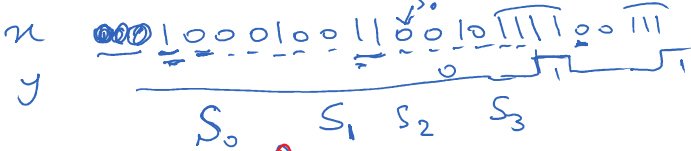
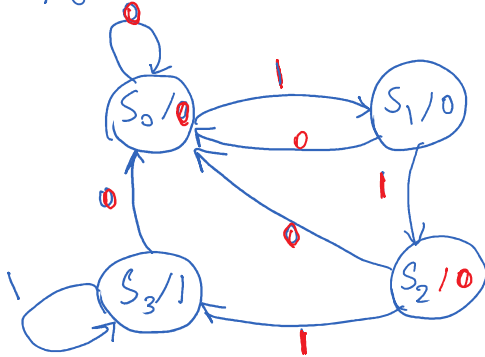


می‌خواهیم مداری طراحی کنیم که به کمک آن سه 1 (و یا بیشتر) متوالی در یک رشته بیتی وارده از طریق یک خط ورودی شناسایی شوند. نمودار حالت مدار در شکل ۵-۲۴ نشان داده شده است. این



کد باینری

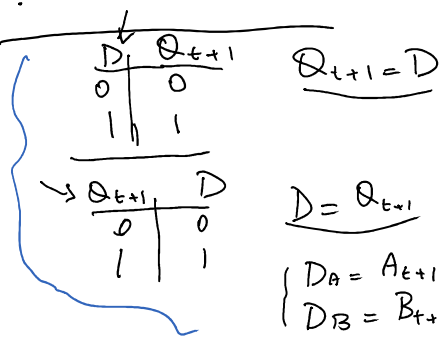
S_0	00
S_1	01
S_2	10
S_3	11
	A B



حالت فعلی	ورودی	حالت بعدی	خروجی
A_t, B_t	x	A_{t+1}, B_{t+1}	y
$S_0 \{ 00 \}$	0	00	0
	1	01	0
$S_1 \{ 01 \}$	0	00	0
	1	10	0
$S_2 \{ 10 \}$	0	00	0
	1	11	1
$S_3 \{ 11 \}$	0	00	0
	1	11	1

حالت بعدی

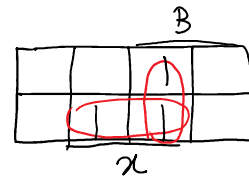
با فلیپ فلوپ D طراحی را انجام می‌دهیم



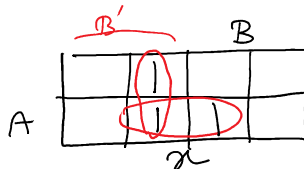
A_{t+1}	B_{t+1}	x	D_A	D_B	y
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	0	0	0
0	1	1	0	0	0
1	0	0	0	0	0
1	0	1	1	0	0
1	1	0	0	0	0
1	1	1	1	1	1

$$D_A = \sum (3, 5, 7)$$

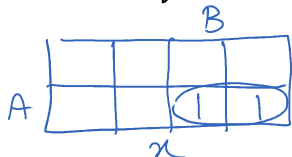
$$D_B = \sum (1, 5, 7)$$



$$D_A = Ax + Bx \leftarrow (A+B)x$$

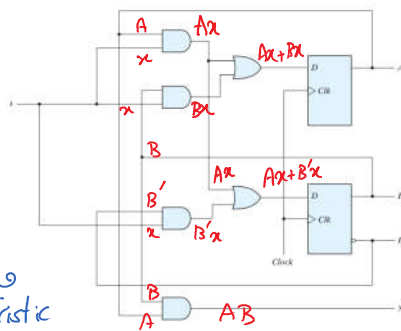


$$D_B = Ax + B'x \leftarrow (A+B')x$$



$$y = AB$$





Handwritten matrix operations for the Gauss-Jordan method:

Matrix 1 (Circled):

