DETERMINISTIC FINITE AUTOMATA

16/10/2008

E2.1

EXERCISE 1

Give a DFA accepting the following language over the alphabet $\{a,b\}$: the set of all strings such that the second last symbol is b.

EXERCISE 2

Give a DFA accepting the following language over the alphabet $\{x,y\}$: the set of strings that either begin or end (or both) with yx.

EXERCISE 3

Give a DFA accepting the following language over the alphabet $\{0,1\}$: the set of strings such that the number of 0's is divisible by five and the number of 1's is divisible by three.

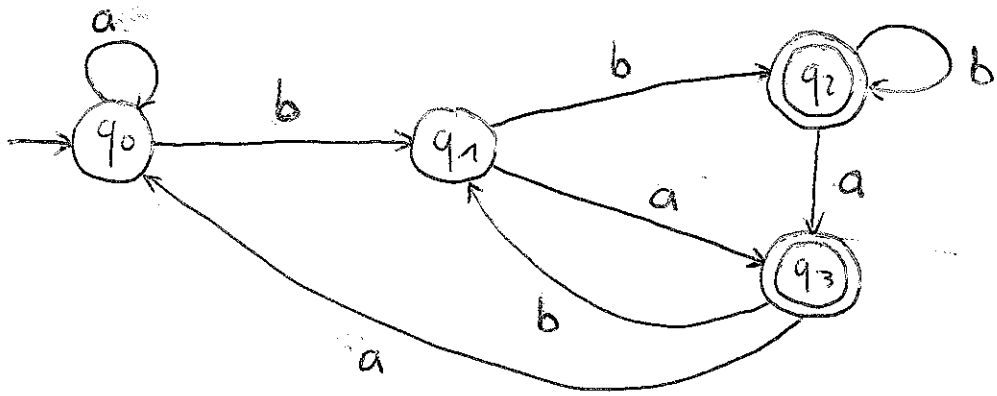
EXERCISE 4

Give a DFA accepting the following language over the alphabet $\{a,b,c,d\}$: 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.

SOLUTIONS (16/10/2008)

E2.2

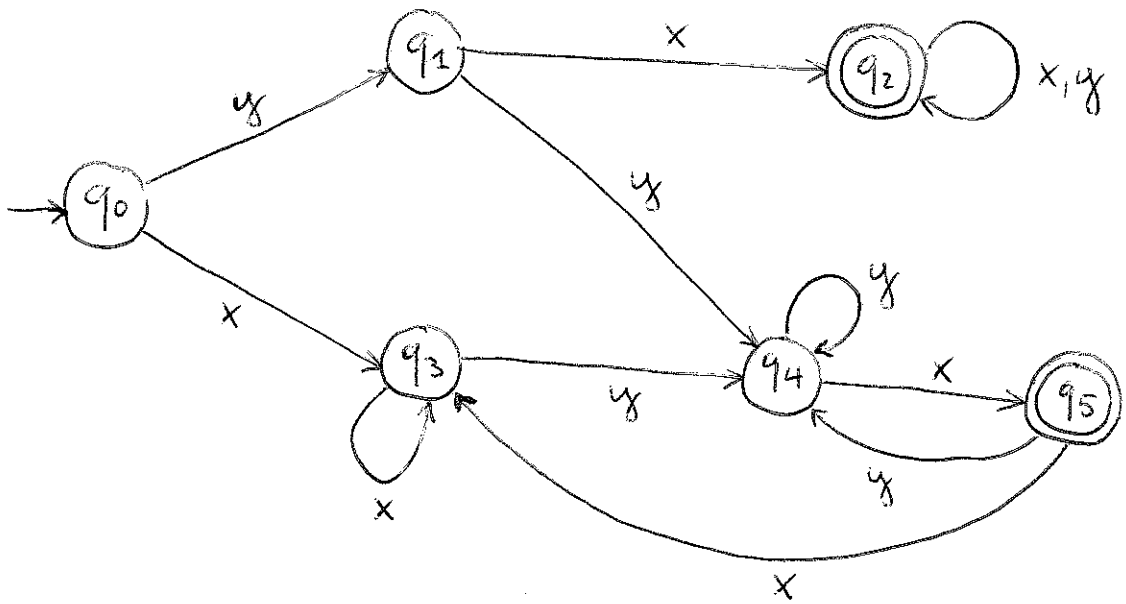
1) The DFA looks as follows:



