Problem

Read the informal definition of the finite state transducer given in Exercise 1.24. Give the state diagram of an FST with the following behavior. Its input and output alphabets are {0,1}. Its output string is identical to the input string on the even positions but inverted on the odd positions. For example, on input 0000111 it should output 1010010.

Step-by-step solution

Step 1 of 2

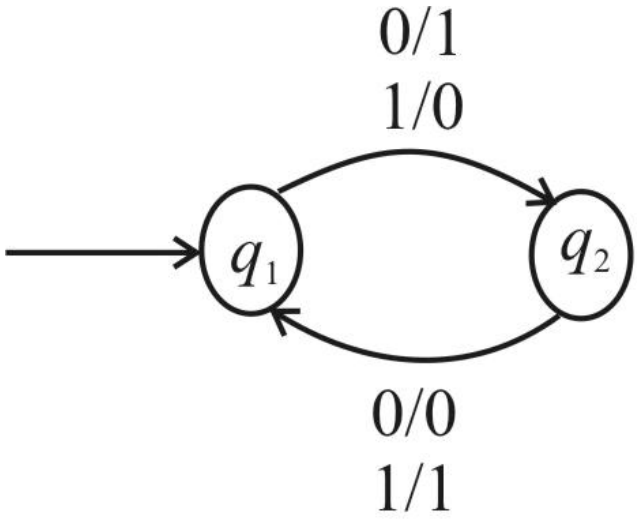
Given input and output alphabets for FST are $\{0,1\}$.

FST has the following behavior

• Its output string is identical to the input string on the even positions.

• Its output string is inverted on the odd positions.

So the state diagram of that FST is given as follows:



Comment

Step 2 of 2

So by this state diagram,

• In even positions output string is same as input string

i.e. for input $0 \rightarrow$ output is also 0

for input $1 \rightarrow$ output is also 1

• In odd positions, out string is inverted

i.e. for input $0 \rightarrow$ output is 1

for input $1 \rightarrow$ output is 0.

Comment