Recall the Present-State-Next-State Table constructed in Step 2.

Present State	A	B	Input X		Next State	A	B	Output Z
0	0	0	0		0	0	0	0
	0	0	1		1	0	1	0
1	0	1	0		3	1	1	1
	0	1	1		2	1	0	0
2	1	0	0		0	0	0	1
	1	0	1		1	0	1	0
3	1	1	0		2	1	0	1
	1	1	1		0	0	0	1

Present-State-Next-State Table

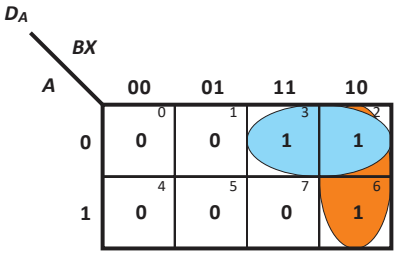
Add input control signals for D and JK Flip-Flops.

Present State	A	B	Input X		Next State	A	B	Output Z		D_A	D_B		J_A	K_A	J_B	K_B
0	0	0	0		0	0	0	0		0	0		**0**	**x**	**0**	**x**
	0	0	1		1	0	1	0		0	1		**0**	**x**	**1**	**x**
1	0	1	0		3	1	1	1		1	1		**1**	**x**	**x**	**0**
	0	1	1		2	1	0	0		1	0		**1**	**x**	**x**	**1**
2	1	0	0		0	0	0	1		0	0		**x**	**1**	**0**	**x**
	1	0	1		1	0	1	0		0	1		**x**	**1**	**1**	**x**
3	1	1	0		2	1	0	1		1	0		**x**	**0**	**x**	**1**
	1	1	1		0	0	0	1		0	0		**x**	**1**	**x**	**1**

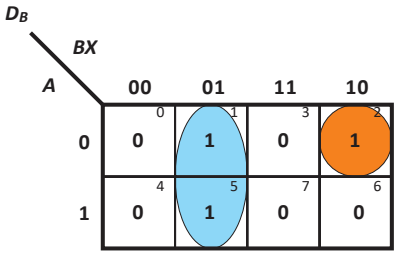
Next-State Decoder

$Q(t)$	$\rightarrow$	$Q(t+1)$	J	K
0		**0**	**0**	**x**
0		**1**	**1**	**x**
1		**0**	**x**	**1**
1		**1**	**x**	**0**

JK Excitation Table

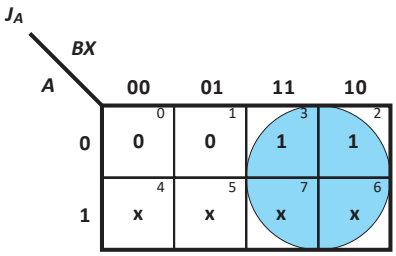


$$D_A = \overline{A}B + B\overline{X}$$

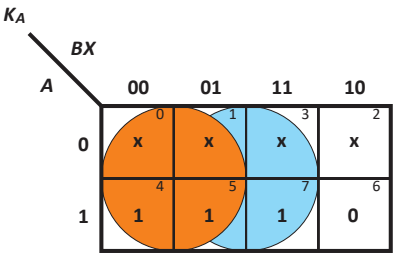


$$D_B = \overline{B}X + \overline{A}B\overline{X}$$

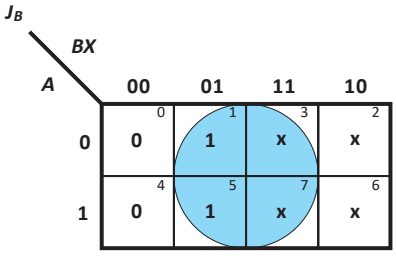
Count the cost: 5 2-input gates; 1 3-input gate



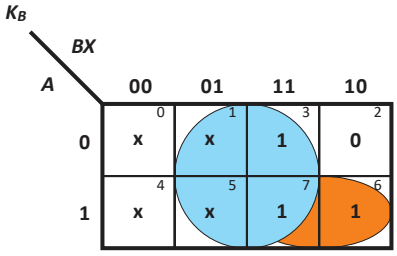
$$J_A = B$$



$$K_A = \overline{B} + X$$



$$J_B = X$$



$$K_B = X + AB$$

Count the cost: 3 2-input gates
Choose the JK Flip-Flop implementation