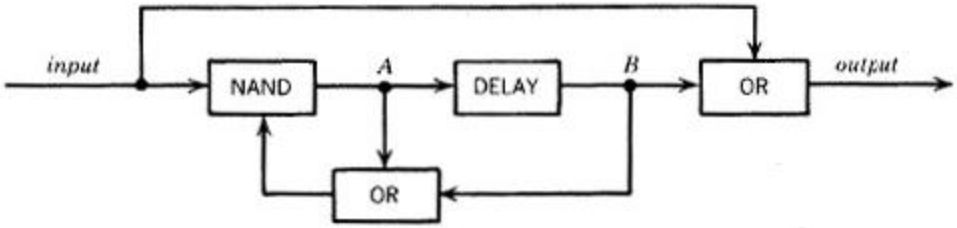
CSC 2204 Finite Automata Theory and Formal Languages

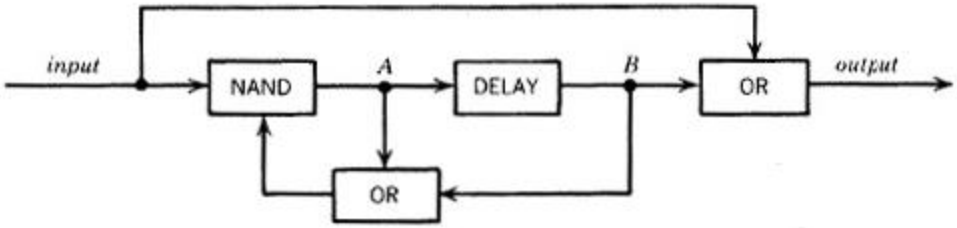
Department of Computer Science
SZABIST (Islamabad Campus)

Week 9 (Week 2)

Example 2

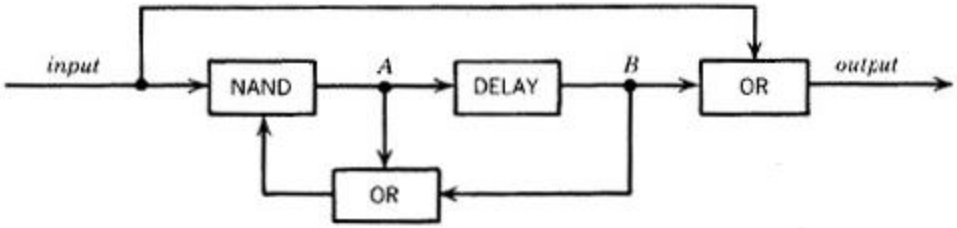


Example 2



q_0 is $A = 0$, $B = 0$
q_1 is $A = 0$, $B = 1$
q_2 is $A = 1$, $B = 0$
q_3 is $A = 1$, $B = 1$

Example 2



q_0 is $A = 0$, $B = 0$
q_1 is $A = 0$, $B = 1$
q_2 is $A = 1$, $B = 0$
q_3 is $A = 1$, $B = 1$

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A
New A = (input) NAND (old A OR old B)
Output = (input) OR (old B)

Example 2

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A

New A = (input) NAND (old A OR old B)

Output = (input) OR (old B)

Example 2

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A

New A = (input) NAND (old A OR old B)

Output = (input) OR (old B)

Suppose we are in state q_0 and we receive the input 0:

New B = old A = 0

New A = (input) NAND (old A OR old B)
= (0) NAND (0 OR 0)
= 0 NAND 0
= 1

Output = 0 OR 0 = 0

The new state is q_2 (because new A = 1, new B = 0).

Example 2

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A

New A = (input) NAND (old A OR old B)

Output = (input) OR (old B)

Suppose we are in state q_0 and we receive the input 0:

New B = old A = 0

New A = (input) NAND (old A OR old B)
= (0) NAND (0 OR 0)
= 0 NAND 0
= 1

Output = 0 OR 0 = 0

The new state is q_2 (because new A = 1, new B = 0).

