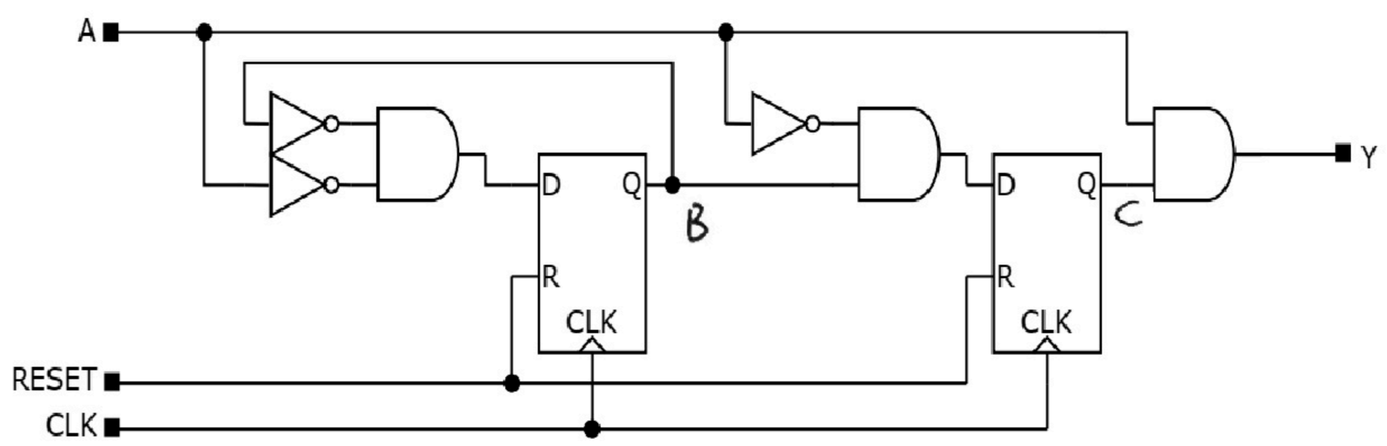
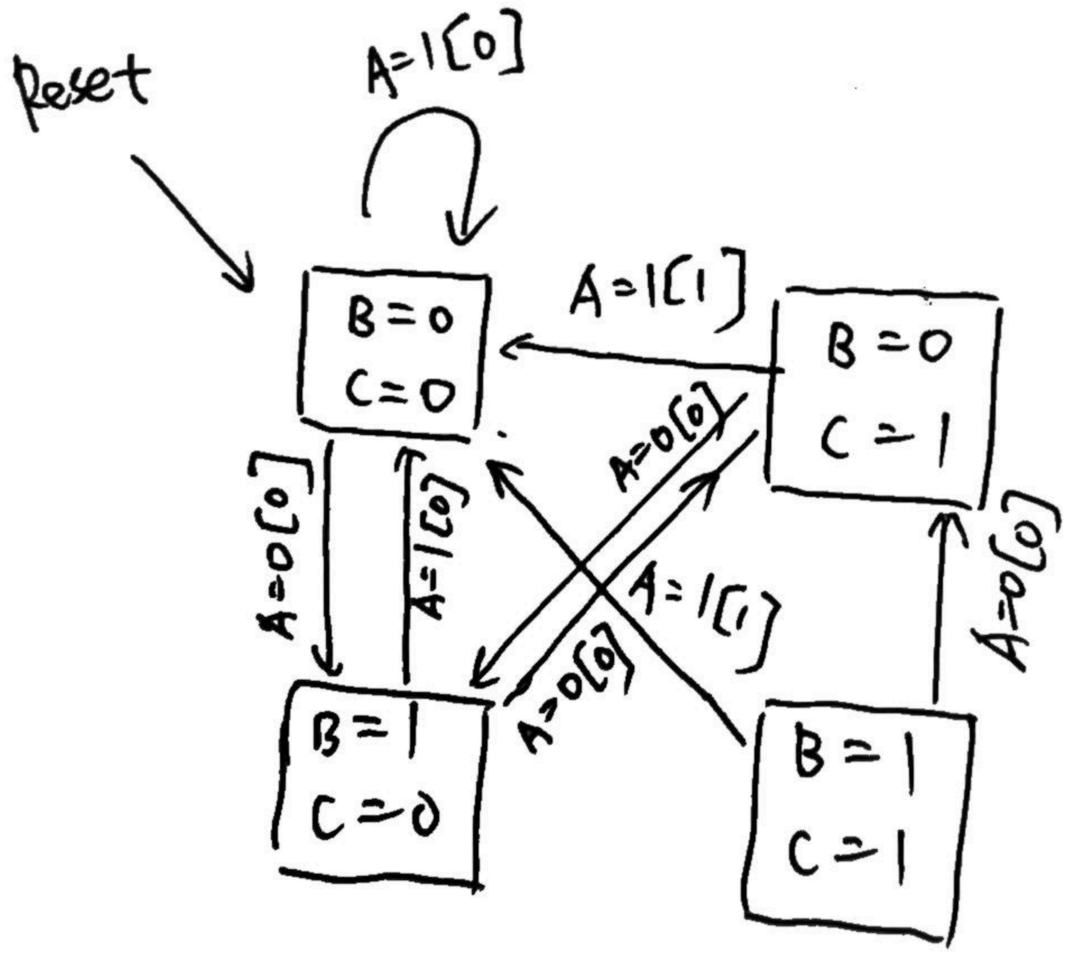
A1.