We show that it accepts bbaaba but not abbbaa

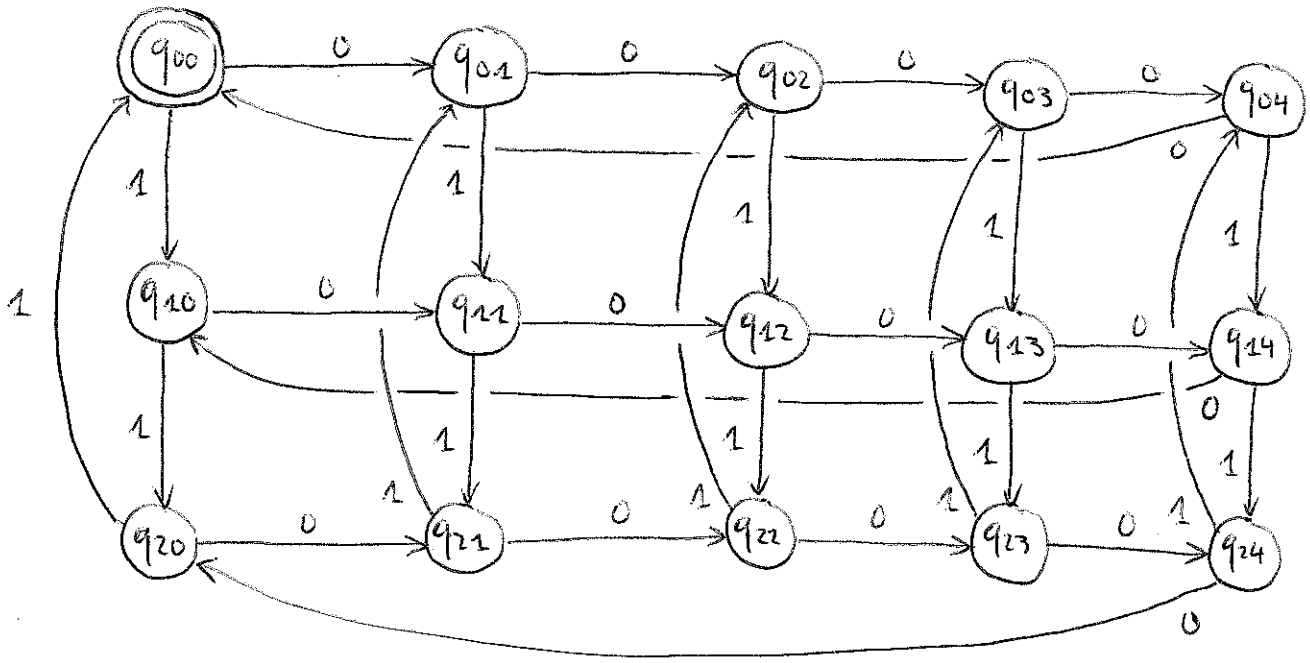
- $(q_0,b) \to q_1$, $(q_1,b) \to q_2$, $(q_2,a) \to q_3$, $(q_3,a) \to q_0$
  $(q_0,b) \to q_1$, $(q_1,a) \to q_2$ q_2 is a final state
- $(q_0,a) \to q_0$, $(q_0,b) \to q_1$, $(q_1,b) \to q_2$, $(q_2,b) \to q_2$
  $(q_2,a) \to q_3$, $(q_3,a) \to q_0$ q_0 is not a final state

2) The DFA looks as follows:



EZ.3

3) The DFA looks as follows:



4) The DFA looks as follows: