Hasan Mutlu – 1801042673 – Lab 4

1.)

States and register states table:

States	R0	R1
S0	0	0
S1	0	1
S2	1	0
S3	1	1

R0 and R1 are register states, N0 and N1 are register inputs.

States	R0	R1	a	b		x	N0	N1
S0	0	0	0	0		0	0	0
	0	0	0	1		0	0	0
	0	0	1	0		0	0	1
	0	0	1	1		0	0	0
S1	0	1	0	0		0	0	0
	0	1	0	1		0	0	0
	0	1	1	0		0	1	1
	0	1	1	1		0	1	0
S2	1	0	0	0		1	1	0
	1	0	0	1		1	1	1
	1	0	1	0		1	0	0
	1	0	1	1		1	1	0
S3	1	1	0	0		1	0	0
	1	1	0	1		1	1	1
	1	1	1	0		1	0	0
	1	1	1	1		1	1	1

2.)

X = R0

N0 = R0’.R1.ab’ + R0’.R1.ab + R0.R1’.ab + R0.R1’.ab’ + R0.R1’.ab + R0.R1.a’b + R0.R1.ab

N1 = R0’.R1’.ab’ + R0’.R1.ab’ + R0.R1’.a’b + R0.R1.a’b + R0.R1.ab

N0 Karnaugh Map:

	a.b				
R0.R1		00	01	11	10
	00	0	0	0	0
	01	0	1	1	0
	11	0	1	1	0
	10	1	1	1	0

N0 = R1.b + R0.b + R0.R1’.a’

N1 Karnaugh Map:

	a.b				
R0.R1		00	01	11	10
	00	0	0	0	1
	01	0	0	0	1
	11	0	1	1	0
	10	0	1	0	0

N1 = R0.a’b + R0.R1.b + R0’.ab’