A	B	C	B′	C′	Y
0	0	0	1	0	0
0	0	1	1	0	0
0	1	0	0	1	0
0	1	1	0	1	0
1	0	0	0	0	0
1	0	1	0	0	1
1	1	0	0	0	0
1	1	1	0	0	1



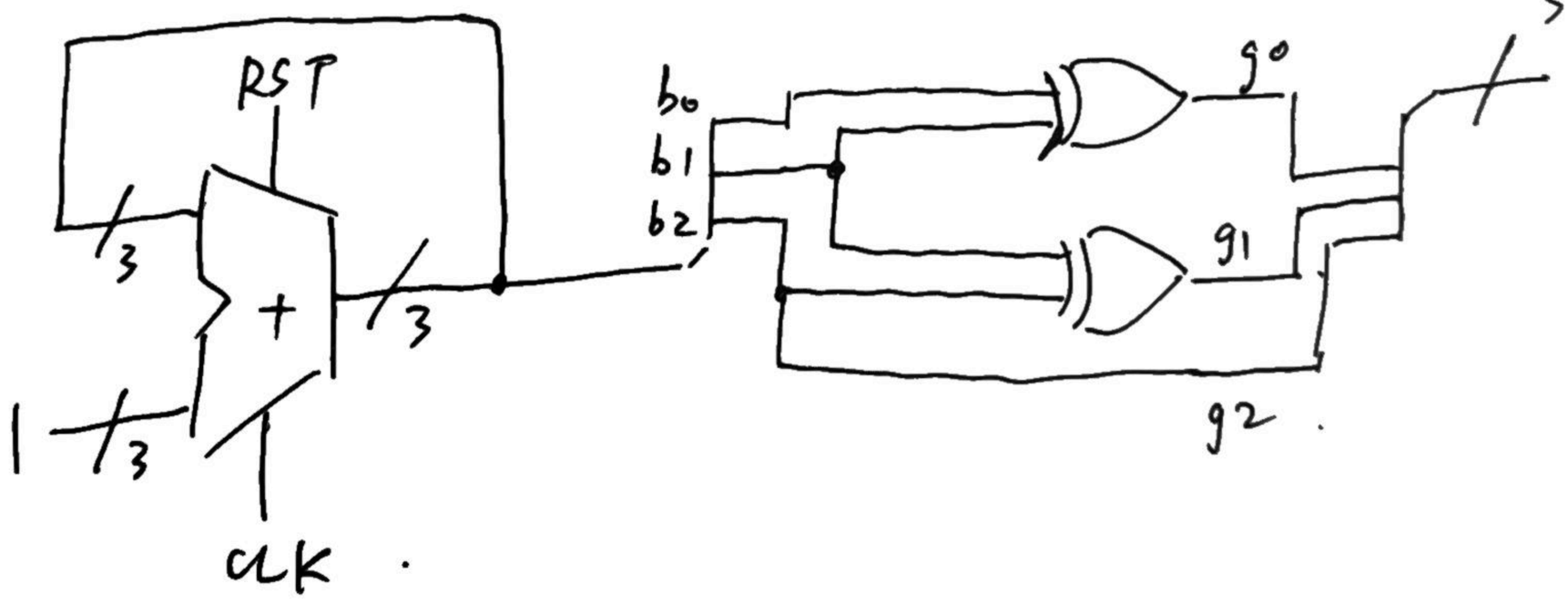
When A is 1 :
it goes to state 00,
only when A is 1 at
state 01 :
output is 1 .

when port A gets the
pattern of 0-0-1.
output will be 1.
So. it's pattern detactor.