If we are in state q_0 and we receive the input 1,

New B = old A = 0

New A = 1 NAND (0 OR 0) = 1

Output = 1 OR 0 = 1

The new state is q_2 (because the new A = 1 and the new B = 0).

Example 2

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A

New A = (input) NAND (old A OR old B)

Output = (input) OR (old B)

If we are in q_1 and we receive the input 0:

New B = old A = 0

New A = 0 NAND (0 OR 1) = 1

Output = 0 OR 1 = 1

The new state is q_2.

Example 2

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A

New A = (input) NAND (old A OR old B)

Output = (input) OR (old B)

If we are in q_1 and we receive the input 0:

New B = old A = 0

New A = 0 NAND (0 OR 1) = 1

Output = 0 OR 1 = 1

The new state is q_2.

If we are in q_1 and we receive the input 1,

New B = old A = 0

New A = 1 NAND (0 OR 1) = 0

Output = 1 OR 1 = 1

The new state is q_1

Example 2

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A

New A = (input) NAND (old A OR old B)

Output = (input) OR (old B)

If we are in state q_2 and we receive the input 0,

New B = old A = 1

New A = 0 NAND (1 OR 0) = 1

Output = 0 OR 0= 0

The new state is q_3.

Example 2

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A

New A = (input) NAND (old A OR old B)

Output = (input) OR (old B)

If we are in state q_2 and we receive the input 0,

New B = old A = 1

New A = 0 NAND (1 OR 0) = 1

Output = 0 OR 0 = 0

The new state is q_3.

If we are in q_2 and we receive the input 1,

New B = old A = 1

New A = 1 NAND (1 OR 0) = 0

Output = 1 OR 0 = 1

The new state is q_1

Example 2

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A

New A = (input) NAND (old A OR old B)

Output = (input) OR (old B)

If we are in q_3 and we receive the input 0,

New B = old A = 1

New A = 0 NAND (1 OR 1) = 1

Output = 0 OR 1 = 1

The new state is q_3

Example 2

The operation of this circuit is such that after an input of 0 or 1, the state changes according to the following rules:

New B = old A

New A = (input) NAND (old A OR old B)

Output = (input) OR (old B)

If we are in q_3 and we receive the input 0,

New B = old A = 1

New A = 0 NAND (1 OR 1) = 1

Output = 0 OR 1 = 1

The new state is q_3

If we are in q_3 and we receive the input 1,

New B = old A = 1

New A = 1 NAND (1 OR 1) = 0

Output = 1 OR 1 = 1

The new state is q_1.

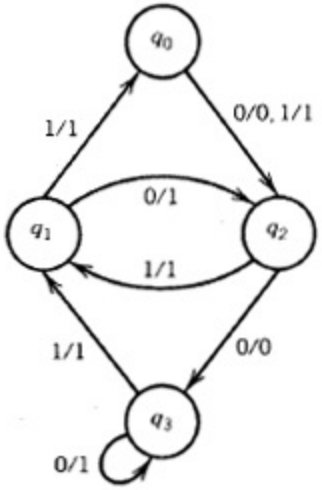
Example 2

Old State	After Input 0		After Input 1	
	New State	Output	New State	Output
q_0	q_2	0	q_2	1
q_1	q_2	1	q_0	1
q_2	q_3	0	q_1	1
q_3	q_3	1	q_1	1

Example 2

Old State	After Input 0		After Input 1	
	New State	Output	New State	Output
q_0	q_2	0	q_2	1
q_1	q_2	1	q_0	1
q_2	q_3	0	q_1	1
q_3	q_3	1	q_1	1

input string 011011



Example 2

Old State	After Input 0		After Input 1	
	New State	Output	New State	Output
q_0	q_2	0	q_2	1
q_1	q_2	1	q_0	1
q_2	q_3	0	q_1	1
q_3	q_3	1	q_1	1

input string 011011
output sequence 111011