EXERCISES ABOUT NON-DETERMINISTIC FINITE AUTOMATA WITH ε-TRANSITIONS (ε-NFAS)

1   Draw a ε-NFA for each language below:

a)   The set of strings consisting of 01 repeated one or more times or of 010 repeated one or more times.

b)   The set of binary strings such that at least one of the last 10 positions is a 1.

2   Consider the following ε-NFA:

	ε	a	b	c
→p	{q,r}	∅	{q}	{r}
Q	∅	{p}	{r}	{p,q}
*r	∅	∅	∅	{p}

a)   Show the closure-ε for each state.

b)   Show all the strings with length less or equal 3 accepted by the automaton.

c)   Convert the automaton to an equivalent DFA.

3   Give ε-NFAs the sets of strings correspondent to the following informal descriptions:

a)   The strings over {**a**,**b**} without more than 3 contiguous **a**'s.

b)   The strings over {**a**,**b**,**c**} with even length containing na even number of **c**'s.

4   Convert the following ε-NFA to a DFA.

	ε	a	b	c	d
→p	{r}	{p}	{q,s}	{p}	∅
*q	∅	{r}	{r}	{r}	{p,s}
r	{q}	{q,s}	∅	{p}	{p}
s	∅	{r}	{p}	∅	{q,r}