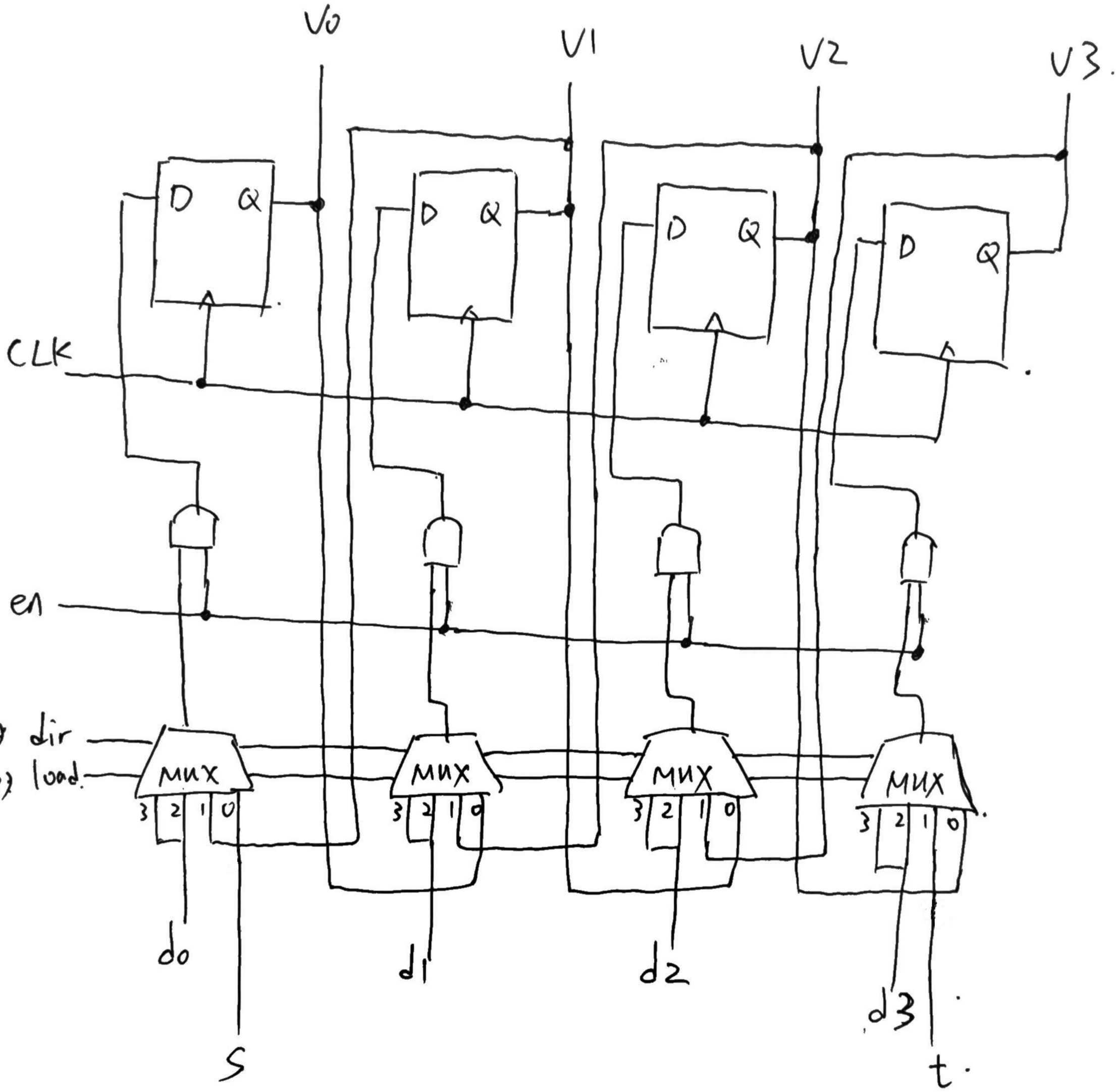
A2 :

