CS 301 Lab Week 2 Solutions

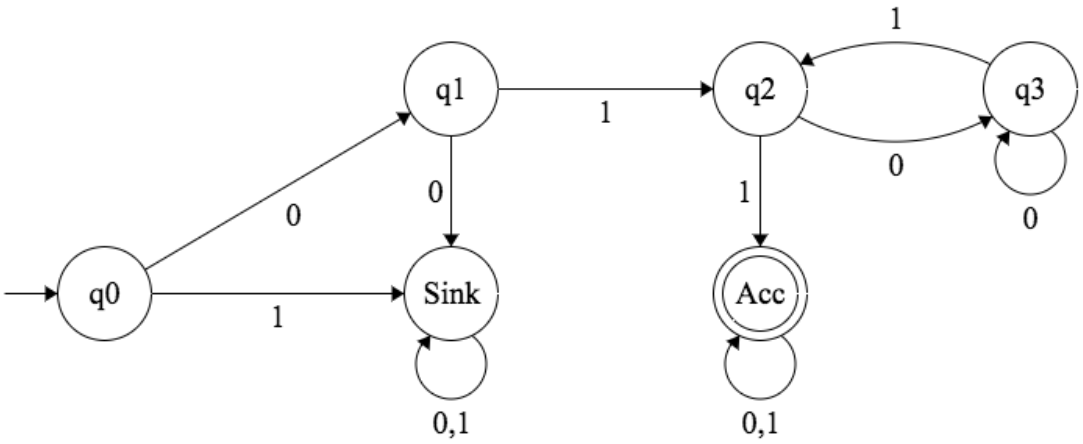
1 Languages

a) Using set and string operations, give a definition of a language of binary strings which ends in 111 or does not contain 010

$$L = \Sigma^* 111 \cup \overline{\Sigma^* 010 \Sigma^*}$$

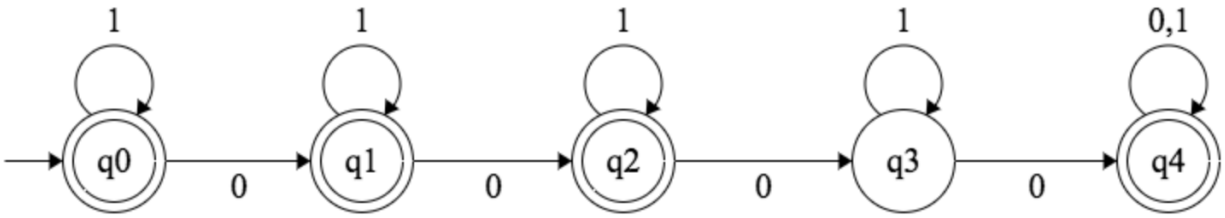
2 DFA Construction

Create a DFA which recognizes the language of all binary strings which start with '01' and contain '11'



3 DFAs

Consider the following DFA M.



a) What is the 5-tuple which represents this DFA?

Q ={q0,q1,q2,q3,q4}

Σ ={0,1}

q_0 =q0

F ={q0,q1,q2,q4}

$\delta =$

	0	1
q0	q1	q0
q1	q2	q1
q2	q3	q2
q3	q4	q3
q4	q4	q4

b) What language does this DFA decide?

M decides the language of all binary strings that do not have exactly 3 zeroes in them.

c) What is the sequence of states that M goes through on input 01100? Is it accepted or rejected?

q0,q1,q1,q1,q2,q3 -- rejected