J	K	Q_{t+1}
0	0	Q_t
0	1	0
1	1	0
1	1	Q_t

Matrix 2:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 3:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 4:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 5:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 6:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 7:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 8:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 9:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 10:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 11:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 12:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 13:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 14:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 15:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 16:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 17:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 18:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 19:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 20:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 21:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 22:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 23:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 24:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 25:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 26:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 27:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 28:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 29:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 30:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 31:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 32:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 33:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 34:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 35:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 36:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 37:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 38:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 39:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 40:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 41:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 42:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 43:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 44:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 45:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 46:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 47:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 48:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 49:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 50:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 51:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 52:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 53:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 54:

Q_t	Q_{t+1}	J	K
0	0	?	?
0	1	?	?
0	0	?	?
1	0	?	?
1	1	?	?

Matrix 55:

Q_t	Q_{t+1}	J	K
0	0	?	?</

Characteristic Table

ک، ع در قبی با استفاد از JK FF

↓

Q_t	Q_{t+1}	J	K
0	0	0, 0	1, 0
0	1	1, 1	0, 1
1	0	0, 1	1, 1
1	1	1, 0	0, 0

Q_t	Q_{t+1}	J	K
0	0	0	X
0	1	1	X
1	0	X	1
1	1	X	0

حل مثال ٢

	Q_t	Q_{t+1}	J	K
	<u>0</u>	<u>0</u>	0	X
→	0	1	1	X
→	1	0	X	1
→	1	1	X	0

↓ ↓ ↓ Excitation Table

↓ A_t	↓ B_t	χ	↓ A_{t+1}	↓ B_{t+1}	y	↓ J_A	↓ K_A	↓ J_B	↓ K_B
0	0	0	0	0	0	0	X	0	X
0	0	1	0	1	0	0	X	1	X
0	1	0	0	0	0	0	X	X	1
0	1	1	1	0	0	1	X	X	1
1	0	0	0	0	0	X	1	0	X
1	0	1	1	1	0	X	0	1	X
1	1	0	0	0	1	X	1	X	1
1	1	1	1	1	1	X	0	X	0

↓ ↓ ↓

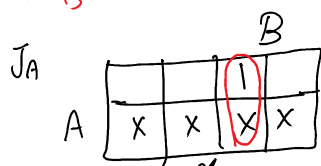
$$y = \sum (6, 7)$$

$$J_A = \sum (3), \quad \sum (4, 5, 6, 7)$$

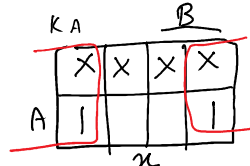
$$J_A = \sum (1, 2, 3) \quad \text{and} \quad \sum (10, 1, 2, 3) \leftarrow$$

$$K_A = \sum (4, 6) \quad \sum (2, 3, 6, 7)$$

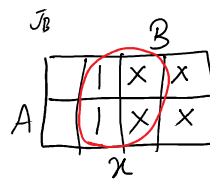
$$K_B = \sum (2, 3, 6) \text{ d. } \sum (0, 1, 4, 5)$$



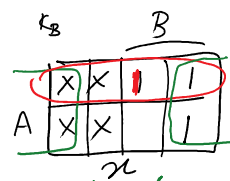
$$J_A = Bx$$



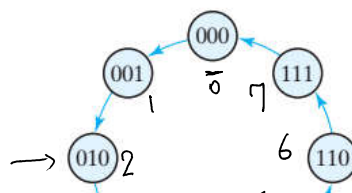
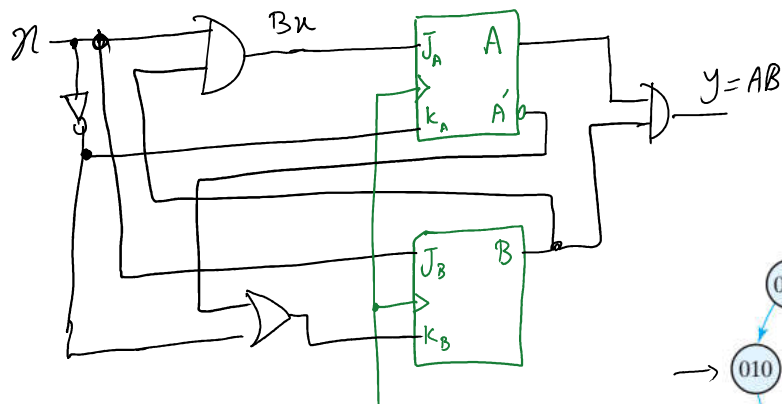
$$K_A = x'$$

