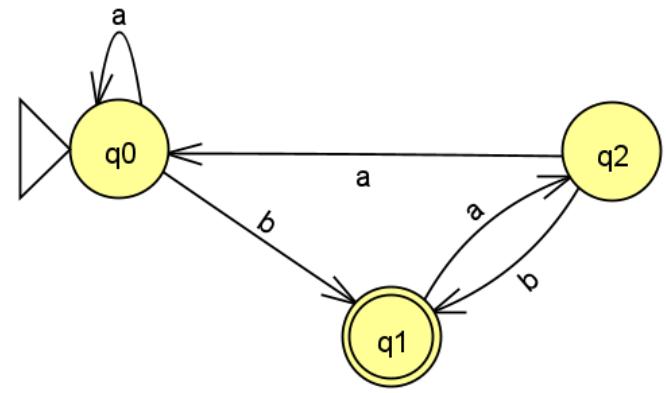


Solution :

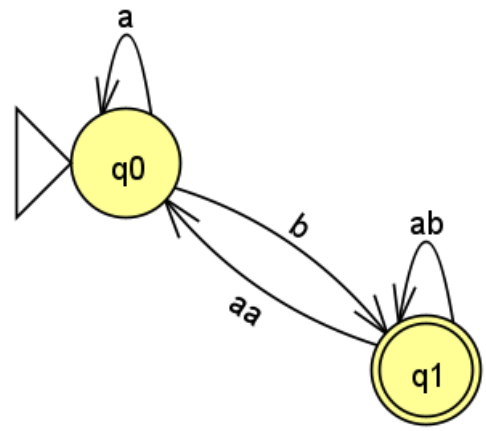
LHS		RHS
S	→	aS
A	→	λ
B	→	bA
S	→	bA
A	→	aB

EXPERIMENT NO. 6

Problem : Convert the following DFA into regular expression.



Solution :