Binary Code.			Gray Code		
b2	b1	b0	g2	g1	g0
0	0	0	0	0	0
0	0	1	0	0	1
0	1	0	0	1	1
0	1	1	0	1	0
1	0	0	1	1	0
1	0	1	1	1	1
1	1	0	1	0	1
1	1	1	1	0	0

$$\begin{cases} g_2 = b_2 \\ g_1 = b_1 \oplus b_2 \\ g_0 = b_0 \oplus b_1 \end{cases}$$



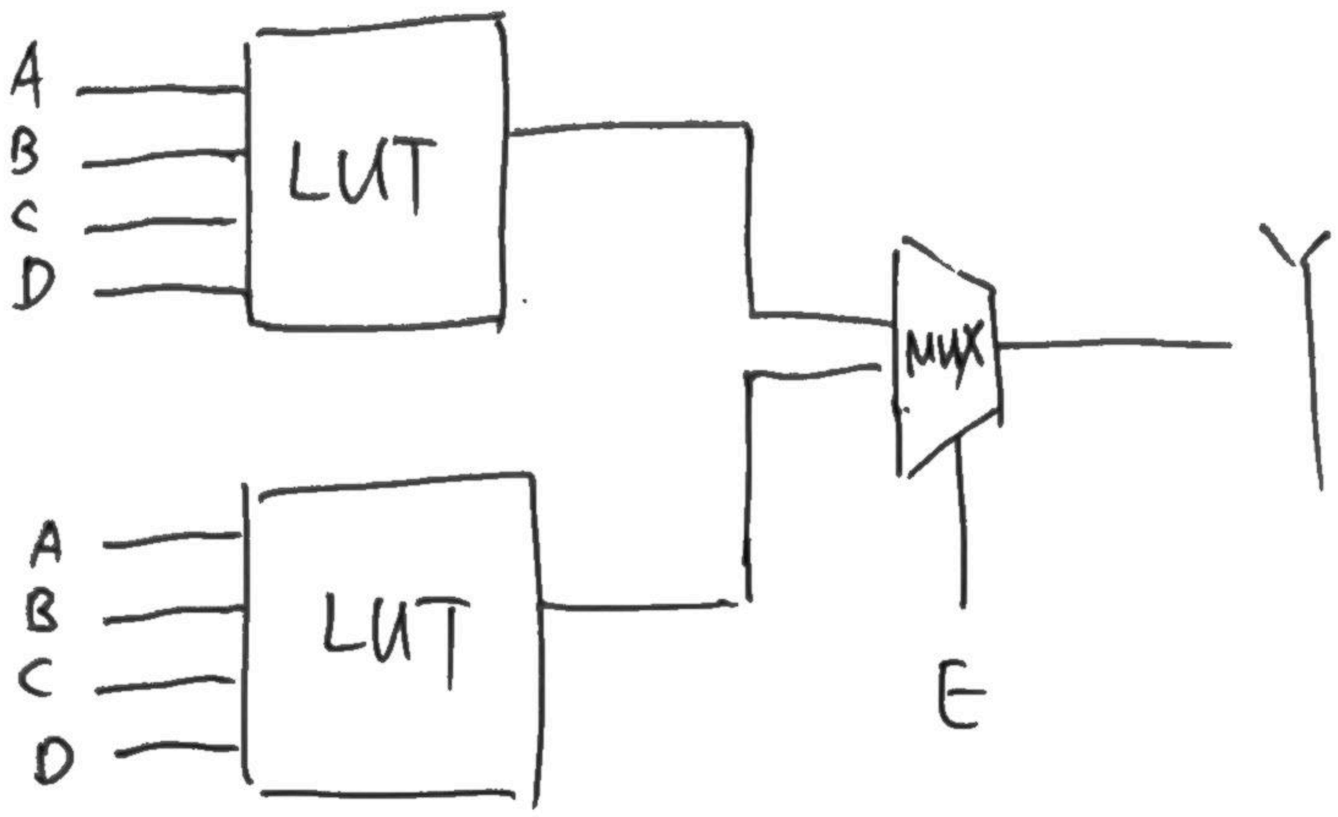
A3 :