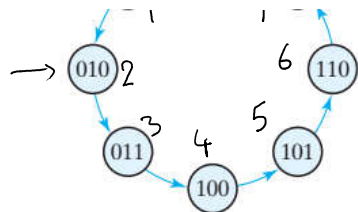
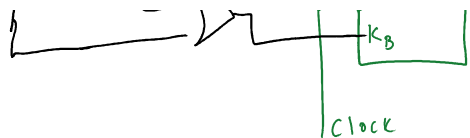


$$\bar{J}_B = \kappa$$



$$K_B = \overbrace{x' + A'}^x = (Ax)'$$





شماره
Counter

حالت فعلی

	A_2	A_1	A_0
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1

حالت بعدی

	A_2	A_1	A_0
0	0	0	1
1	0	1	0
2	0	1	1
3	1	0	0
4	1	0	1
5	1	1	0
6	1	1	1
7	0	0	0

فرکانس

	T_{A_2}	T_{A_1}	T_{A_0}
0	0	0	1
1	0	1	1
2	0	0	1
3	1	0	1
4	0	0	1
5	0	0	1
6	0	1	1
7	1	1	1

State Table

جدول تغییرات

T	Q_{t+1}
0	Q_t
1	Q_t'

جدول تغییرات

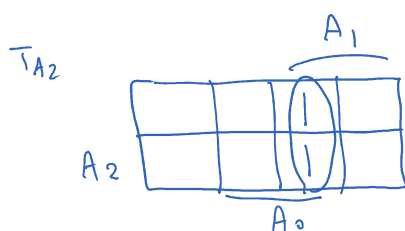
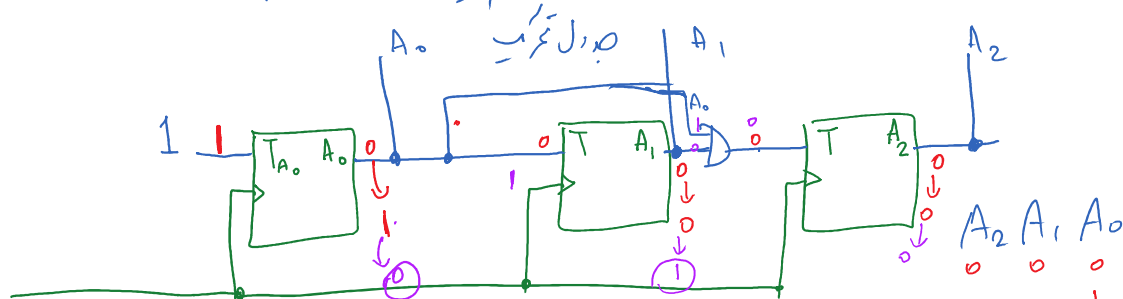
Q_t	Q_{t+1}	T
0	0	0
0	1	1
1	0	1
1	1	0

$$T_{A_2} = \sum (3, 7)$$

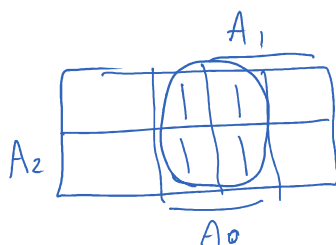
$$T_{A_1} = \sum (1, 3, 5, 7)$$

$$T_{A_0} = 1$$

$A_2 A_1 A_0$



$$T_{A_2} = A_1 A_0$$



$$T_{A_1} = A_0$$

$$T_{A_0} = 1$$