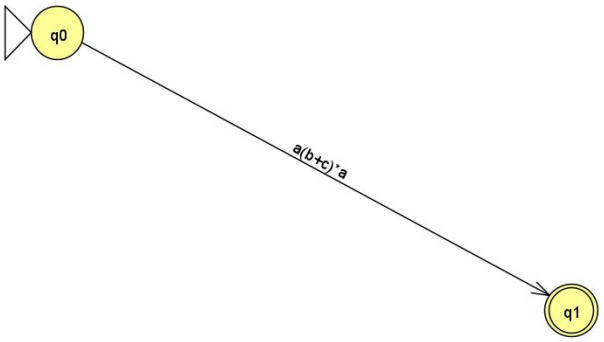


$$(a^*b(ab)^*aa)^*a^*b(ab)^*$$

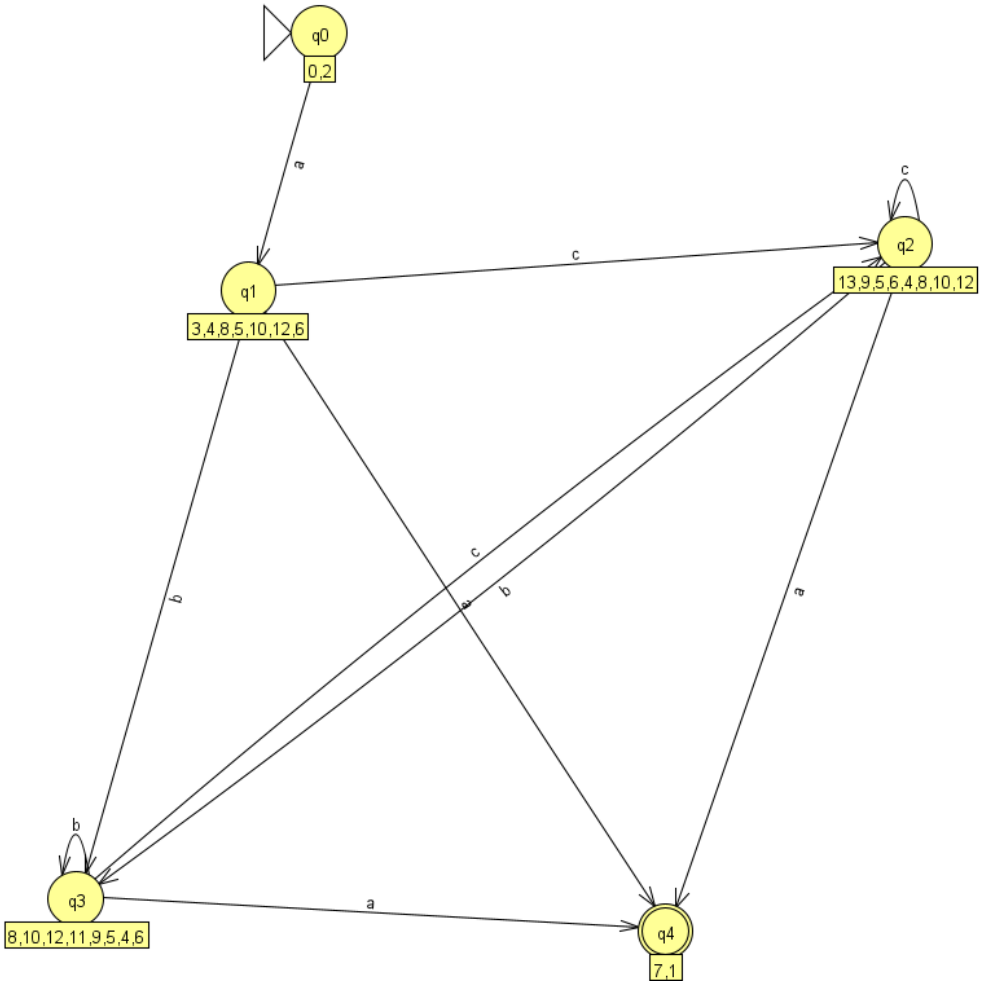
EXPERIMENT NO. 7

Problem : Convert a(b+c)*a to DFA. The string must start with an 'a' which is followed by a mix of b's and c's repeated in any order.

Solution : The NFA of given regular expression is given below :



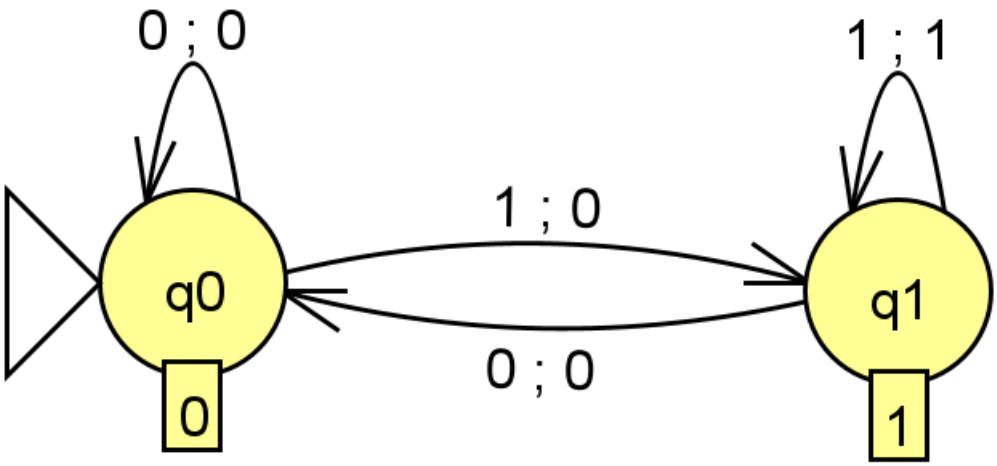
The DFA of given regular expression is given below :



EXPERIMENT NO. 8

Problem : Construct a Mealy machine which takes a binary number and replaces the first 1 with a 0 from every substring starting with 1. For example, 0001001110 becomes 0000000110.

Solution :



Input	Result
0111001	0011000
0001001110	0000000110
111010110	011000010
100010011100	000000001100