Formal Languages and Automata Theory, SS 2018. Homework 6 (due Week 7)

1. Consider the following ε-NFA:

	ε	a	b	c
$\rightarrow p$	$\emptyset$	$\{p\}$	$\{q\}$	$\{r\}$
q	$\{p\}$	$\{q\}$	$\{r\}$	$\emptyset$
$*r$	$\{q\}$	$\{r\}$	$\emptyset$	$\{p\}$

   (a) Compute the ε-closure of each state.

   (b) Give all strings of length three or less accepted by the automaton.

   (c) Convert the automaton to a DFA.

2. Repeat the previous exercise for the following ε-NFA.

	ε	a	b	c
$\rightarrow p$	$\{q,r\}$	$\emptyset$	$\{q\}$	$\{r\}$
q	$\emptyset$	$\{p\}$	$\{r\}$	$\{p,q\}$
$*r$	$\emptyset$	$\emptyset$	$\emptyset$	$\emptyset$

3. Design ε-NFAs 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 c's.

   (b) The set of strings that consist of either 01 repeated one or more times or 010 repeated zero or more times.