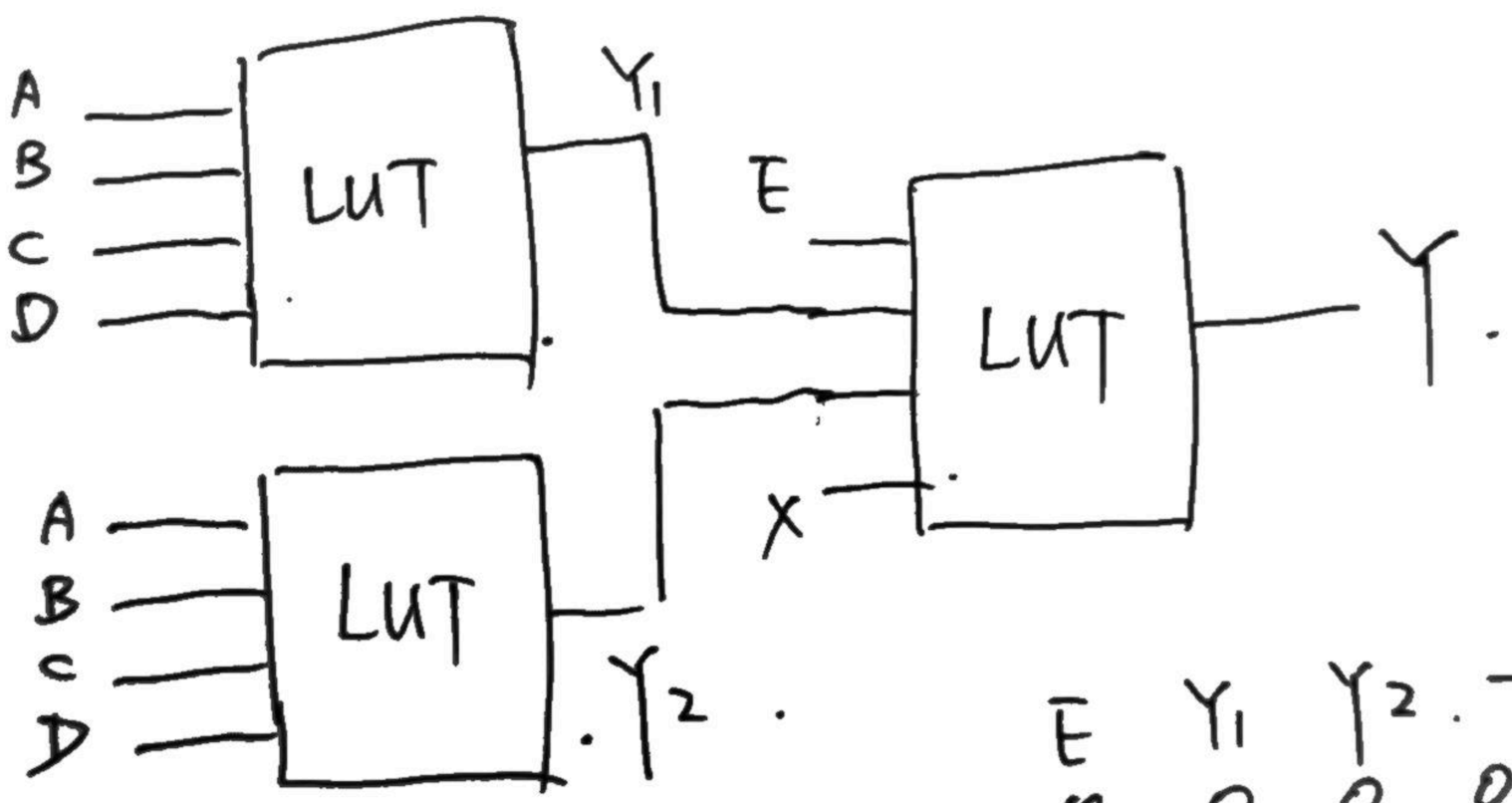


A4.1

	$\bar{A}BC\bar{D} + A\bar{B}C\bar{D}$	$(A+\bar{B})(C+D)$	$AB \oplus (C+D)$
0 0 0 0	0	0	0
0 0 0 1	0	1	1
0 0 1 0	0	1	1
0 0 1 1	0	1	1
0 1 0 0	0	0	0
0 1 0 1	0	0	1
0 1 1 0	0	0	1
0 1 1 1	1	0	1
1 0 0 0	0	0	0
1 0 0 1	0	1	1
1 0 1 0	1	1	1
1 0 1 1	0	1	1
1 1 0 0	0	0	0
1 1 0 1	0	1	1
1 1 1 0	0	1	0
1 1 1 1	0	1	0

A 4.2





E	Y_1	Y_2	—	Y
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

when E=0:

$Y = Y_1$.

when E=1:

$Y = Y_2$.