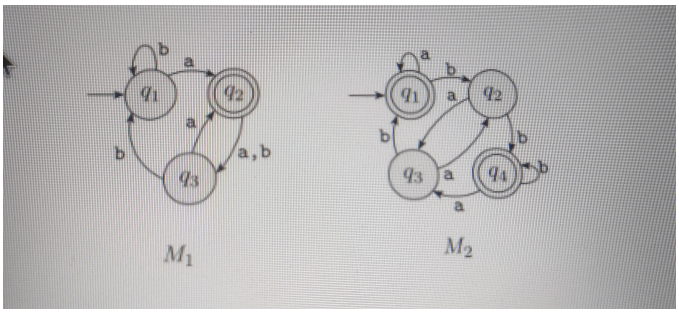
Assignment - 1

CS304

1.Describe in English the languages accepted by automata M1 and M2.



2.Draw DFAs for each of the languages given below. None of your DFAs may contain more than 4 states.

(a) All strings that do not end with aa.
(b) All strings that contain an even number of b's.
(c) All strings which do not contain the substring ba.

3. Give state diagram of DFAs recognizing the following languages. In all parts, the alphabet is 0, 1.

a. w : w begins with a 1 and ends with a 0
b. w : w has length at least 3 and its third symbol is a 0
c. w : w contains at least two 0s and at most one 1

4. Consider the following NFA. Convert it to an equivalent DFA using the studied method.

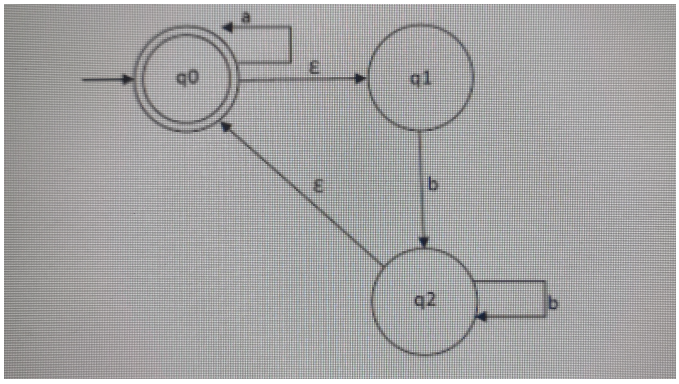


Figure 1: State diagram of NFA

5. In certain programming languages, comments appear between delimiters such as / # and #/. Let C be the language of all valid delimited comment strings. A member of C must begin with /# and end with #/ but have no intervening #/. For simplicity, assume that the alphabet for C is $\sum$ = {a, b, / ,#}. Give a DFA that recognizes C.

6. Design ϵ - NFA's for the following languages. Try to use ϵ transitions to simplify your design.

a. The set of strings consisting of zero or more a's followed by zero or more b's followed by zero or more b's
b. The set of strings that consist of either 01 repeated one or more times or 010 repeated one or more times.