## SOLUTIONS - EXERCISES ON NON-DETERMINISTIC FINITE AUTOMATA

1. Construct NFAs accepting the following languages.   Note: your machines must be truly non-deterministic and **have only the specified number of states**.

    a. the language on { 0, 1}:

    > L = { w | w is 11 or contains an even number of 0's (as well as some 1's) }

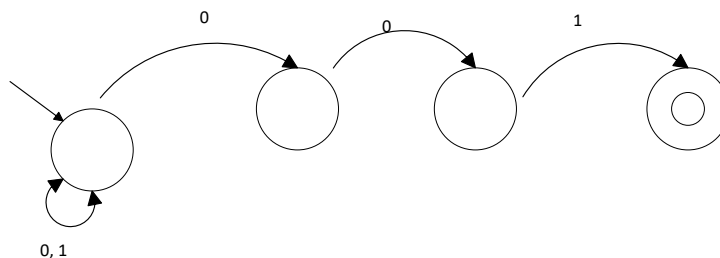   **with at most five states** for the language on {0, 1}. Hint: think RE to NFA construction
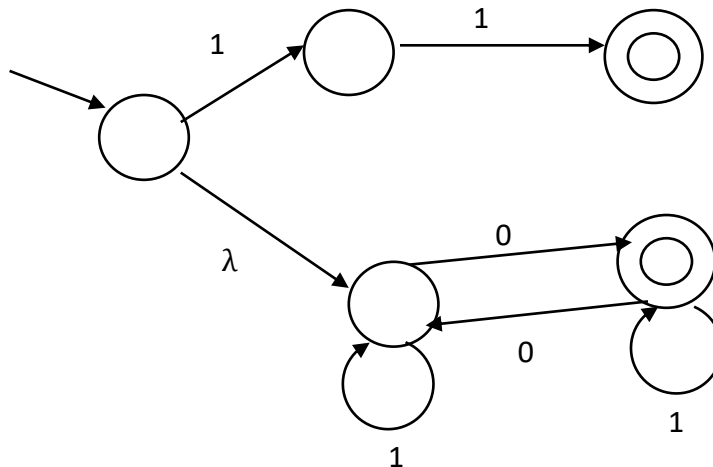
    b. the language on {0, 1}:

    > L = { w on {0, 1} | w finishes with 001 }

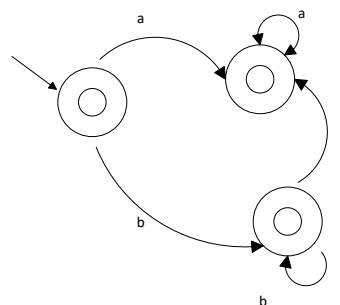   **with at most four states and no more than four edges**

    c. the language on { a, b}

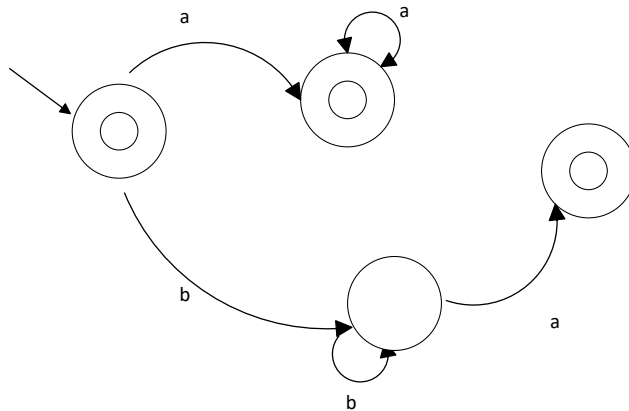   > L = { a^n : n ☐ 1} ∪ { $b^m a^k$: m ☐ 0, k ☐ 0]

    with exactly three states

d. The language on { a, b}

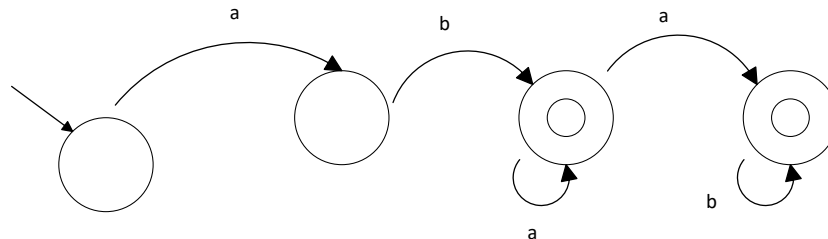$$L = \{ a^n : n \geq 0 \} \cup \{ b^n a : n \geq 1 \}$$
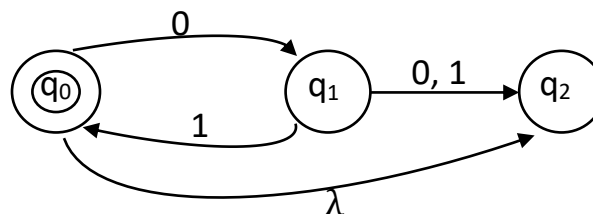
with exactly four states

e. The language on { a, b}

$$L = \{ abab^n : n \geq 0 \} \cup \{ aba^n : n \geq 0 \}$$

With no more than five states

2. What is the language accepted by the following NFA:

(01)*